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3,345,656

FOOT PROTECTIVE DEVICE

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FIG. 1.

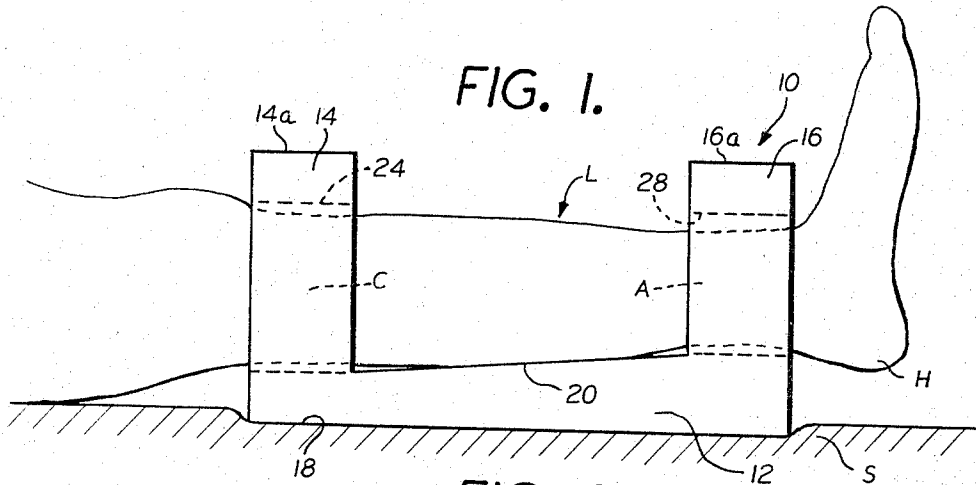


FIG. 2.

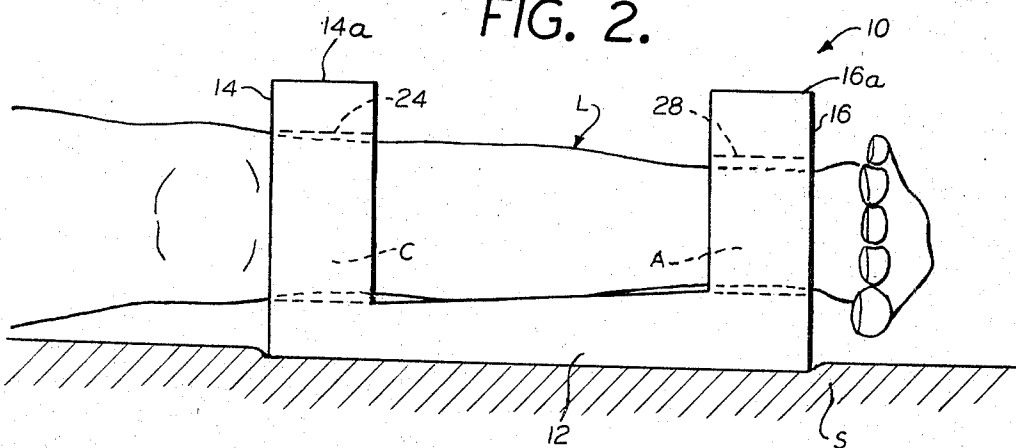
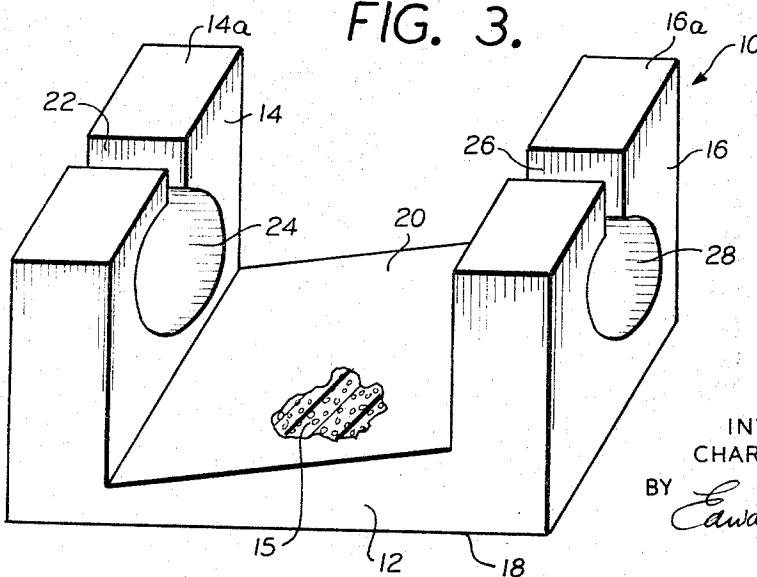


FIG. 3.



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1

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FOOT PROTECTIVE DEVICE

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The present invention relates to improvements in prophylactic devices, and in particular to a novel and improved leg-supporting device for maintaining the feet of a bed-ridden patient above the surface of the bed.

It is well known that when a hospital patient or other bedridden person lies immobilized for extended periods of time, the weight of the legs and overlying blankets is concentrated on the feet, causing foot sores to develop. Most commonly, the patient is lying upon his back, resulting in the formation of decubitus ulcers on the heel. Even where the patient is lying on his side, his leg weight is concentrated on the bony prominences of his ankle, resulting in similar ulcers or pressure necrosis which forms dead tissues.

There have been attempts to remedy this problem by the provision of foot-supporting structures placed on the bed and having an elevated surface positioned to support the calf of the leg or ankle in such a manner that the heel is freely suspended above the bed sheets. Since these structures are stationary upon the bed, they are effective for their purpose only when the patient is completely immobilized and remains on his back in an invariable, stationary position. This is seldom the situation, however, and when the patient bends his knees or otherwise shifts position, the feet slide off the stationary structure and rest upon the bed sheets. Further, the aforementioned devices are ineffective to support the feet properly when the patient is lying on his side, and under such circumstances his legs are still supported on the bony ankle prominences with the latter subject to ulcer formation.

It is the object of the present invention to provide a foot protective device for preventing the formation of decubitus ulcers which is effective in supporting the vulnerable portions of the leg above the bed surface regardless of the position in which the user is reclining.

Another object of the invention is the provision of a foot protective device of the character described which is mounted upon the foot itself so as to be constantly in position for supporting the foot with the heel or ankle raised above and out of contact with the bed surface, regardless of the user's position and regardless of movement of the feet.

Another object of the invention is the provision of a foot protective device of the type described which is formed entirely of a soft, flexible material and so constructed as to provide maximum comfort for the user. The material used is also light, porous and air-permeable so that the device can be used by a patient for long periods of time without irritating the skin or otherwise causing discomfort.

A further object of the invention is to provide a foot protective device of the type described which is of simple construction and economical in manufacture, and which may be quickly and easily applied for use.

In accordance with the present invention, there is provided a foot protective device formed of a soft, flexible, light weight material with an elongated base and a pair of

2

spaced upstanding end walls. Each of the end walls has a relative narrow slot extending downwardly from the center of its upper surface and terminating in an enlarged circular bore centrally located in the wall. The bores of the end walls are sized to receive and retain the calf portion and ankle portion of a human leg and the communicating slots are capable of being expanded to permit the passage of these leg portions therethrough. The upper surface of the base is upwardly inclined from one end wall to the other to conform to the curvature of the calf of the leg contained in the device and to provide a soft support surface by means of which the weight of the leg is distributed along the entire calf area between the two end walls.

Additional objects and advantages of the invention will become apparent in the course of the following specification when taken in connection with the accompanying drawings, in which:

FIG. 1 is a side elevational view of a foot protective device made in accordance with the present invention, showing the device in upright position and supporting a leg above the surface of a bed;

FIG. 2 is an elevational view similar to FIG. 1, showing the foot protective device in upright position on the bed surface, but with the leg and foot turned 90° therein, and

FIG. 3 is an isometric view of the foot protective device.

Referring in detail to the drawings, there is shown in FIG. 3 a foot protective device 10 made in accordance with the present invention. The device 10 is preferably formed in one piece of a soft and flexible light weight material such as foam rubber, urethane foam or the like, as indicated at 15 in FIG. 3, which material is also preferably porous and airpermeable to enable it to remain in contact with the skin of the patient for long periods of time without causing irritation or discomfort. For the same purpose, the material may also be absorbent. The device 10 generally comprises a base 12 terminating at each end in upstanding end walls 14 and 16.

The base 10 is a rectangular in plan view, as shown in FIG. 2, and has a flat bottom surface 18 adapted to rest upon the surface of the bed. The base 10 also has an inclined top surface 20 extending from the end wall 14 upwardly to the end wall 16.

The end walls 14 and 16 are of substantial thickness and each is preferably of the rectangular shape shown. While the end wall 16 is of lesser length than the end wall 14 owing to the inclined base surface, both end walls extend upwardly to the same height above the base flat bottom surface 18, and their respective top surfaces 14a and 16a are aligned and coplanar, as shown in FIG. 1. The walls 14 and 16 have flat side surfaces which are coplanar with each other and with the flat side surfaces of base 12, so that the entire device 10 has opposed flat side surfaces.

The end wall 14 is formed with a through slot 22 which extends through the center of the top surface 14a thereof to an intermediate point on said end wall 14. The slot 22 terminates in and communicates with a relatively large circular bore 24 which extends through the center of end wall 14. The end wall 16 is similarly formed with a slot 26 terminating in a circular bore 28 centrally located in end wall 16. The bore 24 is of larger diameter than the bore 28 in order to receive a larger portion of the leg, as will be presently described.

Because of the flexible nature of the constituent material forming end wall 14, the side portions of said wall adjacent the slot 22 may be spread apart to provide an enlarged top access opening for the bore 24, through which a leg may be inserted. In the same manner, the end wall 16 may be spread apart in the area of slot 26.

In use, the foot protective device 10 is initially employed while the patient is lying on his back. The patient's leg L is lifted and the device 10 is placed beneath the leg with the flat bottom surface 18 of base 12 resting upon the under sheet or mattress covering constituting the bed surface S. The leg L is then slowly lowered until it rests upon the top surfaces 14a and 16a of the respective end walls 14 and 16, and the weight of the leg forces apart the wall sections surrounding the slots 22 and 26, forming enlarged openings to the bores 24 and 28, as previously described. These enlarged openings are sufficiently wide to permit the registering areas of the leg to pass therebetween, so that the leg moves downwardly until it is received in bores 24 and 28. The upper wall portions thereupon reclose over the leg and resume their unextended shape.

FIG. 1 shows the leg L supported within the device 10 in the position it assumes when the patient is lying on his back. In this position the ankle area A of the leg is located within the bore 28 and the calf portion C immediately below the knee is located within the bore 24. The bores 24 and 26 are of sufficient diameter to receive the aforesaid leg portions of average size with a slight clearance. The inclined upper surface 20 of the base is formed at an angle corresponding to the natural curvature of the calf, so that the entire calf portion of the leg between the walls 14 and 16 rests flush thereupon. Thus the weight of the leg and its overlying blankets is distributed evenly over a large area instead of being concentrated at the heel in the normal manner. The leg L is therefore comfortably supported on the soft and flexible material constituting base 12, which yields to further conform to the shape of the calf, with the heel H raised above the bed sheets and freely suspended.

With the leg L inserted into the device 10, as shown in FIG. 1, the soft and yieldable end walls 14 and 16 flex slightly, permitting the bores 24 and 28 to assume the proper shape to closely encircle the contained areas of the leg, although the leg is contained loosely enough to permit rotation thereof within said bores, as will be presently described. While the slots 22 and 26 had spread apart under the weight of the leg to permit downward passage of the latter therethrough, as previously described, the slots 22 and 26 had reclosed over the leg. Since the normal width of the slots is substantially smaller than the width of the leg, the wall portions bordering the slots 22 and 26 overlie the leg portions contained in bores 24 and 28 and serve to maintain the device 10 mounted on the leg. Thus, if the leg L is lifted from the position shown in FIG. 1, the device itself is not sufficient to cause the slots 22 and 26 to expand. The bores 24 and 26 are small enough to prevent the device from becoming detached or loosened by motion of the leg or body in any direction.

It will be appreciated that a pair of identical devices 10 are employed for each patient, a device being mounted upon each leg. As the patient moves in the bed, the devices 10 move with the legs and remain mounted thereon in the proper supporting position. Even if the patient turns to lie on his side, the devices are still effective to support the leg comfortably with the ankle and foot raised above the surface of the bedding. FIG. 2 shows the position of the leg L with the patient lying on his side. In this position, the device 10 has remained in upright position on the bed surfaces, but the leg has turned 90° within the bores 24 and 26. The leg L is thus still supported within the bores 24 and 28, with the side of the calf resting upon the inclined base surface 20 and the foot and ankle

of the leg suspended above the bed surface S and out of contact therewith.

It will be appreciated that the device 10 is effective in protecting the heel, and ankle and foot portions of the leg from the formation of decubitus ulcers and the like, at all times and regardless of the position of the patient.

In a preferred embodiment, by way of example, the device 10 was made with an over-all length of sixteen inches, width of ten inches, and height of eight inches. The bore 24 was six inches in diameter, and the bore 28 four inches in diameter.

While a preferred embodiment of the invention has been shown and described herein, it is obvious that numerous additions, changes and omissions may be made in such embodiment without departing from the spirit and scope of the invention.

What I claim is:

1. A leg-supporting device for maintaining the foot of a bedridden person above the level of a bed surface, said device comprising a unitary body structure made of a soft, flexible material and including a base having a flat bottom surface, a pair of spaced, aligned end walls upstanding from said base, each of said end walls having a through bore centrally located therein, and a slot extending from an edge of each of said end walls to said bore and communicating therewith, said bores being of varying diameter and being respectively sized to receive and retain the upper calf portion and the ankle portion of a human leg, said base having an inclined top surface extending from one end wall to the other end wall, said inclined surface being disposed to receive the calf portion of the leg resting flush thereupon between said two end walls, with the foot projecting beyond one of the end walls and suspended above the level of the base bottom surface.

2. A leg-supporting device for maintaining the foot of a bedridden person above the level of a bed surface, said device comprising a unitary body structure made of a soft, flexible, light weight material and including an elongated base having a flat bottom surface adapted to rest flush upon said bed surface, first and second spaced, aligned and parallel end walls upstanding from opposite ends of said base, each of said end walls having a through bore centrally located therein and a relatively narrow slot extending from the top surface of each of said end wall to said bore and communicating therewith, the bore of said first end wall being of greater diameter than the bore of said second end wall and being sized to receive and retain the upper calf portion of a human leg, the bore of said second end wall being sized to receive and retain the ankle portion of said leg, with the foot projecting beyond said second end wall, said base having an inclined top surface extending upwardly from said first end wall to said second end wall, said inclined surface being disposed to receive the calf portion of the leg between said two end walls resting flush thereupon, with the foot freely suspended beyond said second end wall above the level of the base bottom surface.

3. A leg-supporting device according to claim 2 in which said bores are made sufficiently larger than the portions of the leg to be contained therein to permit the leg to be rotated within said bores while the device remains in upright position with the base bottom surface resting upon said bed surface.

4. A leg-supporting device for maintaining the foot of a bedridden patient above the level of a bed surface, said device comprising a unitary body structure made of a soft, flexible, light-weight, porous material and including an elongated base having a flat bottom surface adapted to rest flush upon a bed surface, first and second spaced, aligned end walls integral with and upstanding from opposite ends of said base, said end walls having opposed flat side surfaces continuous and co-planar with the respective side surfaces of said base, each of said end walls having a through bore centrally located therein and spaced

5

from the side surfaces thereof and from the bottom surface of said base, and a slot extending from the top surface of the respective end wall to said bore and communicating therewith, the bore of said first end wall being of a diameter to receive and retain the upper calf portion of a human leg, and the bore of said second end wall being of a lesser diameter and sized to receive and retain the ankle portion of a human leg, said base having an inclined top surface extending from one end wall to the other end wall, said inclined surface being disposed to receive the calf portion of the leg in a substantially level condition, resting flush thereupon between said two end walls, with the foot projecting beyond said second end wall and suspended above the level of the bed surface regardless of the angular disposition of said leg relative to said device.

5. A leg-supporting device according to claim 4, in which the slot of each end wall is of substantially lesser

6

width than the diameter of the communicating bore, said slot being adapted to be spread apart to permit the entrance of the corresponding leg portion into said bore, the sides of said slot normally overlying the leg portion contained within said bore to maintain said leg portion in said bore.

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