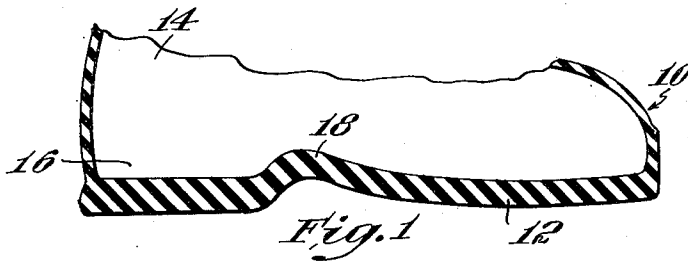
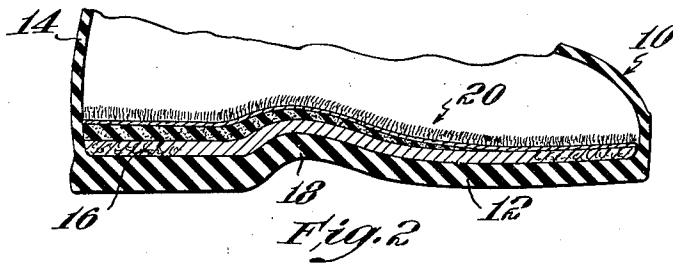
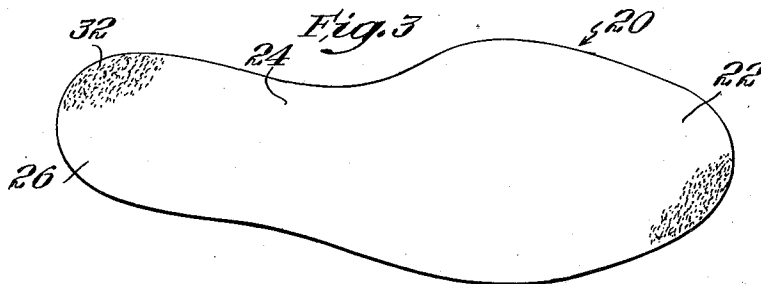
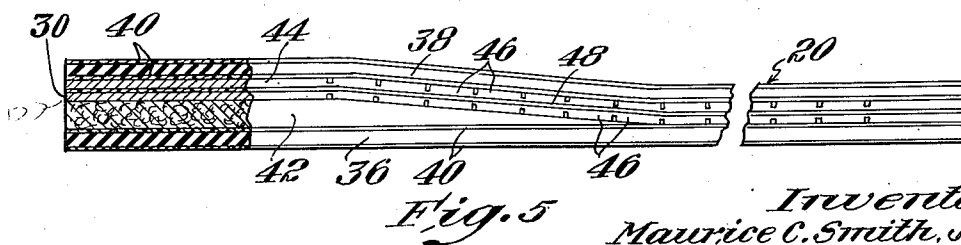


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SLIP SOLES FOR CONVERTING OVER-THE-SHOE
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SLIP SOLES FOR CONVERTING OVER-THE-SHOE BOOTS TO OVER-THE-FOOT BOOTS

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2 Claims. (Cl. 36—44)

This invention relates to slip soles and more especially to slip soles particularly adapted for use with over-the-shoe boots, such as employed by the military personnel, trappers, hunters and others where prolonged exposure to extreme cold and wetness is expected.

Boots are generally constructed either to be worn with the shoes (over-the-shoe boots) or without shoes (over-the-foot boots) and in each case if worn other than intended are extremely uncomfortable, inevitably resulting in leg fatigue and blistered feet. The principal object of this invention is to provide means which may be associated with an over-the-shoe boot which will make it convertible to over-the-foot use. A further object is to provide a device in the form of a removable slip sole insertable in an over-the-shoe boot to convert it to over-the-foot use. Further objects are to provide slip soles of the foregoing kind which are durable, will afford comfort and warmth, will resist moisture, but will not induce perspiration, which are resistant to wrinkling, that is will not creep or bunch, which will not spread laterally so as to become enlarged, and which have sufficient body and stiffness to retain their place in the boots without the use of attaching means.

As herein illustrated the slip sole has a forepart of substantially uniform thickness and a rear part of increased thickness, the thickness of the rear part being sufficient to compensate for the absence of a heel lift where the boot is worn without benefit of a shoe to elevate the heel of the foot to normal heel level and is comprised of a material which is a good heat insulator. The sole is made up of a number of layers laid on each other and united for example by adhesive to form an integral unit. An intermediate one of the layers of which the sole is made of is comprised of a material which is flexible in at least one direction but is substantially resistant to lateral extension and may preferably be a woven fabric such as duck, or a thin layer of leather. Where longitudinal flexing is desired without transverse flexing the inextensible layer is made of narrow strips of wood joined to hinge transversely so as to permit longitudinal flexing but to inhibit transverse flexing. Elevation of the heel end is attained by interposing a lift between the layers at the back part. The lift may be wedge-shaped material such as sponge rubber or felt, may extend from the ball line to the heel end and may be wedge-shaped throughout its length so that the sole increases in thickness uniformly from the ball to the heel or throughout only the shank so that the sole increases the thickness from the ball to the breast line of the heel, the forepart and heel then being of different but of substantially uniform thickness. The facing layers are comprised of material suitable for contact with the bottom of the boot and the bottom of the foot respectively, the latter preferably being of cushioning material which will conform to the profile of the bottom of the foot. The facing layers may be respectively felted material and fleece or alternatively sponge rubber faced with duck.

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The invention will now be described in greater detail with reference to the accompanying drawings wherein:

Fig. 1 is a vertical section through a boot, the upper part having been omitted showing the contour of the inside of the bottom of the boot;

Fig. 2 is a vertical section corresponding to that shown in Fig. 1, with the slip sole which constitutes the subject matter of the present invention inserted therein;

Fig. 3 is a plan view of the slip sole;

Fig. 4 is a side elevation of one form of the slip sole; and Fig. 5 is a side elevation of an alternative form.

Referring to the drawings, there is illustrated in Figs. 1 and 2, a heavy boot 10, constructed of leather, rubber or a combination of these and canvas, such as are ordinarily used by military personnel, in latitudes of extreme cold and/or wet. The boot has a thick rubber or composition sole 12 impervious to water, an upper 14 of equally water resistant material and is ordinarily expected to be worn over the shoe, that is the boots will be worn in addition to the conventional shoes so as to provide additional warmth and water resistance in extremely cold climates. At times, however, it is desirable to wear boots without shoes, for example to rest the feet or when the temperature is such that the feet would be uncomfortably warm when wearing both the boots and shoes and yet the terrane is wet enough so that it is necessary to have more protection than would ordinarily be afforded by shoes. The conventional over-the-shoe boot as illustrated in Fig. 1, has a rather deep heel pocket 16, divided from the forepart by a pronounced upwardly convex shank 18. The pocket or cup is adapted to receive the heel of the shoe since otherwise the foot would be thrust upwardly to an uncomfortable and awkward position and both the bottom of this cup and the bottom of the forepart of the boot are finished roughly, that is without much regard to flexibility or softness for receiving the bottom of the unprotected foot. When such boots are worn without shoes the heel is deprived of support since the bottom of the cup 12 is below the normal level of the heel. The result is that the underarch or instep of the foot rests on the upwardly convex shank 18 so that the foot is fulcrumed at the astragalus which is substantially the junction of the scaphoid which is the first bone element at the forepart of the foot and the os calcis which is the heel bone. The affect of concentrating the entire weight at the astragalus is to cause the heel to tip downwardly and to spread the forepart of the foot with reference to the heel thus exerting a painful pull on the muscles of the legs so that any prolonged marching under such conditions is impossible. Moreover, the balancing of the foot at the instep tends to instability and hence movement of the foot forwardly and rearwardly with each step thus setting up constant rubbing of the foot on the bottom and sides of the boot and since the inside of the boot is not fashioned for contact with the unprotected foot, blistering and bruising of the foot inevitably follows.

The insole unit which forms the subject matter of this invention is adapted and constructed to be placed in a boot such as illustrated in Figs. 1 and 2, to convert it from on-the-shoe use to on-the-foot use in such a manner that it will embody all the comforts of a boot constructed specially for on-the-foot use. The novel insole 20 when placed in the boot as shown in Fig. 2 covers the forepart of the boot bottom, extends over the arch and fills the cup 16, so that the foot supporting upper surface is elevated at the heel sufficiently to compensate for the lack of a heel lift and its forward or foreportion is smooth and cushions the foot from the harsh bottom surface of the boot. No abrupt change in level occurs at the shank and hence the foot does not fulcrum at the shank but rests firmly at two points namely the heel and ball as it should

for normal comfort and correct weight distribution. As illustrated in Fig. 3, the novel insole 20 is of conventional shape having a forepart 22, a shank 24 and a heel part 26. The insole is laminated in construction and consists of a bottom layer 28, an intermediate layer 30, a top layer 32 and an insert or lift 34 interposed between the layers and extending from approximately the ball of the foot rearwardly to the heel. In the form shown in Fig. 4, the bottom layer 28 is comprised of a heavy felt of animal fibers which is dense enough to afford considerable resistance to moisture and to be a good insulator. This layer is preferably, approximately six (6) irons thick, however, the thickness may be varied depending upon the warmth and cushioning effect desired. Preferably the felt layer should be of such density as to resist lateral spreading and to afford good wear resistance where it contacts the bottom of the boot. The intermediate layer 30 is preferably substantially inextensible laterally, that is transversely and longitudinally and in this instance comprises the skin of a sheep which still has attached to it the fleece, the latter forming the upper or exposed surface layer 32. The skin may or may not be reinforced with a woven material such as duck to add resistance to lateral extension. The insert or lift 34 is sponge rubber and is placed between the layers 28 and 30 whereupon the layers are cemented securely together to form a unitary structure. As illustrated the insert is wedge-shaped so that the top layer is inclined upwardly from approximately the ball line of the forepart to the heel. The thickness of the wedge may be varied according to the construction of the boot with which it is to be used and will be determined to some extent by the depth of the heel cup in the boot and should be thick enough to raise the level of the foot engaging portion to compensate for the absence of the heel lift.

The insole as thus constructed has sufficient flexibility so that when it is placed in the boot the heel end will take up the full depth of the cup and yet its upper surface will extend smoothly from the heel end forwardly over the shank into the forepart without abnormal changes in the surface contour and so that the foot will be afforded its normal two point support. The fleece layer 32 affords softness and conformability to the profile of the bottom of the foot, cradling it and affording warmth without causing perspiration. The composite unit is of sufficient body so that it may be inserted in the boot without need for attaching means, will stay in place without wrinkling or bunching when the foot is shoved into the boot and will not fall out of the boot when the foot is removed.

The kind of material used for the respective layers of the insole may be varied, an alternative construction being shown in Fig. 5 wherein the bottom layer 36 and the top layer 38 are comprised of sponge rubber, faced with duck 40. The wedge-shaped piece 42 is in this case felt and the inextensible intermediate layer 30 is comprised of a series of transversely extending thin strips of wood 46 attached to the opposite sides of a flexible piece of duck 48 so as to form a member which is hinged transversely and may be bent longitudinally but is not flexible transversely. This construction while not as comfortable and not affording the warmth of the previously described insole is preferable where warmth is not desired as much as resistance to moisture and foot support. The transverse stiffness affords a firm support for the foot minimizing tendencies to turn the foot when walking on rough ground. The insert or lift 42 illustrated in Fig. 5 in contrast to that shown in Fig. 4, increases in thickness throughout the shank portion only, the heel end thereof being of uniform thickness so that the forepart and heel of the sole are of uniform but different thickness. It is to be understood, however, that this insert may be of the same construction as that shown in Fig. 4 that is, uniformly increasing in thickness from

the ball to the heel and that in like manner the insert 34 shown in Fig. 4 may be made like the insert 42.

The insoles constructed as shown in Figs. 4 and 5, are exemplary and may be varied without departing from the scope of the invention so long as the essential features are maintained, that is leveling the foot contacting surface of the inside of a boot designed for wear with shoes, to provide a foot contact surface which is of normal contour and to provide a support for the foot which is comfortable, imparts warmth and is resistant to moisture.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. For use in combination with an over-the-shoe boot having a sunken heel recess, a slip sole adapted to cover the entire inside bottom part of the boot, said slip sole comprising an intermediate layer which is longitudinally flexible and has continuous spaced parallel structural elements distributed in spaced parallel relation longitudinally thereof, which are substantially inextensible transversely of the layer, thereby forming a base of substantially fixed transverse dimensions for constraining spreading of the slip sole, a bottom layer of laterally yieldable, resilient material, said bottom layer constituting an impressionable cushion which will conform to the contour of the shoe bottom without transferring the impression to the intermediate layer, said bottom layer being water-resistant, wear-resistant and a good heat insulator, a top layer having a soft surface adapted to take the impression of the bottom of the foot, a yieldable wedge interposed between the bottom layer and the intermediate layer and extending from the heel end to approximate the ball line and adhesive means bonding the layers at the interfaces so as to constitute a composite laminate.

2. For use in combination with an over-the-shoe boot having a sunken heel recess, a slip sole adapted to cover the entire inside bottom part of the boot, said slip sole comprising an intermediate layer of woven duck with spaced transversely extending wooden slats adhesively fastened to its opposite surfaces, a bottom layer of sponge rubber faced on both surfaces with woven duck, a top layer of sponge rubber faced on both surfaces with woven duck, a strong dense felt wedge interposed between the bottom and intermediate layers at the heel end, said wedge extending from the heel end to approximately the ball line and adhesive means uniting the interfaces of the layers so as to constitute a composite laminate.

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