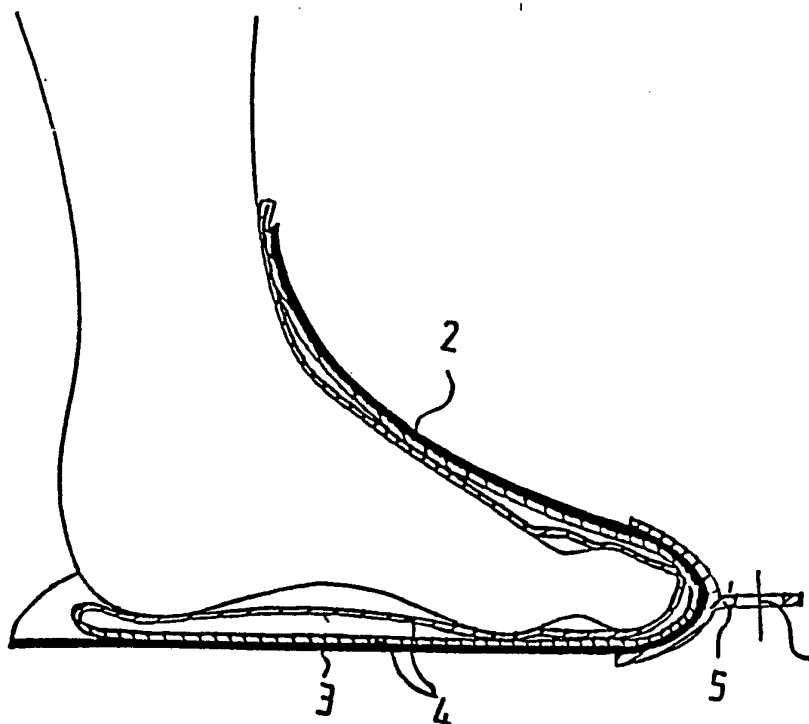




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(54) Title: MEANS FOR PUTTING ON THERAPEUTIC ELASTIC STOCKINGS



(57) Abstract

The means for putting on therapeutic elastic stockings consists of a sock of smooth material to cover the foot, the sock being provided with a lining of smooth and supple material. The lining has been partly attached to the sock, partly set free from it, the free part at the end being closed and having such a length that it can be taken out as far as outside the sock and can be turned in up to the toe of the sock, a situation that takes place when the sock is positioned round the foot of the user. Besides the lining is characterized by the fact that it is attached to the sock where the foot steps in and that the length of the free part of the lining is substantially equal to the length of the sock.

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Title : Means for putting on therapeutic
5 elastic stockings.

The present invention refers to a means for
putting on therapeutic elastic stockings,
containing a sock of smooth material to cover
the foot.

10 Therapeutic elastic stockings, also called support
stockings, are amongst others worn by sufferers
from varicose veins or crural ulcers or in case of
injuries such as contusions or sprains. The
dimensions of such stockings have been chosen in
15 such a way that the stockings, after putting them
on, will have been stretched in circumferential
direction, so that they apply a normal pressure
upon the skin.

The stocking being put on, this normal pressure is
20 still enlarged as a result of the elasticity in
pulling direction taking place at the same time,
especially on those places where the stockings is
pulled over vaultings of the foot, such as the
heel.

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The power necessary for putting on the stocking,
being proportionate to the prevailing normal
pressure and the coefficient of friction between
the stocking and the foot, is therefore rather
5 large.

Putting on this stocking, to lower the
friction between the therapeutic elastic stocking
and the foot it is known, in order to make things
easier, to use special socklets made of a smooth
10 fabric. These socklets cover the foot at the
upperside up to the instep and at the underside up
to the heel and at the same time protect the
stockings, being put on, against damage by toe-
nails.

15 In order to cover the legs of the user with
normal stockings or a panty and to wear shoes,
after putting on the therapeutic elastic stockings
the socklet is removed by pulling it or by pulling
a tab attached to it. To this end the therapeutic
20 elastic stocking has an open toe allowing the
socklet to be pulled off.

As one pulls off a normal sock, this goes without any effort by taking this sock at the upper edge and stripping it off the foot or by putting one's hand between the upper edge of the sock and the leg and stretching the sock a little bit in radial direction and then pushing it off the foot. Because the upper edge of the means as described above, after putting on the therapeutic elastic stocking, is covered by said stocking, these actions cannot be practised here. Removing the means can only be effected by pulling its toe-part.

In this case on the one side the means is strongly subjected to the traction power, so that it should be made of firm slightly elastic material, while on the other hand, removing it, the friction with the stocking as well as with the foot has to be overcome.

As besides the socklet sticks to the usually by perspiration damp foot, removing the means makes a rather great demand on a person's power. The pulling power is smallest when it is applied parallel to the foot, but many users are functionally limited to such a degree that they are not able to pull off the socklet parallel to the foot.

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Usually they will pull the socklet or the tab attached to it towards themselves, such demanding a considerably greater effort. Besides the known socklets are of a rather stiff material, so that, especially when the therapeutic elastic stocking moves along the heel, it still costs a fairly great effort to pull this stocking over the foot while putting it on.

It is the object of the present invention to provide a means for putting on the therapeutic elastic stockings demanding considerably less power than the already known means to put on these stockings and to remove the means.

According to the invention this is obtained by providing the sock with a lining of supple and smooth material, which lining being partly attached to the sock and partly set free from it, the free part being closed at the end and having such a length that it can be taken out as far as outside the sock and will be turned inside the sock up to its toe when the sock is positioned round the foot of the user.

When the means, after putting on the therapeutic elastic stocking, is removed now by pulling the sock or the tab attached to it, the lining is turned outside again being stripped as it were
5 along itself.

In this way there is no frictional contact between the foot and the means. The only friction-resistance felt at the removing of the means is the little friction of the material of the lining
10 against itself and the friction of the outer surface of the sock along the side of the therapeutic elastic stocking.

The lining is preferably made of a thin fabric, a so-called non-woven fabric or a film of a
15 thermoplastic synthetic material, such as a polyalkene. Some materials may present difficulties as they strongly stick to damp(perspiring) surfaces, making them hard to be moved along a somewhat damp skin.

20 Because according to the invention the lining of the means, however, does not slip along the skin while removing the means, but strips along itself, this objection is not present in this case.

Moreover the friction resistance of the materials moving along each other during the "stripping" , can be reduced by using a synthetic material, having a non blocking agent added to it,
5 for example hydrotalcite.

The material used for the sock pulled over by the therapeutic elastic stocking is preferably a fabric coated with polytetrafluorethylene (teflon), such as a nylon fabric or a fibreglass cloth.
10 Such a fibreglass cloth coated with teflon is commercially available from Eriks b.v. under the tradename "Chemglass PTFE fibreglass fabric 100-3". Such a material has a very low coefficient of friction and is strongly non blocking and resistant
15 to atmospheric conditions and sunlight. Moreover it is strong enough to resist without worth mentioning elasticity the tensile stress taking place as the sock is being pulled off.

The invention will further be elucidated with
20 reference to the embodiment shown in the drawings. Here shows :

Fig.1 in longitudinal section a means
according to the invention ;

Fig.2 a top view of the means as shown in
Fig.1 ;

Fig.3 a longitudinal section of the means
after putting it on ;

5 and

Fig.4 a longitudinal section of the means
when it is pulled off.

The means 1 as shown in the drawings has the
shape of a slipper, the upper part 2 of it
10 stretching beyond the instep and the bottom or
solepart 3 finding itself round the heel of
the user. The means is made of a fabric coated
with teflon, such as a nylon fabric or a
fibreglass cloth. Attached to the open end of
15 the slipper is a lining 4, made of a thin
material such as a polyethylene film. The
lining extends from this end to the toe of the
slipper at the one end and beyond the slipper
at the other end. The part of the lining
20 inside the slipper can be connected with the
slipper all over its own length.

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Attached to the other end is tab 5, provided with an eye 6. The tab can be made of any firm material such as leather or a string of a strong synthetic material.

5 Before the slipper is put on, lining 4 is turned in, as to be seen in Fig.3. After the slipper has been put on, the therapeutic elastic stocking 7 is pulled over the slipper. Because the coefficient of friction of the
10 slipper coated with teflon is low, relatively little power is required to put on the therapeutic elastic stocking.

 After putting on the therapeutic elastic stocking means 1 has to be removed in order to
15 enable the user to put on normal stockings or a panty on top of the therapeutic elastic stockings and to wear shoes.

 As shown in Fig.4 for this purpose tab 5 is being pulled, so that the means will be
20 removed from the therapeutic elastic stocking by way of the open toe.

Because the lining 4, being pulled off like this, is stripped along itself now, no friction with the skin of the foot takes place, so that little pulling power is necessary and irritation of the skin by materials moving along it does not take place. It is true, friction takes place between the means and the therapeutic elastic stocking and between the materials of the lining moving along each other, but because of the low coefficient of friction of the tefloncoating of the slipper and the low friction-resistance as the synthetic materials move along each other, the needed pulling power is restricted.

The working of a means made of a known cotton fabric and the working of a means according to the invention were experimentally compared.

Using the cotton socklet and using the means according to the invention, either way the power required for putting on the therapeutic elastic stocking could not be measured objectively indeed, but seemed considerably less when using the means according to the invention.

The power necessary to pull off the cotton socklet, after putting on the therapeutic elastic stocking, could be measured and appeared to be at least 1,5 times larger than the power needed to pull off the means according to the invention.

The invention is not limited to the example as described above.

Thus the lining with the open end can be attached to the slipper there where the foot steps in and for the remaining part can be loose.

In this case the sock and the lining can consist of the same suitable material, such as a fibreglass cloth coated with teflon or nylon.

CLAIMS :

1. Means for putting on therapeutic elastic stockings, containing a sock of smooth material to cover the foot, characterized by the fact that the sock is provided with a lining of supple and smooth material, which lining being partly attached to the sock and partly set free from it, the free part being closed at the end and having such a length that it can be taken out as far as outside the sock and is turned inside the sock up to the toe of it when the sock is positioned round the foot of the user.
2. Means according to claim 1, wherein the lining has been attached to the sock where the foot steps in and the length of the free part of the lining is substantially equal to the length of the sock.
3. Means according to claim 1 or 2, wherein the sock and the lining are made of the same supple and smooth material, such as a fabric coated with polytetrafluorethylene.

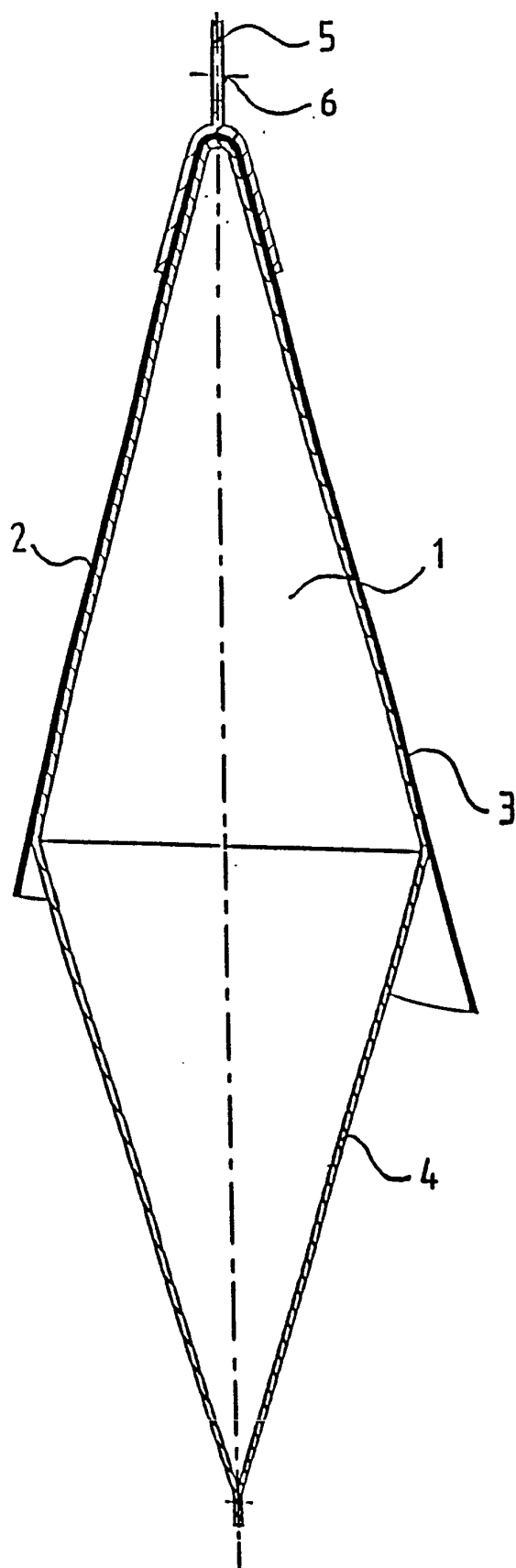
4. Means according to claim 1 or 2, wherein the lining is made of a thin fabric, a so-called non woven fabric or a film of a thermoplastic synthetic material.

5 5. Means according to claim 4, wherein the fabric the lining is made of, is a nylon fabric.

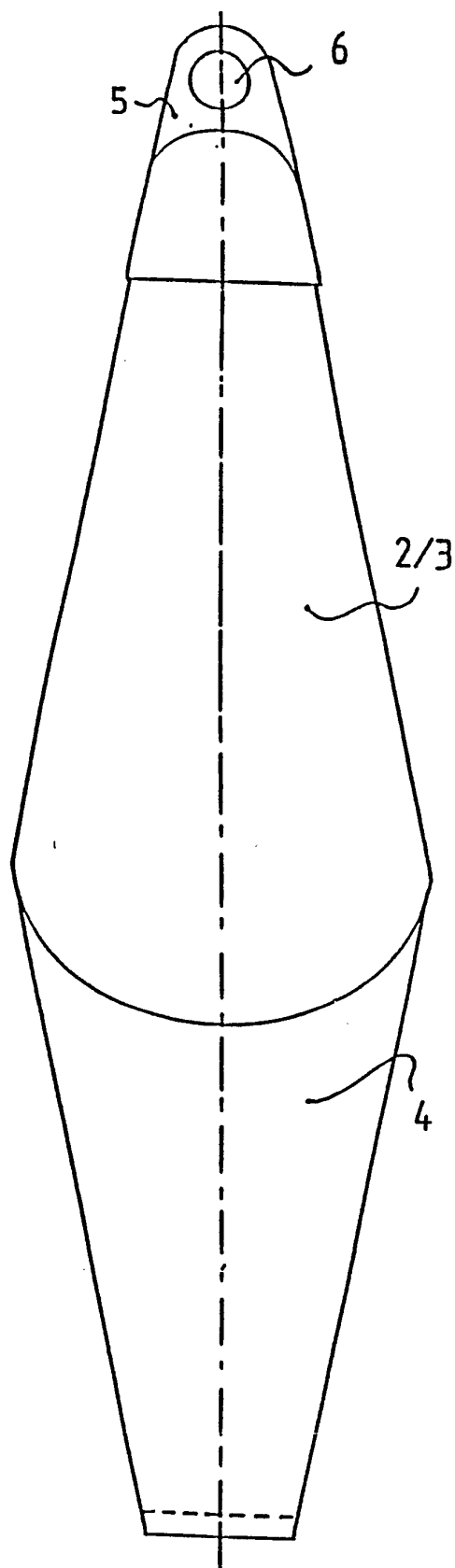
6. Means according to claim 4, wherein a non blocking agent has been added to the thermoplastic synthetic material of the lining.

10 7. Means according to claim 1 or 2, wherein the sock is made of a fabric coated with polytetrafluorethylene.

8. Means according to claim 7, wherein the fabric coated with polytetrafluorethylene is a fibreglass
15 cloth.

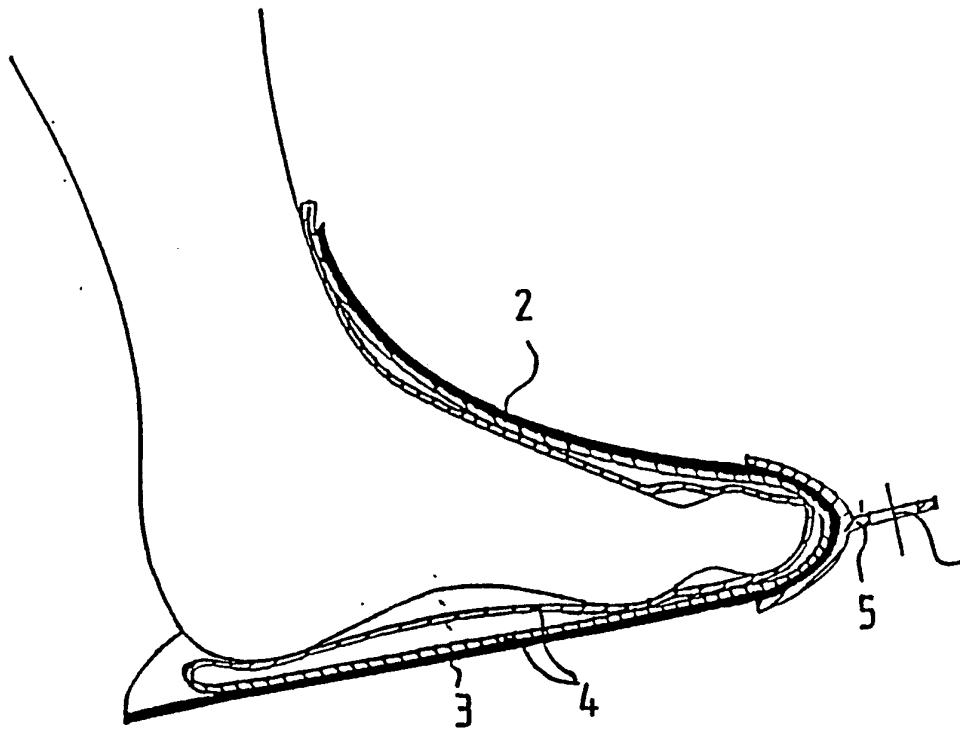


FIGUUR 1

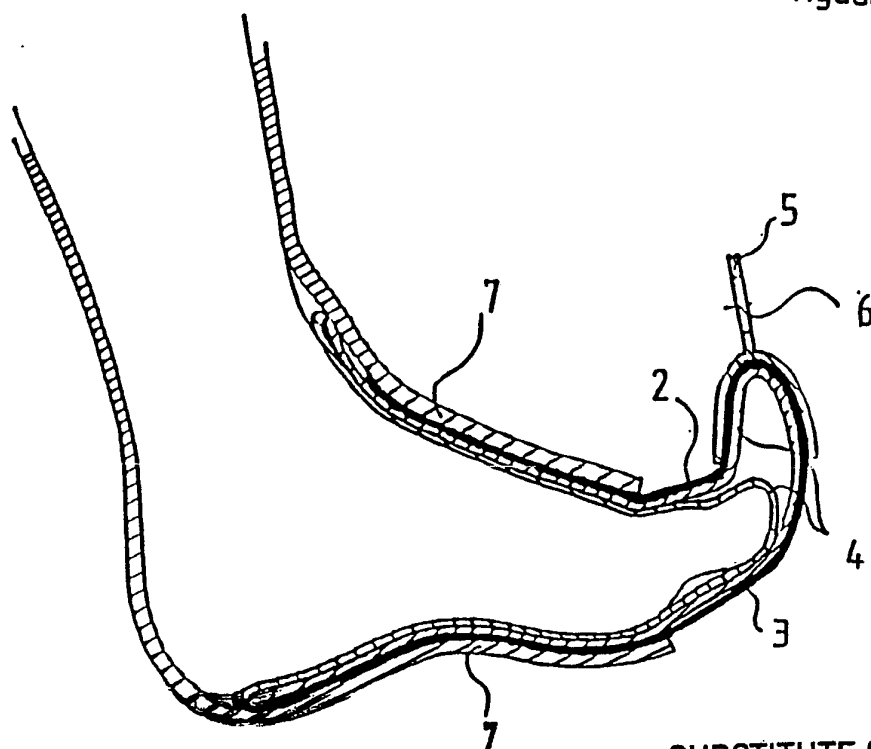


FIGUUR 2

figuur 3



figuur 4



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INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 90/00148

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 A47G25/90		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl. 5	A47G ; A61F	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	FR,A,788477 (ETABLISSEMENTS BOUDIOS) 10 October 1935 see the whole document	1
A	DE,C,478051 (KÖRTING) 26 June 1929 see the whole document	1
<p>¹⁰ Special categories of cited documents :</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
23 JANUARY 1991	- 7 FEB 1991	
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**ANNEX TO THE INTERNATIONAL SEARCH REPORT
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A-788477		None	
DE-C-478051		None	