United States Patent

Creamer

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[54] **NON-SLIP FOOT DEVICE**

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[52] **U.S. Cl.**.....**36/11.5,** 36/8.1
[51] **Int. Cl.**.....**A43b 3/12**
[58] **Field of Search**.....36/7.6, 2.5, 8.1, 9, 59, 11.5

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[57] **ABSTRACT**

A device for supporting the foot on a surface, such as a bed, wherein the device has a layer of frictionable material for underlying the foot to cause a frictional force to be developed between the layer and the surface to inhibit movement of the foot in one direction as the leg is in a relazed, flexed condition. A number of embodiments of the device are disclosed.

7 Claims, 7 Drawing Figures

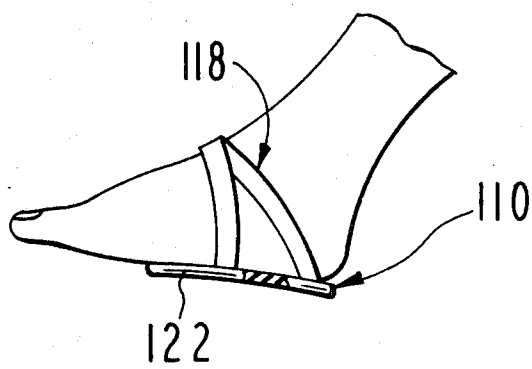
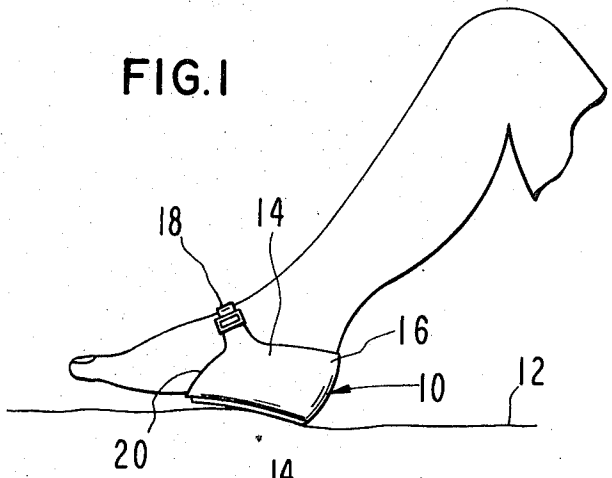


FIG.1



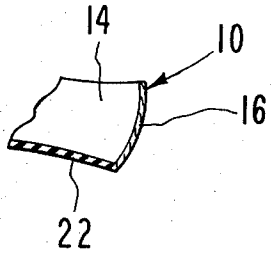


FIG.1A

FIG.2

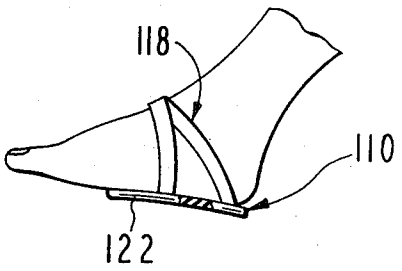


FIG.3

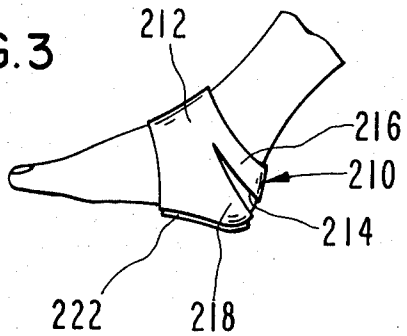


FIG.6

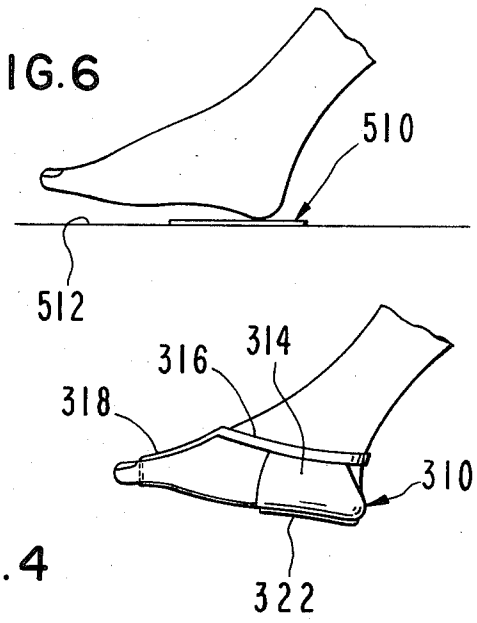


FIG.4

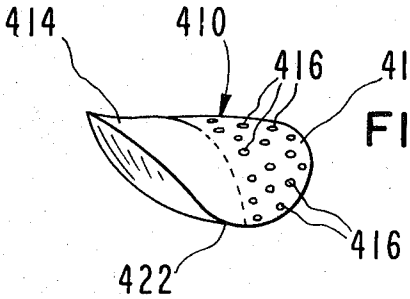


FIG.5

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NON-SLIP FOOT DEVICE

This invention relates to improvements in footwear for use in lounging and, more particularly, to a device which holds the foot on the surface of a bed when the leg is bent and held in a relaxed state.

The present invention is adapted for use by people sitting or reclining in bed and who desire to hold their legs in bent or flexed positions to avoid the discomfort which generally arises due to having the legs stretched out full length along the bed surface. Many persons who are bed-ridden or must remain in bed for extended periods of time often experience discomfort because they are unable to hold their legs for certain periods of time in bent positions while the rest of the body is in a sitting or reclining position. The reason for this is that the legs, when flexed, cannot generally remain so without the feet sliding forwardly over the surface of the bed unless strain is placed on the legs to prevent such forward movement. This strain prevents relaxing of the legs and eventually causes muscle irritation; hence, the legs cannot generally be relaxed at any time and as a result, the person experiences discomfort and cannot find a comfortable position while sitting or reclining.

The present invention provides a device which is adapted to support the foot to substantially inhibit forward movement of the foot over the surface of the bed when the leg is bent or flexed and in a relaxed state. Thus, the weight of the leg will tend to cause forward movement of the foot but the device will develop a frictional force tending to prevent any such forward movement. As a result, the person can be in a setting or reclining position with the legs bent and relaxed while being assured that the feet will not slide forwardly and into a position which will cause discomfort.

The device of the present invention has a layer of frictionable material which is adapted to underlie the foot and to prevent its movement in a forward direction with respect to the surface of the bed. The material can be of rubber, neopreme or the like, which, when placed in engagement with a fabric, such as a bed sheet or the like, causes a frictional force to be developed when there is a tendency to cause the layer to move over the fabric surface.

The device of the present invention is simple in construction and can take the form of any one of a number of different embodiments. The device can be formed with means for quickly and easily attaching the same to the foot so that the layer of frictionable material thereon underlies the foot. The device can be made so that it can be folded into a compact form for storage and can be worn without causing any discomfort to the foot.

The primary object of this invention is to provide a device having a layer of frictionable material adapted to support the foot on a surface to cause a frictional force to be developed between the surface and the foot to inhibit movement of the foot in one direction over the surface when the leg is flexed and in a substantially relaxed condition.

Another object of this invention is to provide a device of the type described which can be formed from any one of a number of different embodiments including an embodiment wherein the layer is secured to the underside of the foot in a manner to avoid causing discomfort to the wearer yet allowing the foot to be moved about while the layer remains securely disposed on the bottom of the heel.

Other objects of this invention will become apparent as the following specification progresses, reference being had to the accompanying drawing for illustrations of a number of embodiments of the invention.

In the drawing:

FIG. 1 is a side elevational view of a first embodiment of the device of this invention with the device being shown on the foot and in an operative position for holding the leg against movement over a generally flat surface;

FIG. 1*a* is an enlarged, fragmentary, cross-sectional view of the device of FIG. 1, showing the layer of frictional material on the bottom thereof;

FIGS. 2–4 are views similar to FIG. 1 and illustrating other embodiments of the device;

FIG. 5 is a perspective view of still another device forming an embodiment of the invention; and

FIG. 6 is another device of the invention for positioning between the foot and a surface for supporting the foot.

The first embodiment of the device of this invention is illustrated in FIG. 1 and includes a device **10** which is adapted to be coupled to the foot so as to be worn thereon generally in the vicinity of the heel and to engage a surface **12** much in the manner of a slipper or shoe. In fact, device **10** has the same form as the rear portion of a conventional shoe in that it has a pair of spaced sides **14**, only one of which is shown in FIG. **1**, and a back **16** interconnecting sides **14**. A strap and buckle unit **18** is used to releasably interconnect sides **14** so that device **10** can be readily placed on and taken off the foot. The forwardmost edge **20** of each side **14** is located adjacent to the mid part of the foot.

The bottom of device **10** is provided with a layer **22** of frictionable material, such as rubber, neopreme or the like. Layer **22** can be secured in any suitable manner to a sole provided for device **10**. However, layer **22** can itself define the sole as shown in FIG. 1*a*. The layer extends substantially to the front edge **20** of each side **14** and is adapted to engage surface **12** so as to provide sufficient frictional force to counter any tendency for the foot to slide forwardly when the leg is flexed or bent in the manner shown in FIG. **1**. Layer **22** could also be sufficiently long so as to substantially underlie the entire foot, in which case, sides **14** would extend forwardly from the locations shown in FIG. **1**.

In use, device **10** is placed on the foot by use of the strap and buckle unit **18** and the user can then flex the leg in the manner shown in FIG. **1** until layer **22** engages surface **12**. Thus, the leg can be relaxed and the weight of the leg will tend to cause the foot to move forwardly over surface **12**. However, because layer **22** engages this surface, the frictional force developed between the layer and surface **12** will be sufficient to counter this tendency for the foot to move forwardly. As a result, the leg will remain in the flexed or bent condition even though the leg is relaxed, thus allowing the user of the device to remain in a comfortable position, such as in a sitting or partially reclining position. Surface **12** will generally be a cloth or fabric surface, such as a bed sheet or the like, so that device **10** is especially adapted for use in bed.

Device **10** can be made in any one of a number of different sizes and can be formed from any suitable material, such as a fabric or the like, with layer **22** affixed to the fabric. Also, one particular size of device **10** can fit feet of different sizes if the fabric defining sides **14** of device **10** is sufficiently flexible to permit some expansion due to, for instance, the width of the foot of the user. The device does not cause discomfort to the foot when worn so that if the user falls asleep with the device on the foot, there will be no ill effects due to prolonged wearing of the device.

Another embodiment of the invention is shown in FIG. **2** and includes a device **110** having a layer **122** of frictionable material, such as rubber, neopreme or the like, forming the bottom of the device. Strap means **118** is coupled to layer **122** and is adapted to extend over the upper part of the foot to hold layer **122** on the bottom of the foot adjacent to the heel. In this embodiment, the foot is extended through the strap means, the latter forming a loop for receiving the foot. Device **110** is used in substantially the same manner as device **10** wherein layer **122** engages a surface, such as surface **112**, which will be of fabric material or the like so that a frictional force is developed between the surface and layer **122** to inhibit forward movement of the foot when the leg is flexed in the manner shown in FIG. **1**.

The bottom of device **110** can be formed in any suitable manner. For instance, layer **122** can comprise the entire bottom of device **110** as shown in FIG. **2**. In the alternative, device **110** can be provided with a sole to which layer **122** is bonded or otherwise affixed. Also, strap means **118** can be formed from any suitable material, such as an elastic band or the like, so as to hold layer **122** against the bottom of the foot.

Another embodiment of the device is shown in FIG. **3** and is denoted by the numeral **210**. This device has a sock-like construction when the main body **212** of the device is formed of a fabric material which is put on the foot in much the same manner as is a sock. Body **212** is provided with a slit **214** therein to define an upper, rear strap **216** for engaging the back of the foot to hold body **212** on the foot. The slit also defines a lower portion **218** provided with a layer **222** of frictionable material, such as rubber, neopreme or the like. Layer **222** is affixed to portion **218** in any suitable manner, the layer serving the same purpose as layers **22** and **122** of devices **10** and **110**. Device **210** is used in the same manner as devices **10** and **110** wherein layer **222**, when engaging a surface of fabric material or the like, causes a frictional force to be developed between layer **222** and the adjacent surface to inhibit forward movement of the foot when the leg is placed in the manner shown in FIG. **1**.

A further embodiment of the invention is shown in FIG. **4** and includes a device **310** having a pair of sides **314**, only one of which is shown, and strap means including a first strap **316** for encircling the upper part of the foot and a second strap **318** for extending forwardly from strap **316** for passage between a pair of toes and then rearwardly to a layer **322** of frictionable material, such as rubber, neopreme or the like, which is on the bottom of device **310** in spanning relationship to sides **314**. Layer **322** is provided for the same purpose as the layers of the other devices. Thus, device **310** is used for the same purpose as devices **10**, **110** and **210**.

Sides **314** and straps **316** and **318** of device **310** can be made from any suitable material, such as a fabric or the like. In the alternative, straps **316** and **318** can be formed from an elastic band for holding layer **322** on the bottom of the foot without causing discomfort to the foot.

FIG. **5** illustrates a further embodiment of the invention and includes a device **410** having the heel portion **412** and an arch portion **414** for underlying the arch of the foot when the device is worn. Heel portion **412** is provided with an irregular surface having openings or depressions **416** which define a gripping means for gripping the foot in the vicinity of the heel to keep the device secured to the foot when portion **414** underlies the arch of the foot.

A layer **422** of frictionable material, such as rubber, neopreme or the like, is secured to the bottom of heel portion **412** and is provided for the same purpose as the layers of the other devices mentioned above. Layer **422** can define the entire heel portion **412** and thereby be provided with openings or depressions **416** on its upper surface. In the alternative, heel portion **412** can be formed of a material different from layer **422** with the layer being bonded or otherwise secured to the other material.

In use, heel portion **412** is pressed against the heel of the foot so that the irregular surface adheres to the bottom of the foot by a gripping action. When this occurs, portion **414** will underlie the arch of the foot and layer **422** will be in a position to engage a fabric surface therebelow. Thus, the device can then be used to cause a frictional force to be developed between layer **422** and the surface therebelow to prevent forward movement of the foot when the leg is bent in the manner shown in FIG. **1**.

FIG. **6** illustrates a further embodiment of the invention wherein a device **510** in the form of a sheet of frictionable material, such as rubber, neopreme or the like, is provided to support the heel of the foot on a surface **512**, such as fabric or the like. The device defines a layer of frictionable material which engages surface **512** to cause a frictional force to be developed between the layer and the surface to prevent forward movement of the foot when the leg is flexed in the manner shown in FIG. **1**. Sufficient frictional force will be developed also between the foot and the upper surface of device **510** so that the foot is substantially prevented from moving forwardly even though the leg is relaxed and in the flexed condition of FIG. **1**.

The present invention provides a simple means of holding the foot against forward movement over a fabric surface so that the device can be used in a number of different applications. The device is especially suitable for bed-ridden patients who oftentimes must recline or lie in bed with the legs flexed in order to enhance blood circulation through the legs. The device of the invention allows flexing of the legs while permitting the legs to remain relaxed so that undue strain on the legs is avoided to thereby eliminate the problems of stiffness in the legs due to the development of strain therein.

I claim:

1. A device for holding the foot against movement over a surface, said device comprising an open backed body including a layer of frictionable material adapted

to be disposed between the foot and a surface and to cause a frictional force to be developed between the layer and the surface sufficient to hold the layer and thereby the foot against any substantial movement relative to the surface when the leg is in a substantially relaxed, flexed condition and when at least a portion of the foot is supported by the layer on the surface, said layer having a front margin and a rear margin, the distance between the front and rear margins being substantially less than the length of the foot.

2. A device as set forth in claim 1, wherein is provided a pair of straps secured to and extending upwardly from each side of the layer, said straps being convergent as the upper extremities thereof are approached.

3. A device as set forth in claim 1, wherein is included a pair of spaced sides secured to and extending upwardly from said layer, each side having a free rear margin, a first strap means for encircling the upper part of the foot when the heel is between the sides and second strap means coupled to said layer and said first strap means for insertion between a pair of toes when the first strap means encircles said upper part of the foot.

4. A device as set forth in claim 1, wherein said body includes a sock-like member secured to the layer and extending upwardly therefrom, said member being tubular to receive and encircle the portion of the foot only in front of the ankle and beneath the heel to permit the layer to be carried thereon beneath the heel and a strap on the member for holding the member on the foot.

5. A device as set forth in claim 1, wherein is provided an irregular, foot-engaging surface on the upper part of the layer, said surface defining a means for gripping the bottom of the foot.

6. A device as set forth in claim 1, wherein said layer comprises a sheet of said material, said sheet having an upper, foot-engaging surface.

7. A device for holding the foot against movement over a surface comprising: a layer of frictionable material; means having an open back and coupled with said layer for releasably holding the latter on the foot to thereby permit the layer to support the foot on the surface and to cause a frictional force to be developed between the layer and the surface sufficient to hold the foot against any substantial movement relative to the surface when the leg is in a substantially relaxed, flexed condition, said layer having a front margin and a rear margin, the distance between the front and rear margins being substantially less than the length of the foot.

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