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(71) Applicant: **Cerjak, Janko**
8280 Brestanica (SI)

(72) Inventor: **Sernel, Tina**
1000 Ljubljana (SI)

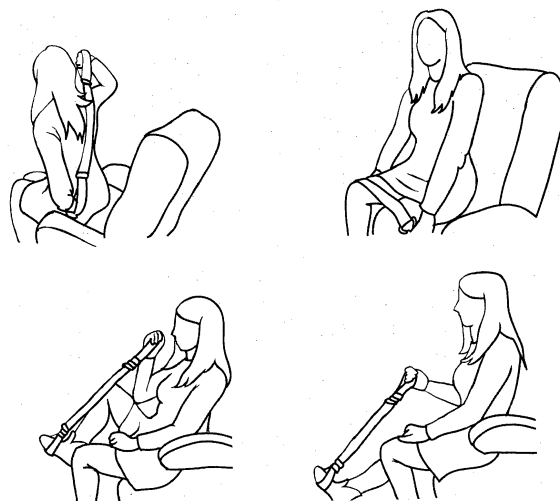
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(54) **STRETCHING DEVICE**

(57) The invented stretching device comprises two handholds, ring-shaped extendable elastic band, and two linking elements, preferably in the form of an ellipsoidal ring.

The invented device is engineered so that it enables exercising in the vertical direction. It includes two loop-shaped handholds which are easy to hold with hands or support with leg thus ensuring safe exercising. The stretching device enables numerous exercises in the sitting position and activates the least active groups of muscles during sitting. The invented device is structurally robust, made of natural material, and easy to carry due to its low weight. The attachment with ellipsoidal rings is safer than other state of the art attachments of handholds to an elastic element, e.g. when sewn on latex. The advantage of this attachment is that good flexibility of these handholds is ensured in the sphere of action.



Slika 4

Description

FIELD OF THE INVENTION

[0001] The present invention relates to muscle stretching device which is designed to enable the performance of physiotherapeutical exercises to maintain and strengthen the body movement by stretching muscles of individual parts of the body.

BACKGROUND OF THE INVENTION

[0002] Traveling by air, car and train, particularly over long distances, expose passengers to strains that may have a negative effect on their health and well-being. The most uncomfortable are long flights. The changing air-pressure and humidity in an air cabin together with hours of stillness due to sitting increase health risk especially to passengers who are not in the best shape.

[0003] Contraction of muscles is an important factor in helping to keep blood flowing through the veins, particularly in the legs. Prolonged immobility, especially when seated, can lead to pooling of blood in the legs, which in turn may cause swelling, stiffness, and discomfort. Risk groups of travellers are exposed to forming blood clots and deep vein thrombosis (DVT). It would be easy to prevent such conditions by walking around but moving around the airplane cabin and other vehicles is usually limited, or even prohibited. Unexpected turbulence and speed changes can pose a safety risk or, moreover, even injuries to air travellers walking around.

[0004] To reduce the risks of long-hour sitting, a doctor may prescribe compression stockings which gently squeeze muscles of the leg and improve the flow of blood in the deep veins. The problem is that travellers buy them in a hurry, without consulting the doctor thus failing to comply with proper sizing.

[0005] Much better and easier solution to the problem is to use the invented stretching device when sitting.

[0006] The market offers numerous devices for establishing, maintaining and strengthening movement capabilities and activating individual groups of muscles. There are some well-known simple expanders in the form of extendable bands. Some of them are made up of only one extendable elastic band in a tube which is installed between two handholds. There are also state of the art devices which are composed of elastic expanding part to which two straps/handholds are attached on both ends. This elastic expanding part comprises either more parallel springs which are mounted on gripping handles or latex bands. For stretching groups of muscles, there are state of the art machines which require more space. Stretching exercises usually take place in the standing position while moving arms and legs horizontally and vertically. State of the art devices, however face various weaknesses, i.e. straps/handholds fail to offer a good grasp. Moreover, the sizes of the mentioned devices are not adapted to the height of the user thus failing to provide

optimal exercising results. Straps/handholds are often too loosely attached to elastic parts thus jeopardising the safety of the user.

[0007] The invented stretching device eliminates the mentioned disadvantages. The said device comprises two loop-shaped handholds which are easy for hands to grab and offer firm leg support thus ensuring safe exercising. The invented device is made of natural materials which cannot injure the skin of the person exercising. It is structurally robust and easy to carry due to its low weight. Preferably, it consists of an elastic band with a certain coefficient of expansion. The band is extendable; its both ends are connected which makes it easy to mount the handholds. Both handholds are attached to the mentioned elastic band by links - the invented ellipsoidal rings. The advantage of this attachment is that good flexibility of the handholds is ensured in the sphere of action. The attachment with ellipsoidal rings is generally safer than other state of the art attachments of handholds to an elastic element, e.g. when sewn on latex. To do stretching exercises with the invented device, no additional space is needed either horizontally or vertically. The stretching device enables numerous exercises in the sitting position and accelerates blood circulation of the least active groups of muscles during sitting.

[0008] Further advantages and benefits of the invention will become apparent to an average-skilled professional from the attached descriptions and drawings:

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

Figure 1: Top-down view of the invented stretching device

Figure 2: Side view of the invented stretching device

Figure 3: The attaching ellipsoidal ring

Figure 4: Stretching exercises with the invented device

[0010] The invented stretching device 1 comprises two handholds 4, extendable elastic band 10, and two linking elements, preferably in the form of an ellipsoidal ring 12. The handholds 4 are preferably made of cotton - the material which is resistant to wear, hard to break and generally non-elastic. The surface structure of handholds cannot damage the skin. The handholds 4 have the shape of the strip 6 of the width of 45 mm. Both end handholds are loop-shaped as shown in Drawing 1. A sling 26 at the end of the handhold 4 allows attachment with the elastic band 10. The sling is connected with a joint 8 which firmly connects the upper 20 and lower 22 part of the loop. Between these parts there is room for the ellipsoidal ring 12 to be inserted. The handhold 4 is

loop-shaped at the far end 24 to offer support for arms and legs. The loop ends are also connected with a joint 8 which firmly connects the upper 20 and lower 23 part of the loop. When using the stretching device 1, we place our leg or arm into the mentioned loop 24.

[0011] The handholds 4 are of different lengths. The length of handholds, measured between two extreme points, varies from 180 to 250 mm. We offer the stretching device of different lengths of handholds 4 to adapt it to the height of users.

[0012] The stretching device 1 also includes a linking element in the form of an ellipsoidal ring 12. This linking element offers various advantages over other well-known versions of handholds mounted to elastic elements. It enables flexible mounting and simple replacement of handhold 4. The ellipsoidal ring 12 is made of either steel or similar having approximately round profile, 5.8 mm in diameter, and appropriate strength to withstand horizontal forces which develop during stretching the extendable elastic band 10. The ring 12 has at any position on the periphery a segment opening of any length as shown in Figure 3. Said ring opening is preferably tightly closed by a rotating interlocking buckle, Figure 16. The buckle 16 is equipped with a pin which is not shown and which sits into and seals the opening 18 of the mentioned ring (Figure 3). We simultaneously insert both the loop 26 of the handhold 4 and the extendable elastic band 10 through the mentioned opening. By closing the opening and fitting/inserting the pin 16 into the opening of the ellipsoidal ring 12 the handhold 4 and the extendable elastic band 10 are connected firmly and safely. Identical procedure applies when attaching the second handhold 4 to the elastic band 10. The ellipsoidal ring 12 attachment is more flexible and safer in comparison to other state of the art attachments of handholds to extendable elastic bands, e.g. when sewn on latex or rubber.

[0013] The extendable elastic band 10 is in the form of loop whose ends are connected. It is made of rubber, latex or similar elastic material with an expansion coefficient in the range between $\alpha = 0.09 \text{ N/mm}$ and 0.35 N/mm . Elasticity of extendable elastic band is a mechanical property which means the ability of the material to return to its initial shape and size when forces are removed. The length of the extendable elastic band 10 between the two most distant points measured from the first to the second ellipsoidal ring 12 is approximately 310 mm, if considering a double band length. Preferably, the width of the extendable elastic band 10 is from 45 to 50 mm.

[0014] The stretching device 1 is generally assembled using two handholds 4 and extendable elastic band 10 so that the handholds are attached to the band 10 with two ellipsoidal rings 12 as described in Figure 1.

[0015] The stretching device 1 enables various stretching exercises in the aircraft cabin or anywhere where either the space for movement or the user's capabilities are restricted. Below are four exercises as an example of the use of the invented device.

Exercise 1

[0016] Use the stretching device 1 to stretch the triceps brachii and deltoid muscles at the back. Use one hand to fix one of the handholds and the other hand to stretch the invented device as shown in Drawing 4.

Exercise 2

[0017] Use the stretching device 1 to stretch the gluteus medius, gluteus minimus and vastus lateralis muscles. When sitting, wrap the device around your legs above the knees and hold the handholds firmly with your hands; stretch the elastic band with your legs to the width of the seat.

Exercise 3

[0018] Use the stretching device 1 to stretch the quadriceps, biceps femoris and gluteus maximus muscles. Hold firmly one of the handholds in the sitting position. Put your leg into the other one and stretch the band of the invented device.

Exercise 4

[0019] Use the stretching device 1 to stretch the triceps brachii muscles. When sitting, put your leg into one of the handholds, hold it firmly in this position and stretch the elastic band.

[0020] The invented stretching device overcomes various weaknesses of similar state of the art devices. It consists of two handholds which are loop-shaped on both ends to enable firm holding with hands and/or leg support which guarantees safe exercising. The stretching device is made of natural materials which cannot injure the skin of the person exercising. Preferably, it consists of extendable elastic band of prescribed expansion coefficient; both band ends are connected. The handholds are attached to the mentioned elastic band by two linking elements - the ellipsoidal rings in this invention. The advantage of this attachment is in extreme flexibility of the mentioned handholds. The invented stretching device enables numerous exercises in the sitting position and accelerates blood circulation of the least active groups of muscles during sitting.

[0021] The above description covers many specific features; however, they do not limit the possibilities of the invention but rather serve as an illustration of versions of the invented device. The scope of the invention is not defined by the described examples but by the patent claims which are added in continuation.

Claims

1. reads: A stretching device comprising two handholds, extendable elastic band, and linking elements

which enable simple attachment of handholds to an extendable elastic band so as to simultaneously insert one of both loop-shaped handholds and an extendable elastic band in a linking element and also simple replacement of handholds.

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2. reads: A stretching device as recited in Patent Claim 1, wherein a linking element is in the form of an ellipsoidal ring.

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3. reads: A stretching device as recited in Patent Claims 1 and 2, further comprising an ellipsoidal ring having at any position on the periphery a segment opening of any length, which is tightly closed by a rotating interlocking buckle.

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4. reads: A stretching device as recited in Patent Claims 1, 2, and 3, further comprising a handhold having a loop and a sling.

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5. reads: A stretching device as recited in Patent Claims 1, 2, 3, and 4, wherein a sling of a handhold is connected with a common joint, which firmly connects the upper and lower part of a loop.

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6. reads: A stretching device as recited in Patent Claims 1, 2, 3, 4, and 5, wherein the handholds of different lengths are varying from 180 to 250 mm.

7. reads: A stretching device as recited in Patent Claims 1, 2, 3, 4, 5, and 6, wherein a ring-shaped extendable elastic band is made of rubber or latex or similar elastic material with an expansion coefficient in the range between $\alpha = 0.09 \text{ N/mm}$ and 0.35 N/mm .

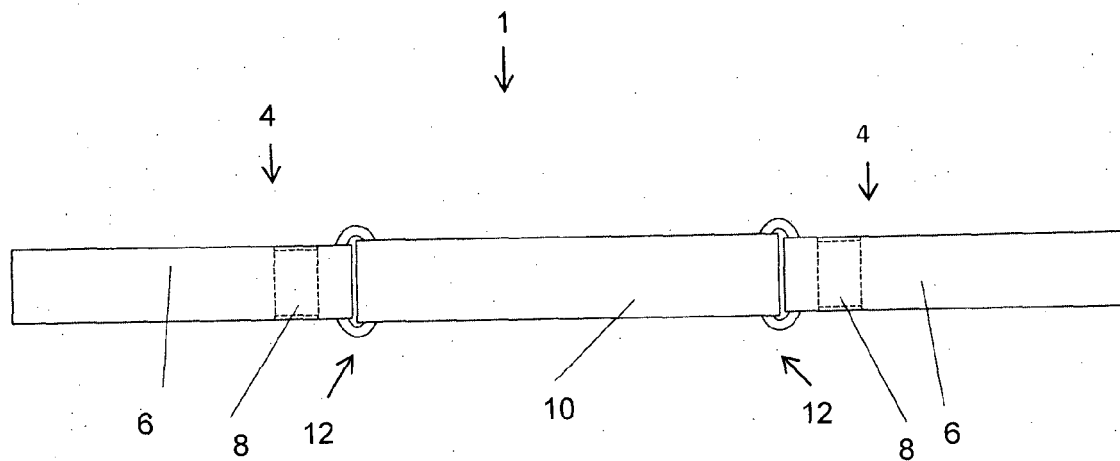
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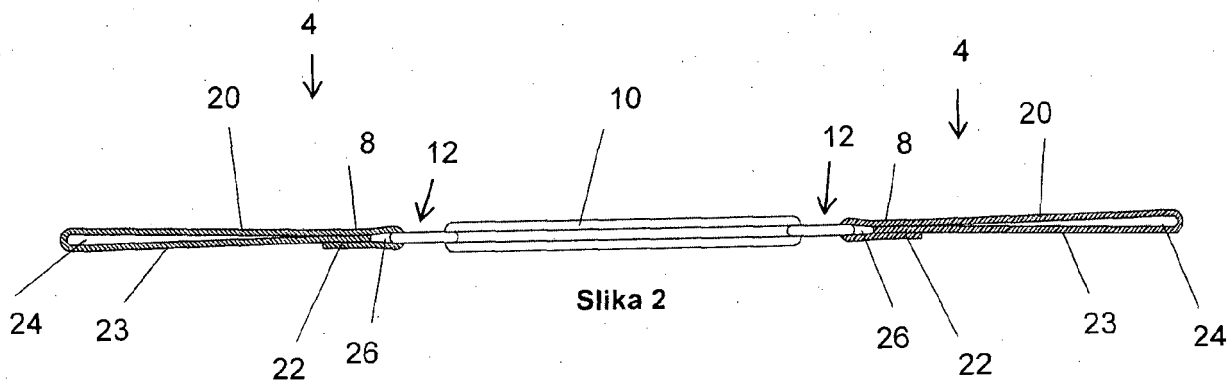
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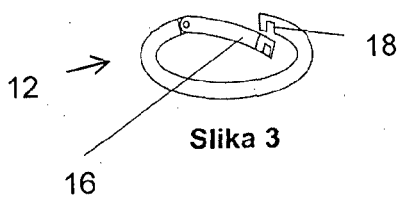
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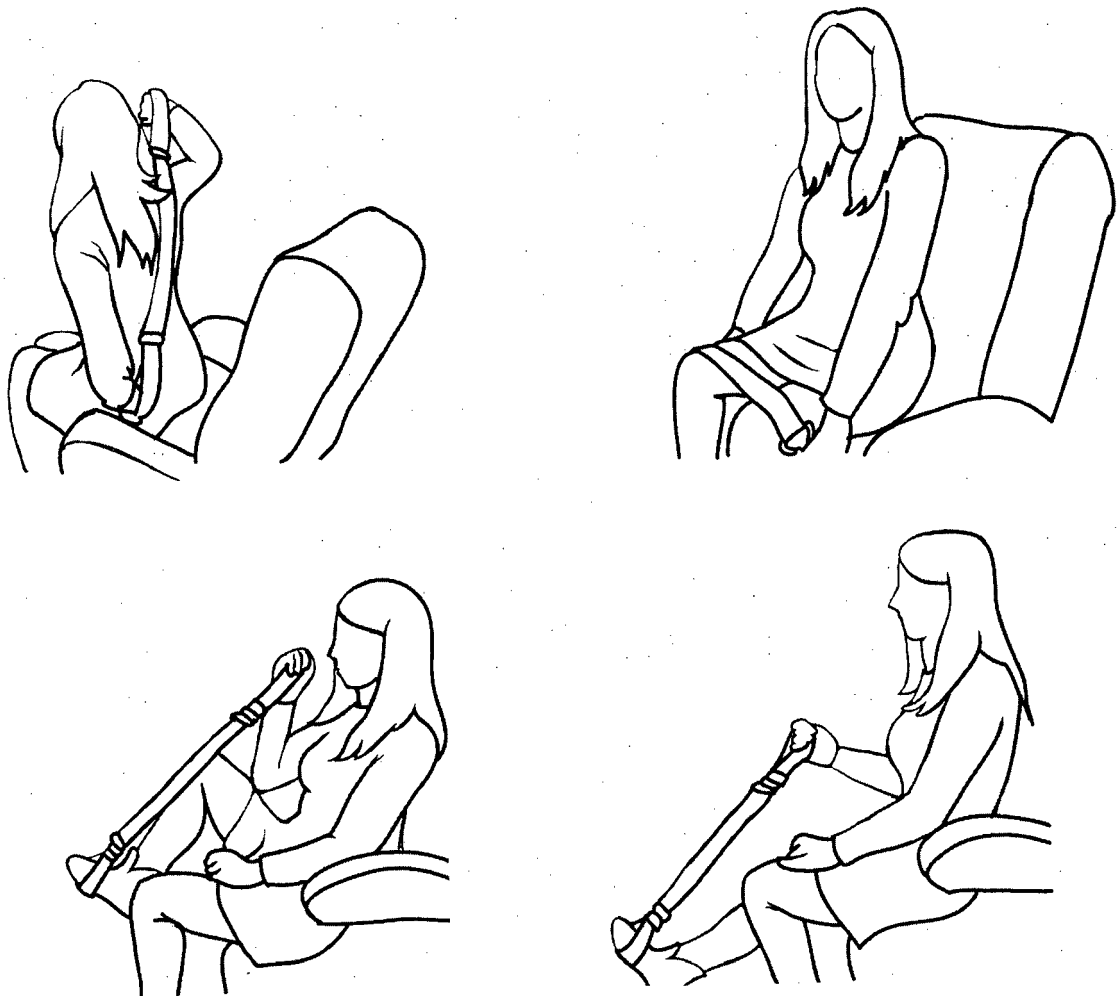
Slika 1



Slika 2



Slika 3



Slika 4



EUROPEAN SEARCH REPORT

 Application Number
EP 16 00 0354

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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	US 2003/045408 A1 (SELES MONICA [US]) 6 March 2003 (2003-03-06) * paragraphs [0009], [0023]; figures * -----	1-7	INV. A61H1/02 A63B21/055 A63B21/00
X	US 2006/084556 A1 (PAYNE MARK [US]) 20 April 2006 (2006-04-20) * paragraph [0019]; figures 1,2 * -----	1-7	
X	US 1 884 392 A (TREAT FRED C) 25 October 1932 (1932-10-25) * page 1, lines 41-77; figures 1,2 * -----	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			A61H A63B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 26 August 2016	Examiner Fischer, Elmar
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			

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

EP 16 00 0354

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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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26-08-2016

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003045408 A1	06-03-2003	NONE	
US 2006084556 A1	20-04-2006	NONE	
US 1884392 A	25-10-1932	NONE	

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82