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(54) **Therapeutic device for treatment of traveller's syndrom or deep vein thrombosis (DVT)**

(57) Device that enables the foot to turn at the ankle, in the vertical plane, up to 20° forwards and backwards, starting from the horizontal position when turning. It is characterized basically by an inferior end of cylindrical form, truncated by a support surface on the top forming a heel adapted to the foot's shape with and anti-slippery surface that contains protuberances distributed symmet-

rically in all its extension. The adjustment of the foot to the device is carried out by means of a subjection stripe at the instep area implemented with closing velcro, guaranteeing the complete fixation of the foot to the device. The use of the proposed device, before or after a plane trip, allows blood stream circulation, and prevents the lower-body inflammation known as Deep Vein Thrombosis (DVT).

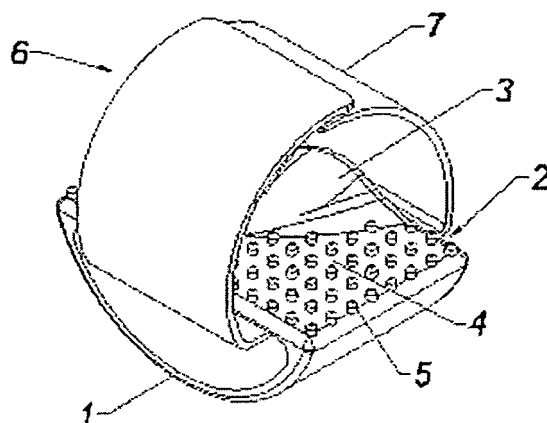


Fig. 1

Description

[0001] The present invention is related to the branch of mechanics, even when its main function is related to the medical field, because it is designed for legs' exercising, ankles, feet and toes during long journeys on seated position with the objective of reducing the risks of thrombosis.

BACKGROUND OF THE INVENTION

[0002] Deep Vein Thrombosis (DVT), affects veins of the lower body, mainly on the lower-legs and thighs, creating a blood cloth (thrombus) in the main veins of the legs. This thrombus can interfere circulation in the area and travels through the blood stream (embolism). The embolus created can find lodge in the brain, lungs, heart and other organs causing severe damages. This suffering fundamentally happens when remaining seated, been in bed or been immobilized for long periods of time, as it happens in long airplane or car trips.

[0003] Within the level of the techniques known, we can describe a set of analogous technical solutions that intends to solve the risks of thrombosis that we expose as follows:

[0004] The document from Great Britain: HK1044727 describes a device that is set in the floor on its straight-up configuration, the user sets the feet on the top board and swings the device in both directions. The use of this device is limited only to its straight-up position, which makes impossible its implementation on airplane trips because of the prohibition of remaining standing for long periods of time. Therefore, it does not guarantee an effective solution to prevent DVT because the angle of movement of the foot when using the device is very limited, not allowing the muscles and tendons to extend and contract properly.

[0005] The patent number GB 2374551, features a device that can be used on an airplane in order to prevent DVT. The device is made out of cardboard or plastic. It has an hexagonal shape and can contain a bottle or can of a non-carbonated beverage. The device it is rolled by the feet back and forth on the floor. The exterior surface of the device can feature semi-circular protuberances to reinforce the massage effect. This mean lacks of own operational usage, and it is limited to the existence of a bottle or cylindric container that fits on its interior. It also limits the feet's movement resulting on an insufficient therapy to prevent DVT.

[0006] Patent number EP 1304144 describes an exercising device to prevent DVT on passengers while seated. This invention presents a legs' support fixed to the passengers' seat and a feet support fixed to the lower end of the legs' support. A revolving spring is installed between the legs' support and the feet's support, in such way that the passenger can make pressure on the feet support with the objective of to flexing and extending the thighs muscles. This device lacks of technical conditions

because it can not be regulated to the physical characteristics of the passengers, resulting uncomfortable for those who does not require its usage. Since the mechanism it is fixed to the seat, its implementation is impossible on other areas rather than the passengers' seat.

[0007] The document containing patent GB 2370515, features an exercising device for airplane seats in order to prevent blood cloth and DVT. It has a tension member attached, directly or not, to the passenger's seat. This tension member is extended by the feet in repetitions when the passenger is seated. The device has the disadvantage that can be attached only to airplane seats whose design allows its fixation, because it requires that the back of the seat has to be tall enough to assemble it over the passengers' head. This device does not guarantee an effective treatment for preventing DVT because the feet's movement is very limited.

[0008] The technical solution described on GB 2374025, consists on a legs exercising device, that can be used on a seated position. This device stimulates blood circulation reducing the provability of DVT caused by inactivity. The device consists on, a resistance means and a shock absorber. It can include an indicator to count the number of repetitions of the exercise, an instrument of adaptation to accommodate to the different users' legs lengths and ranks of movement of the ankles. The device can be stored under an airplane seat or another vehicle. Being fixed to the seat, its use is conditioned to the travelling moment, not allowing an adequate treatment of DVT, since the effects of this suffering also can be declared several hours after travelling. In addition, its movement is not deep enough, it is to say the angle does not allow the muscles and tendons extend and contract as necessary to prevent DVT.

DESCRIPTION OF THE INVENTION

[0009] The objective of the present invention is to provide a device that allows a more efficient treatment of DVT; allowing its prevention and treatment in case of taking place, anywhere the user who undergoes this suffering.

[0010] The device proposed is made up of an inferior end of cylindrical form truncated by a surface of support in the top forming a heel adapted to the foot's shape with and anti-slippery surface that contains protuberances distributed symmetrically in all its extension. The adjustment of the foot to the device is carried out by means of a subjection stripe at the instep area implemented with closing velcro, guaranteeing the complete fixation of the foot to the device. The use of the proposed device, before or after a plane trip, allows blood stream circulation, and prevents the lower-body inflammation known as Deep Vein Thrombosis (DVT). This structural configuration allows the turn of the foot in the ankle in the vertical plane, up to twenty degrees in both senses from the horizontal position at any flat surface.

[0011] With the use of the proposed device it is not

only managed to prevent the occurrence of DVT, but also the happening of the same one, it also favours its treatment, since a series of oscillating movements from 20 to 60 repetitions, diminishes the inflammation caused by this suffering. Also, the protuberances located in the superior part of the anti-sliding surface activate neuralgic points of the foot heel, facilitating the blood circulation in the area. On the other hand, the proposed invention is characterized by being a simple and light device that admits its use in a small area and any position (seated or standing) that allows its support in a flat surface; what facilitates its use by people of different ages and sexes. In addition, it is of easy carry because of its small dimensions and weight, not limiting its single use to an airplane or other means of transport but also the treatment can be continued hours after a trip, in any place user will be.

Figure No. 1 Displays an isometric view of the proposed device.

Figure No. 2 Displays an isometric view of the subsection stripes.

Figure No. 3 Displays a front view of the proposed device.

Figure No. 4 Displays side view of the proposed device.

(2) it is conformed by a support heel (3) adapted to the foot insole and by an anti-sliding surface (4) that it has protuberances (5) symmetrically distributed in all its extension; a fixation mean (6) made up of a subsection stripe (7), with a closing velcro (8) located in its ends.

[0012] The proposed device is made up of an inferior end of cylindrical form (1), truncated by a top support surface (2), which is conformed by a support heel (3), adapted to the shape of the foot's heel with an anti-sliding surface (4), that it has protuberances (5), distributed symmetrically in all its extension. For the fixation of the foot to the device it is implemented a fixation mean (6), made up of a subsection stripe (7), located around the user's insole (not displayed) and the inner face of the surface of the top support (2), providing the foot's fixation to this surface by means of the union of the closing velcro (8), displayed at both ends of the subsection stripe (7).

[0013] The device is used as follows: the user places his/her foot on top of the support surface (2), placing the foot insole on the support heel (3). Next the foot is fixed to the device by the union of the free ends of the subsection stripe (7), through the closing velcro. Once the foot is properly fixed to the device it is begun to turn, in the ankle, up to 20 degrees in both senses (forwards and backwards) in the vertical plane around the line of support of the device. This movement be made as many times as considered, not affecting, physically, the person who uses it.

Claims

1. Therapeutic device for the treatment of the traveller syndrome that comprehends an inferior end of cylindrical shape and a top support surface. This inferior end of cylindrical shape (1) it is truncated by the surface of top support (2); such top support surface

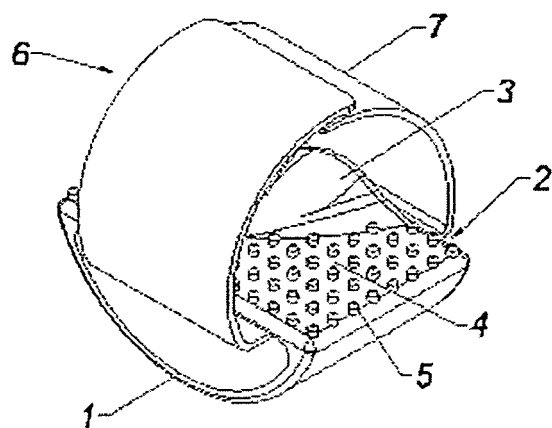


Fig. 1

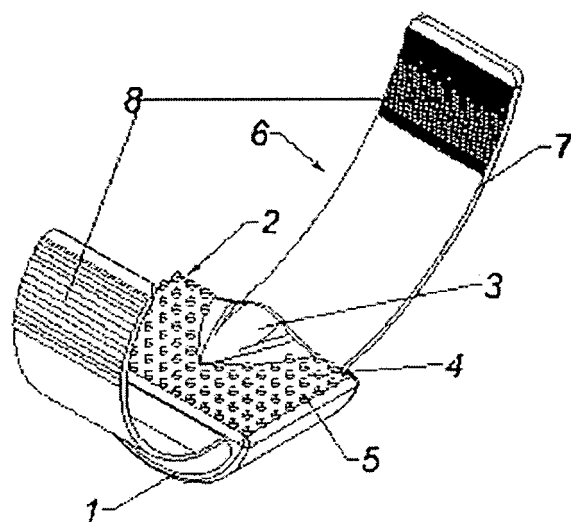


Fig. 2

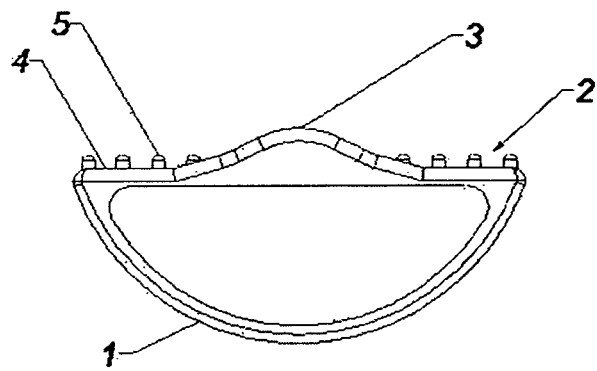


Fig. 3

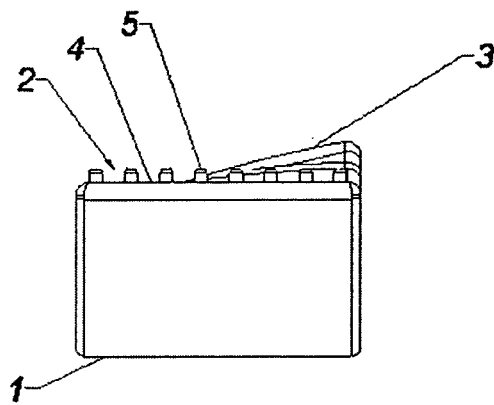


Fig. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 38 0133

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 5 413 543 A (DRAGO MARCELLO S [US]) 9 May 1995 (1995-05-09) * the whole document *	1	INV. A63B23/08
Y	US 2005/164845 A1 (DIGIOVANNI CRAIG S [US]) 28 July 2005 (2005-07-28) * paragraph [0015] - paragraph [0031]; figure 1 *	1	
A	US 6 421 935 B1 (BARTLETT MICHAEL D [US]) 23 July 2002 (2002-07-23) * the whole document *	1	
A	DE 202 11 576 U1 (SCHARLE BERTOLD [DE]) 23 January 2003 (2003-01-23) * abstract *	1	
A	DE 202 00 071 U1 (BEYER GERHARD [DE]) 25 April 2002 (2002-04-25) * abstract *	1	
A	US 4 206 558 A (BIVONA VINCENT J [US]) 10 June 1980 (1980-06-10) * the whole document *	1	TECHNICAL FIELDS SEARCHED (IPC)
			A63B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 February 2007	Examiner Jekabsons, Armands
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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EPO FORM 1503 03.82 (P04C01)

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

EP 06 38 0133

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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20-02-2007

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- HK 1044727 [0004]
- GB 2374551 A [0005]
- EP 1304144 A [0006]
- GB 2370515 A [0007]
- GB 2374025 A [0008]