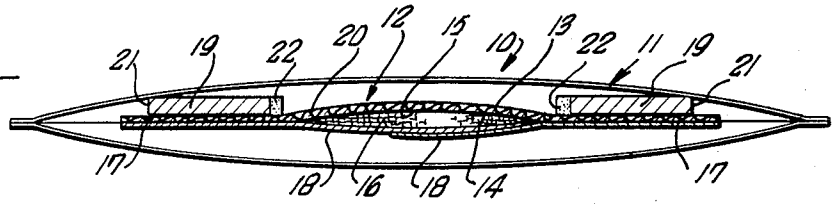
June 18, 1968 B. L. STEEL 3,388,702

DRESSING FOR A CORN AND THE LIKE

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FIG. 1



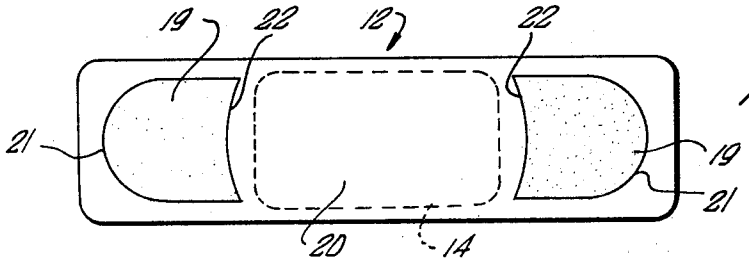
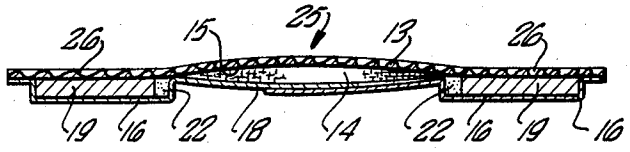


FIG. 2

FIG. 3



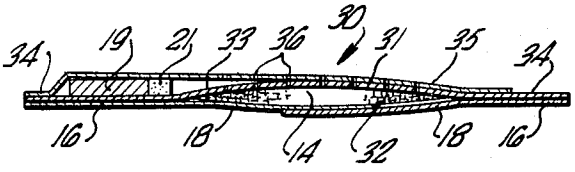
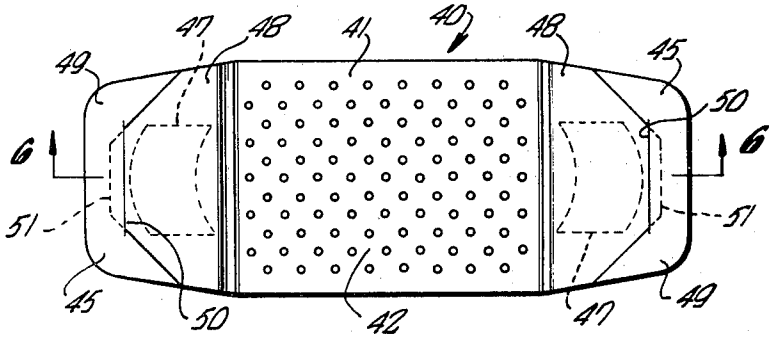


FIG. 4

FIG. 5



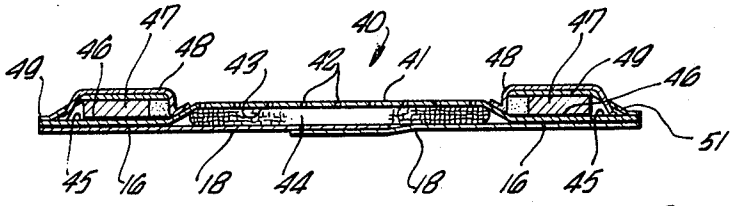


FIG. 6

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FIG. 7.

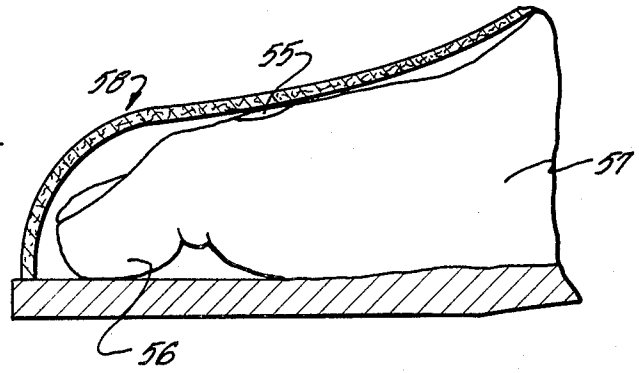


FIG. 10.

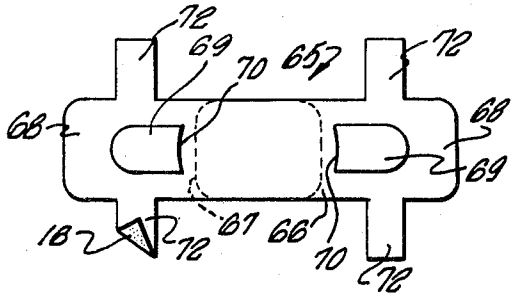


FIG. 8.

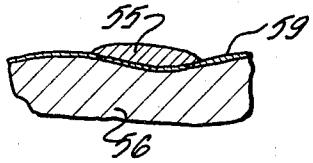


FIG. 9.

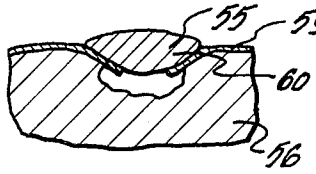


FIG. 11.

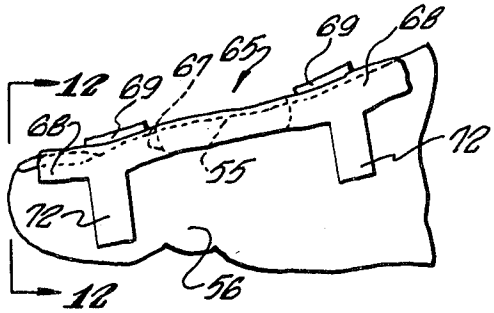
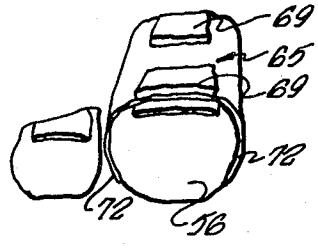


FIG. 12.



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3,388,702

DRESSING FOR A CORN AND THE LIKE

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Filed Feb. 21, 1966, Ser. No. 528,873
15 Claims. (Cl. 128—153)

This invention relates to a sterile dressing and protective appliance for use in treating corns, bunions and the like.

A principal causative factor in the occurrence of corns on feet is undue pressure applied to a small area of a foot, usually to a toe, by the shoes a person wears. It has long been believed that a corn will disappear naturally if the pressure is relieved. Accordingly, corn plasters now in use and commercially available consist essentially of a flexible base, usually made of cloth or synthetic film, having a shape corresponding to the general shape of a corn to which the plaster is to be applied, but somewhat larger in size than the corn. One side of the base is coated with a pressure-sensitive adhesive around a central area intended to be placed over the corn. Usually a backing strip is releasably adhered to the adhesive to prevent the accumulation of foreign matter on the adhesive prior to use of the plaster. The plaster also consists of a ring of felt or the like secured to the other side of the base peripherally of the central area of the base. When the plaster is applied over a corn, the annular felt pad lies peripherally of the corn and prevents a shoe or the like from bearing directly upon the corn. The plasters are not sold in sterile packages since sterility of the plasters is not necessary to the protection of the plaster from pressure by a shoe or the like. As a result, the plasters now available commercially, because of the many hands through which they pass, are far from sterile. In many cases of corn treatment, the unsterile nature of the presently available plasters is not harmful.

Very often corns produce openings in the skin below the corn. Also, openings caused by abrasion or a puncture can be produced below a corn by the individual during self-treatment of the corn. If such openings do not become infected before treatment by corn plaster is commenced, the opening is very likely to become infected because of the use of an unsterile plaster on the corn. If the opening is already infected, the use of an unsterile plaster on the corn will do the infection no good and may aggravate the infection.

The unsterility of presently available corn plasters is a very real problem when it is realized that such plasters are quite widely marketed in myriad retail outlets. These plasters are marketed in such a manner as to suggest to a large segment of the purchasing public that the treatment of a corn is a simple matter and that prefessional care is not required. Where a person suffers from a simple corn which has not produced a break in the skin, the use of these plasters may do some good, and it usually does no serious harm even if the corn does not disappear. In the case where the corn is advanced and has produced an opening in the skin, which opening may or may not be infected, the suggestion that an unsterile plaster may be used to advantage without consultation with a person having medical training can cause serious harm.

This invention provides an improved corn plaster and the like. A principal feature of the plaster is that it is sterile and is contained in a sealed package until ready for use so that its sterility is maintained. Also, in the preferred form, the plaster is arranged to correct partial contraction of toe tendons, a condition which usually precedes and indirectly causes the occurrence of corns.

Generally speaking, this invention provides a sterile dressing for a corn and the like. The dressing includes a flexible base having an obverse side and a reverse side.

A sterile pad, sized to cover a corn or the like of selected size, is secured to the base substantially centrally of the base. A protective pad, fabricated of a deformable material having limited compressibility, is secured to the base adjacent the sterile pad for protecting a corn and the like overlaid by the sterile pad in use of the dressing from pressure by a shoe or the like. A layer of pressure-sensitive adhesive is disposed over the obverse side of the base at least adjacent the sterile pad. Protective sheet means are releasably adhered to the adhesive over the extent of the adhesive. The above-described structure is housed in a sealed package in a condition of sterility until use of the dressing.

The above-mentioned and other features of the present invention are more fully set forth in the following detailed description of the invention presented with reference to the accompanying drawings, wherein:

FIG. 1 is an enlarged cross-sectional elevation view of a dressing assembly according to this invention;

FIG. 2 is a top plan view of the dressing shown in FIG. 1 removed from its sealed package;

FIG. 3 is a cross-sectional elevation view of another dressing;

FIG. 4 is a cross-sectional elevation view of another dressing;

FIG. 5 is a top plan view of another dressing;

FIG. 6 is a cross-sectional elevation view taken along line 6—6 of FIG. 5;

FIG. 7 is a cross-sectional elevation view of a foot in a shoe, the foot showing the conditions which are productive of a corn;

FIG. 8 is an enlarged cross-sectional elevation view through a corn on a foot;

FIG. 9 is a view similar to FIG. 8 showing the corn in an advanced state wherein the skin below the corn has ruptured;

FIG. 10 is a top plan view of yet another dressing according to this invention;

FIG. 11 is an elevation view showing the dressing of FIG. 10 applied to a toe over a corn; and

FIG. 12 is a view taken along line 12—12 of FIG. 11.

A dressing assembly 10 for a corn, bunion or foot callous, as shown in FIGS. 1 and 2 includes a sealed sterile package 11 within which is disposed a sterile dressing and protective appliance 12. The package preferably is made of paper treated to be impervious to air and to germs and the like carried in the air and on the hands of persons who handle the package. The dressing includes a base 13 which, as shown in FIG. 2, has an elongate strip-like configuration. The base is made of a flexible material which may be deformed to follow the contours of a foot to which the dressing is applied. Base 13 is made from an elastic fabric of the type used in the manufacture of "Elastoplast" adhesive coverlets by Duke Laboratories, Inc., of South Norwalk, Conn. As will be apparent from the following description, however, the base of dressing 12 may be made of inelastic fabric or synthetic film, if desired, without departing from the scope of this invention.

A soft sterile pad 14, preferably made of gauze, is mounted to a central portion of the base of the dressing. As shown in FIG. 1, the sterile pad of dressing 12 is mounted to obverse side 15 of base 13 centrally of the ends of the base strip. The sterile pad extends substantially across the width of the base strip. Preferably the sterile pad is adhered to a layer of pressure-sensitive adhesive 16 which covers the entire surface of the obverse side of the base; if the pad is otherwise secured to the base, the adhesive material covers the portions of the obverse side of the base not covered by the pad. The base strip extends from the opposite ends of the protective pad to define a pair of aligned tabs 17. A pair of protec-

tive backing strips 18 are releasably adhered to the adhesive material over the entire surface area of the tabs for protecting the adhesive material from contamination by foreign matter and for preventing the adhesive from coming into contact with and adhering to the adjacent surfaces of package 11. Each backing strip is carried by a respective tab and extends at least partially across the sterile pad into overlying relation with the adjacent end of the other backing strip. The backing strips have widths equal to the width of base 13.

A dressing according to this invention includes at least one pressure-relieving protective pad, made of a flexible material having limited compressibility, i.e., substantially incompressible, mounted to the base of the dressing adjacent the sterile pad. Dressing 12 includes two pressure-relieving protective pads 19 secured to the reverse side 20 of the dressing base at tabs 17. The protective pads are arranged so that they lie adjacent the sterile pad and are centered along the longitudinal centerline of the dressing. Each pad has an arcuately curved end 21 disposed away from the sterile pad convex to the end of the base. Each pad also has an arcuately curved end 22 disposed adjacent the sterile pad and concave to the sterile pad; the concave curvature of the ends of the protective pads adjacent the sterile pad permits the protective pads to be placed closely adjacent the sterile pad and provides increased effectiveness of the protective pads relative to a corn overlaid by the sterile pad when the dressing is in use. The protective pads preferably are made of dense felt having little compressibility and having a thickness of about one-eighth inch. The felt is of sufficient density that the maximum reduction in thickness of the protective pads during use of the dressing is not more than one-half the original thickness of the felt.

FIG. 3 shows another dressing 25 which is sold in a sterile condition within a sealed protective housing 11. Dressing 25 includes a base 13 fabricated either of an elastic fabric as described above, a non-elastic fabric, or a synthetic film material. The base has a strip-like configuration in that it is longer than it is wide. A sterile pad 14, preferably fabricated of soft gauze material, is secured to a central location of the base so that the base defines tabs 26 which extend from the opposite ends of the pad. A deformable pressure-relieving protective pad 19 is secured to the obverse side of base tab 26 closely adjacent to the sterile pad. Each protective pad has an arcuately concave end 22 open to the sterile pad. The surfaces of the protective pads opposite from the base are coated with a pressure-sensitive adhesive material 16; the pressure-sensitive adhesive material is also disposed over the obverse side of the base between the protective pads and the extreme ends of the base strip. A pair of removable backing strips 18 are releasably adhered to the pressure-sensitive adhesive material and extend from the opposite ends of the dressing to beyond the midpoint of the dressing. As a result, the backing strips are disposed in overlying relation to each other centrally of the sterile pad. When dressing 25 is to be used, it is removed from its sterile housing and the backing strips are peeled away from the pressure-sensitive adhesive material. The dressing is then applied to a toe so that the sterile pad overlies a corn and the pressure pads are adhered to the toe immediately adjacent to the corn to protect the corn from pressure by a shoe or the like.

FIG. 4 shows another dressing 30 according to this invention including an elongate strip-like base 31 having an obverse side 32 and a reverse side 33. The base of dressing 30 is fabricated from an impervious synthetic film which may or may not have elastic characteristics, although the use of a film having elastic characteristics is preferred. A soft sterile pad 14 is secured to the base centrally of its length so that the base has oppositely projecting end tabs 34 extending laterally from the base. Pressure-sensitive adhesive material 16 is disposed over the exposed areas of the obverse surface of base 31. A

single pressure-relieving protective pad 19, having an end 22 curved concave away from the pressure-relieving pad, is mounted to one of tabs 34 on the reverse side of the base. The pressure-relieving pad is positioned so that pad end 22 is disposed closely adjacent to, and opens toward sterile pad 14. A cover sheet 35, preferably fabricated of the same material as base 31, overlies the pressure-relieving and the sterile pads as shown in FIG. 3 and is secured to the base and the pressure-relieving pad. When the base and the cover sheet are fabricated of a synthetic film, it is preferred that both these components of the dressing be perforated, as at 36, adjacent the sterile pad for ventilation of the sterile pad. A pair of removable protective backing strips 18 are releasably adhered to the pressure-sensitive adhesive material and overlie the sterile pad as shown. Dressing 30 is marketed in a sealed sterile housing such as package 11.

FIGS. 5 and 6 show a dressing 40 which is particularly adapted for use on extremely large bunions and callouses, although it may be modified for use on corns without departing from the scope of this invention. The dressing includes an elongate flexible base 41 which is longer than it is wide, but wherein the ratio of base length to base width is lower than in dressings 10, 25 and 30, described above. Preferably the base is fabricated of an elastic synthetic material and has a perforated central area 42. A soft sterile gauze pad 43 is secured to an obverse side 44 of the base in the perforated central area of the base. The pad has a width substantially equal to, but slightly less than, the width of the base. The base defines end tabs 45, which extend in opposite directions away from the opposite ends of the sterile pad. A layer of pressure-sensitive adhesive material 16 is disposed over the entire extent of the obverse surface of the base at tabs 45. A pair of removable sterile pad and adhesive material protecting backing strips are removably adhered to the adhesive material and overlie the protecting pad as shown in FIG. 6. A pair of arcuately curved pressure-relieving protective pads 47, preferably fabricated of dense felt, are secured to the reverse side of base 41 at tabs 45 so that the protective pads lie closely adjacent to and are concave toward the sterile pad. The protective pads are removably adhered to the reverse side of the base by a layer of releasable adhesive material 46 disposed between the pads and the base tabs.

A first protective pad cover sheet 48, having a base edge of a width corresponding to the width of base 41 at the end of sterile pad 44 and a shape defining a tapered tab 51 opposite the base edge, is secured to the reverse side of the base adjacent each pad 47. Each sheet 48 has its base edge secured to the base immediately adjacent to each end of the sterile pad. The remainder of the cover sheet extends toward the remote end of the adjacent base tab over the adjacent pressure-relieving pad. A pair of second cover sheets 49, shaped substantially in conformation to the planform configuration of base tabs 45, are provided. Each sheet 49 has one edge thereof secured to the base at the extreme end of the dressing, as shown in FIG. 6; the second cover sheet extends towards the central portion of the dressing over the adjacent pressure-relieving pad. The end of each pressure-relieving pad disposed away from the sterile pad is spaced inwardly of the adjacent end of the dressing. A slit 50, see FIG. 5, is formed through the second cover sheet between the portion thereof which is secured to base 41 and the proximate end of the adjacent protective pad. The tapered tab end of the corresponding first cover sheet is passed through slit 50 so that the cover sheets may be interleaved to enclose the protective pad over which they extend.

Dressing 40, being adapted for use on a bunion or a foot callous, normally is applied to a foot in such a position that the dressing is subjected during use to considerable pressure and abrasion. For example, if the dressing were applied to the bottom of a person's foot and cover sheets 48 and 49 were not provided, the protective pads

would bear directly against the user's stocking and the pads would become abraded and worn sufficiently that their effectiveness in relieving the bunion or callous would be impaired. When such occurs, the natural body functions which cause the callous or bunion to heal cannot be effective. Cover sheets 48 and 49 provide the felt pressure-relieving protective pads with a protection from such abrasion and thereby enhance the utility of the overall dressing. The protective pads are relatively incompressible but, in use, they will be compressed sufficiently after a time to allow some pressure to be applied to the bunion or callous over which pad 44 is disposed. In view of the tab-and-slot interleaved connection of cover sheets 48 and 49, however, the pressure-relieving pads are accessible and may be replaced as desired without removing the basic dressing from the body.

FIGS. 7, 8 and 9 illustrate the development of a corn 55 on a toe 56 of a human foot 57, the foot being shown inside a shoe 58. When a corn or a hammertoe condition is exhibited by a toe, the toe is usually found to be in a flexed or semi-flexed state. The permanent nature of this condition is caused by the contraction of certain plantar muscles in the foot along the bottom or side of the toe. This permanent contraction of the plantar muscles causes the over-extension of two dorsal muscles in the toe, and these dorsal muscles become partially inactive and suffer a loss of tone. These conditions are most frequently caused by the continued use of ill-fitting shoes which cause the toe to flex into a position such that the plantar muscle contraction can occur. When such contraction occurs, the toe is caused to bear at a localized position against the interior of the shoe as shown in FIG. 7 in the area of corn 55. The continued application of pressure by the shoe against the toe causes the corn to develop.

A corn is a localized and exaggerated accumulation of dead skin over the dermis 59 (see FIG. 8) or vital skin layer. Normally the dermis regenerates itself at a relatively slow but constant rate, but when pressure is applied to a small area of the skin the regenerative processes in the dermis are accelerated in this area. If the pressure is not relieved for a sufficient time, as where a person wears ill-fitting shoes day-in and day-out, the dead skin produced in the dermal regenerative process is prevented from being removed, and this matter accumulates in a deposit known as a corn. As the corn grows, it causes the adjacent dermis to be depressed, as shown in FIG. 8. Ultimately the corn may become massive enough to cause the dermis to be ruptured below the corn, as shown in FIG. 9. When a dermal rupture occurs, the flesh adjacent the rupture may become infected, as shown at 60 in FIG. 9.

If the pressure upon the corn is relieved before the corn produces a rupture in the dermis, normal body processes cause the corn to break loose from the dermis in a matter of days. As noted above, unsterile, corn plasters previously available treated corns merely by relieving the pressure upon the corn so that these body processes could become effective to shed the corn. Where the dermal layer is ruptured, however, the use of an unsterile corn plaster may lead to infection if infection is not already present. The dressings described above, being sterile and kept in a sterile package until use, cannot aggravate or produce infection when used to treat advanced corns.

Prior plasters, being designed merely to relieve pressure upon a corn so that the body can shed the corn in response to natural processes, do nothing to correct the condition, i.e., permanent contraction of plantar muscles, which originally set the stage for the occurrence of a corn. Dressings according to this invention may be used to correct plantar muscle contraction while they relieve the pressure upon a corn.

A dressing according to this invention differs from presently available corn plasters by having a pronounced length; presently available plasters are essentially patches to be applied circumjacent a corn. The above-described dressings are applied so that the length of the dressing lies along the length of a toe on which occurs a corn to be treated. Such dressings are applied after the toe has first been moved from its flexed condition back toward the relaxed position of a normal toe. After the dressing has been applied, the restoring force on the flexed toe is relaxed. As the toe tends to return to its flexed state, tension is built up in the base of the dressing and this tension prevents complete return of the toe to its flexed state. By this means, the contracted plantar muscles are placed under tension and are induced to return to their normal condition. As a result, the use of the above-described dressings treats not only the corn but the condition which produces the corn so that the corn does not recur; such treatment is made more effective if the foot treated is also provided with properly fitting shoes.

The use of an elastic material, either fabric or a synthetic film, in the dressings described is preferred. Elasticity in the dressing base permits the dressing to be effective over a longer period as the toe moves to an unflexed state than if an inelastic material is used for the dressing base.

In cases where plantar muscle contraction is extreme and adhesive material 16 does not adhere to the toe being treated sufficiently securely to withstand the shear forces developed in the adhesive by the force tending to move the toe back to its flexed state, dressing 65, shown in FIGS. 10–12, may be used to advantage. The dressing is housed prior to use in a sealed sterile package 11. The dressing includes an elongate, strip-like base 66. The base preferably is made of a quantity of elastic fabric or synthetic film, although an essentially inelastic fabric or film may be used. A soft sterile pad 67 is secured to the obverse side of the base centrally of the length of the base. The base defines a pair of tabs 68 extending in opposite directions from the sterile pad. A pair of pressure-relieving pads 69, each having an outwardly convexly contoured end surface 70 adjacent the sterile pad, are mounted to the tabs closely adjacent the opposite ends of the sterile pad. The obverse surfaces of the tabs are covered with pressure-sensitive adhesive material 16.

Dressing 65 as described and illustrated is similar to dressing 10 described above, but it may be modified to resemble dressings 25, 30 or 40, if desired, without departing from the scope of this invention. Such modified forms of dressing 65 are not described in detail or illustrated to simplify the presentation of this invention; also, such modifications are readily apparent from the foregoing description.

Each tab 68 of dressing 65 defines a pair of extensions 72 which are formed integral with the table from the base material and which extends in opposite directions from the opposite edges of the base substantially normal to the length of the base. The adhesive material which covers the obverse surfaces of the tabs is also present over the obverse surfaces of the tab extensions. When the dressing is applied to a deflected, normally flexed toe over a corn, such as to toe 56 as shown in FIGS. 11 and 12, the tab extensions extend around the toe. The tab extensions results in the dressing being affixed to the toe in such a manner that the forces which tend to return the deflected, partially straightened toe to its flexed condition are overcome by the dressing without the dressing slipping on the toe.

A distinct disadvantage of the circular corn pad is that it causes the corn to pop up through the hole of the pad and thus temporarily increases the raise of the corn due to swelling or edema of the tissues involved. This in turn forces more pressure to be applied on the corn by the shoe. The dressings described above prevent the corn from raising by the use of either the single or double protective pad which allow space for tissue fluids to escape or flow evenly thus preventing the "pop up" effect or the edema.

My invention has been described above with reference to certain physical embodiments selected and described for the purposes of illustrating the invention rather than

of limiting the scope of the invention. Modifications and alterations of these embodiments within the scope of the invention will be apparent to workers skilled in the art to which the invention pertains. Accordingly, the foregoing description is not to be regarded as limiting the scope of my invention.

What is claimed is:

1. A sterile dressing comprising a flexible base having an obverse side and a reverse side, a sterile pad sized to cover an area of the body of selected size secured to the base substantially centrally of the base, a protective pad fabricated of a deformable material having limited compressibility mounted to the base adjacent the sterile pad for protecting a body area overlaid by the sterile pad from pressure by a shoe and the like, a layer of adhesive material disposed over the observe side of the base at least adjacent the sterile pad, protective sheet means releasably adhered to the adhesive material over the extent of said material, and a sealed package housing the above-mentioned components of the dressing in a condition of sterility until use of the dressing.

2. A dressing according to claim 1 wherein the sterile pad is secured to the obverse side of the base and the base defines a pair of tabs extending in opposite directions along the length of the base away from the sterile pad.

3. A dressing according to claim 2 wherein the protective pad is fabricated of felt sufficiently dense that the maximum reduction in the thickness thereof by compression during use of the dressing is not more than one-half the original thickness of the felt.

4. A dressing according to claim 2 wherein the protective pad is mounted to one of said tabs and has an end adjacent the sterile pad curved transversely of the base concave to the sterile pad.

5. A dressing according to claim 4 wherein the base is fabricated of an elastic material.

6. A dressing according to claim 4 including a pair of pad extensions for each tab defined by the base and extending in opposite directions transversely of the length of the base from each tab, each extension having an obverse side having said adhesive material disposed thereover.

7. A dressing according to claim 4 including a second protective pad similar to the protective pad mounted to the one tab, the second protective pad being mounted to the other tab adjacent to the sterile pad.

8. A dressing according to claim 4 wherein the protective pad is mounted to the reverse side of the base.

9. A dressing according to claim 8 including cover means overlying the protective pad and secured to the reverse side of the base for protecting the protective pad from abrasion during use of the dressing.

10. A dressing according to claim 9 wherein the protective pad is mounted to the reverse side of one tab in spaced relation to the end of the tab opposite from the seterile pad, and the cover means includes a first cover sheet secured to the reverse side of the base between the protective pad and the sterile pad and overlying the protective pad, a second cover sheet secured to the reverse side of the base adjacent the end of the one tab and overlying the protective pad, and means for releasably interleaving the cover sheets.

11. A dressing according to claim 10 wherein the protective pad is releasably adhered to the base.

12. A dressing according to claim 4 wherein the protective pad is mounted to the obverse side of the base, the side of the protective pad opposite from the base being covered with said adhesive material, and wherein the protective sheet means extends over the protective pad and is releasably adhered thereto.

13. A dressing according to claim 4 wherein the protective pad is realasably adhered to the reverse side of the base.

14. A method for simultaneously correcting contraction of plantar muscle in a flexed toe and treating a corn on the side of the toe opposite from said plantar muscles including the steps of

(a) providing an elongate adhesive dressing including a sterile pad and a thickened protective pad for relieving pressure upon the corn,

(b) moving the toe at least partially from its flexed position to its normal position to at least partially extend said contracted muscles,

(c) applying a holding constraint to the moved toe,

(d) applying the dressing in its elongate state to the held toe along the length of the toe on the side of the toe opposite from said muscles so that the sterile pad overlies the corn, and

(e) removing the holding constraint from the toe so that the dressing is placed in tension and prevents full return of the toe to its flexed position.

15. A method according to claim 14 wherein the dressing provided is elastic in the direction of its length.

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