

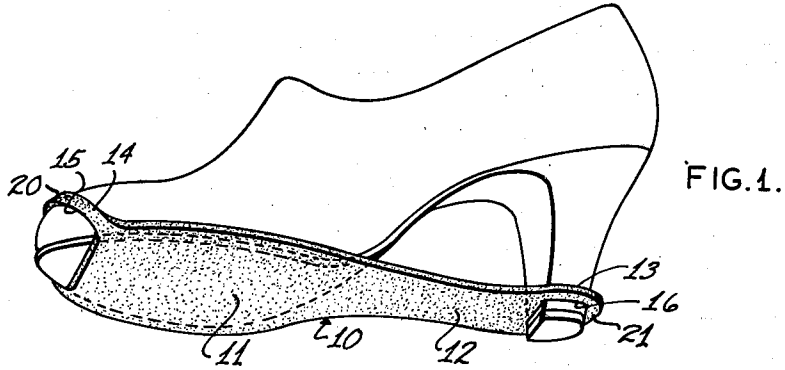
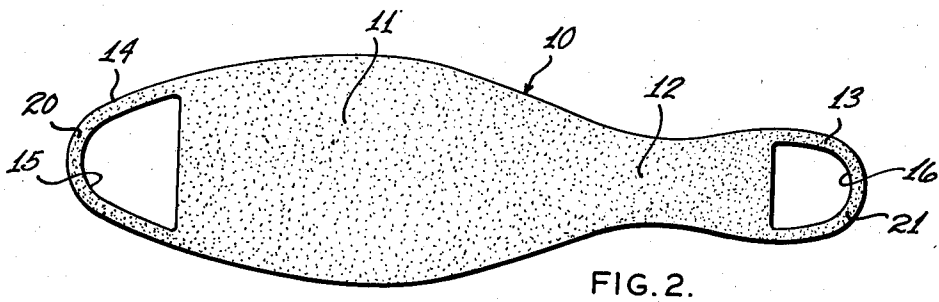
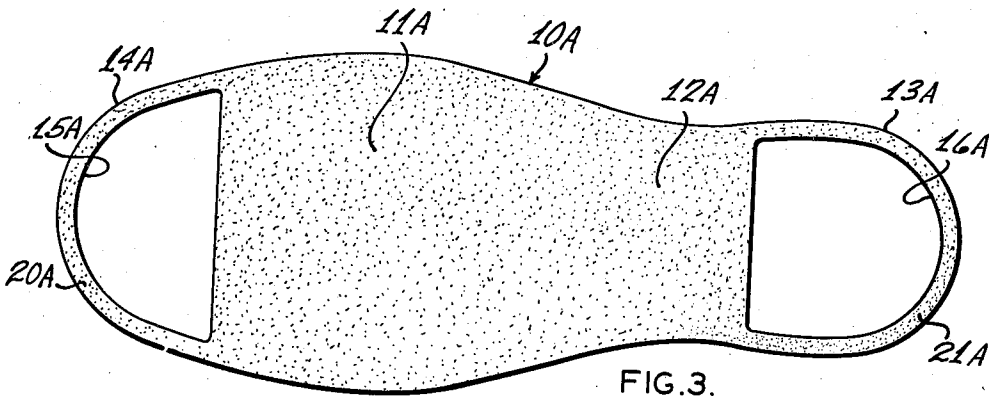
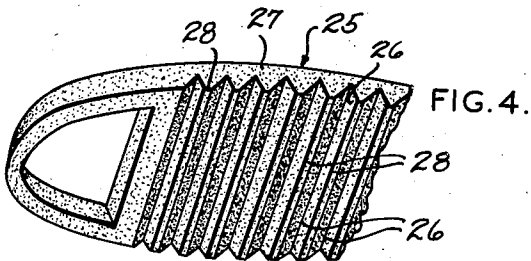
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P. L. LAZARUS

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FOOT-BALANCING AND CUSHIONING MEANS

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BY

INVENTOR.
PETER L. LAZARUS
Robert B. Terry
ATTORNEY.

UNITED STATES PATENT OFFICE

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FOOT-BALANCING AND CUSHIONING
MEANS

Peter L. Lazarus, St. Louis, Mo.

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12 Claims. (Cl. 36-7.5)

This invention relates to improvements in foot-balancing and cushioning means, and particularly to a quickly detachable outer sole element for application over the wearing surface of shoes.

Among the more important objects of the invention, may be noted the provision of a quickly attachable and removable cushioning element of low cost, which is structurally simple in design, serving the purpose of a foot-balancing expedient tending to keep the foot bones in optimum balance for walking with a minimum of foot fatigue. This object includes a provision for remedying and relieving foot calluses, particularly those on the lower ball portion of the foot.

Somewhat related to the foregoing object, is the provision of a foot-balancing device having improved cushioning properties which, by reason of eliminating foot fatigue and calluses, tends to keep the bones of the leg and back of the wearer in more nearly correct position and tends to promote correct standing posture, all with a markedly beneficent effect, through minimization of fatigue, on general health.

Further objects include the provision of a quick detachable outer sole element for shoes, which serves as an effective cover or reinforcement for sole openings or thin portions on the ball part of the outer sole of the shoe; a provision of the device of the type noted, which is retained on the shoe below the outer sole, under an appreciable tension, and thus tends to lift the shank and the arch supporting portion of the shoe and to restore the shoe to its original shape.

Still further objects include the provision of a quick-detachable auxiliary outer sole element for shoes which, because of its resilience, is self-conforming to irregularities of the floor, paving or other surfaces encountered in walking or standing.

Yet an additional object is attained in an improved ease of removal and detachment of an auxiliary outer sole; one which may be conveniently formed at very low cost of a single piece of sheet stock of compounded rubber or rubber-like material, and one which comprises integral straps for securing the device to the heel and toe portions of the shoe.

More or less ancillary objects may be noted as a possibility for providing, at a low cost, a quick detachable, substantially water-tight sealing element, suitable for application over worn soles, and one which may optionally be formed to possess distinctive anti-slippage properties

and, if so desired, serve the purpose of an ice creeper or the like.

Numerous other objects and advantages of the invention will appear from the following detailed description of certain preferred embodiments, considered in connection with the drawing, in which:

Fig. 1 is a bottom view, shown in perspective, of a shoe to which a device embodying the present improvements is applied; Fig. 2 is a plan view of the detachable outer sole or foot cushion, in a form adapted for use with women's shoes; Fig. 3 is a view similar to Fig. 2 but showing the device in plan, in a form adapted for use on men's shoes, and Fig. 4 is a fragmentary elevation in perspective, showing a modification of the device to enhance its anti-slippage properties.

Referring now by characters of reference to the drawing, the device is conveniently formed up as by cutting, as with a die or dies, each embracing a suitable range of sizes, a strip of sheet rubber stock so that the resulting cut-out element conforms generally in shape to the outline of the sole of the shoe to which it is to be applied. After die-cutting or otherwise forming the sheet of material, there results the detachable outer sole or cushioning element indicated generally at 10, and characterized by a portion of maximum width across and underlying the ball portion of the shoe and outer sole, and indicated at 11. By preference the width across the ball portion of the device is somewhat less than that of the outer sole of the shoe proper, and by preference the length of the formed strip 10 is also somewhat less than that of the outer sole to which it is applied, for reasons hereinafter appearing.

Rearwardly of the ball area 11, the cut strip constituting the device is of a lesser width to constitute a tension connecting portion or neck 12, and proceeding further toward the heel part of the outer sole element 10, the heel-engaging portion indicated at 13 is widened somewhat in comparison with the connecting strip 12.

Proceeding from the ball portion 11 to the fore or toe end 14 of the outer sole element, the formed strip is of a somewhat reduced width substantially as shown, and in conformity with the outer sole outline substantially as illustrated.

Somewhat inwardly of the tip or toe portion 14, there is formed, as by cutting or die punching, a preferably D shaped opening 15, the major axis and rear margin of the opening being of a trend substantially transversely of the fore part of the detachable sole element. At the opposite

end of the detachable outer sole is an opening indicated at 16, and which, by preference, is substantially D shaped, having its foremost margin substantially rectilinear and its remaining portion substantially continuously curved so as to result in the shape shown. As will later appear, the purpose of this shaping is to enable the opening 16 to receive the heel of the shoe to which the device is attached.

It will have appeared, and the advantages become more apparent in considering the mode of application of the device to the shoe, that the location and shaping of the opening 15 results in the formation of what may be called an integral strap portion 20 which in the device as formed, is co-planar with the remainder of the flat strip of material constituting the outer sole. Similarly the neck of material lying just rearwardly of the opening 16, and defined in part thereby, serves as an integral securement strap 21. The shaping of the openings 15 and 16 has been arrived at as a result of numerous experiments in order to obtain a strap portion of necessary width and one which, when tensioned over the toe or heel of the shoe as the case may be, will lie closely and flatly over the portion of the shoe engaged thereby, and will grip such part of the shoe at an angle tending to prevent slippage of the strap portion from its original position of placement. The design arrived at as to shaping of the openings 15 and 16 and strap portions 20 and 21 has further been selected so as to maintain a minimum width and section of such strap portions throughout their lengths.

The device, which may be referred to as a detachable outer sole, is by preference formed of a sheet material as above mentioned. The principal advantage in my preference for a distinctly stretchable sheet material having both high tensile strength and marked cushioning properties, is partly due to the fact that such stocks generally possess better aging properties and retain their strength over a longer period of time than most of the more highly loaded molded stocks. There is, of course, a distinct economical advantage in the use of sheet material, in that many more of the articles may be produced in a given time with given fixed charges for equipment, than is the case with molded articles. A further preference for the use of sheet or strip stock, is found in that the protective devices formed thereof, when not in use, may be readily rolled or folded and carried in the pocket or purse in a compact package; for example, the unit may be rolled from its toe end to its heel end, and the strap portion 21 be stretched over the roll to keep the unit in compacted or packaged form. It is one of the purposes of the present invention to provide a low-cost quickly attachable article of the kind noted, for use by charitable organizations in the larger metropolitan centers, particularly during the winter months, and in keeping with this purpose the lower cost of the sheet material is of extreme importance.

As a preference for the rubber stock utilized for the outer sole when produced for sale to shop girls, retail clerks and others in standing or walking occupations, it is a preference to employ a very finely cellular, compounded rubber stock, in which the cells are so small as to be barely visible except upon close inspection, and which is referred to in the trade as sheet sponge rubber. Since no very great thickness of this stock is necessary or required, preferably for the

purpose last noted, it has been found satisfactory to utilize a sheet say of one-eighth ($\frac{1}{8}$) inch in thickness when uncompressed. For other purposes, such for example as the noted use for weather protection for thin or worn soles, as in distribution to charity centers, and the like, the device may be formed up of sheet material derived from used automobile inner tubes, which stock, unless too badly aged, serves most effectively as a weather seal against the entrance of slush, rain and snow through the open or worn areas of the outer soles, particularly of men's shoes.

As to the various stocks of rubber-like material possible for use in forming the detachable outer soles, it is not desired that the foregoing description be regarded as limiting, since the device may be formed of a number of different compounded or vulcanized materials embodying natural rubber, or for use in certain industries where subject to solvent action, for example in connection with petroleum products, the deleterious solvent action may be obviated in substantial measure by the use of certain of the synthetic rubbers, such as Duprene or Ameripol.

The description thus far will apply equally to the detachable cushioning elements as utilized either with women's or men's shoes. In the drawing the reference numerals thus far applied are indicated with reference to women's shoes, but corresponding reference numerals bearing the suffix letter "A" will serve to distinguish the corresponding parts in views relating to the device as employed to men's shoes.

The manner of usage and mode of application of the device to, and its removal from the shoes, are thought to have been fully apparent from the foregoing description of parts, but it may be noted as a preferred practice in attachment, first to insert the toe portion of the shoe, presented from the upper surface of the outer sole, through the opening 15 to an extent to bring the strap portion 20 about to the margin of the shoe cap, the strap portion being then levelled down onto the cap. The cap will then positively engage this reinforced area of the shoe without noticeably cramping or restricting the toes of the wearer in any way. The outer sole 10 is then grasped and rearwardly tensioned, preferably by the heel portion, say the heel opening 16, which opening is inserted over the bottom end of the heel to bring the heel therethrough, following which the securement strap portion 21A, in the case of men's shoes, is brought upwardly at least over the rear portion of the heel proper, but if desired may be brought up to a position to overlie the rear quarters of the shoe. The application is the same in the case of ladies' shoes, except that with high heels the strap portion 21 usually overlies and snugly frictionally grips the heel proper somewhat below the rear quarters of the shoe.

A substantial number of experimental usages of the detachable outer sole by sales persons and others heretofore afflicted with foot bone ailments, and in some cases with physical ailments identified with the leg and back bones, have been found markedly to improve such conditions, and in many cases have fully overcome the ailments after a regular period of use of the device as described. This corrective and remedial effect has been found to be due in substantial measure to the relief of calluses and out-of-balance foot conditions due to the self-levelling and cushioning effect afforded by the high resilience of the

device, particularly when formed of sheet sponge stock. The relief attained is also due in large measure to a better alignment and more natural position of the toes of the wearer and to the cushioning effect provided for the metatarsal bones, the effect being most pronounced in cushioning the zone or area below the ball portion of the foot.

Briefly referred to in the objectives of the invention, was its possibility of use as a quick detachable, low cost ice creeper or anti-slip attachment. This result may be attained without impairing the numerous advantages heretofore mentioned, and in a sheet material, by using a somewhat thicker section of strip or sheet material, as shown in Fig. 4 and indicated at 25. In this embodiment the shaping and securing provisions may be the same as described above, but the anti-slip property is preferably enhanced by cutting a series of V shaped transverse grooves 26 across the lower surface of the widened portion 27 underlying the ball of the foot. The relatively close spacing of the grooves 26, results in intervening ribs 28, which serve to enhance the frictional engagement of the device with a wet or slick surface.

Although the invention has been described by making a somewhat detailed reference to certain preferred embodiments, the detail of description is to be understood as illustrative, and not as limiting the invention, many changes being possible within the scope of the appended claims.

I claim as my invention:

1. A foot-balancing and protective device for application over the outer sole of a shoe, and consisting of a length or strip of a resilient sheet material provided with an integral strap portion on its forward end, arranged to be passed over the toe or cap portion of the shoe to which the device is applied, and means at the rear or heel end of the device for securing it to the heel portion of the shoe, the initial length of the strip being less than the corresponding dimensions of the shoe, and such that the strip is positioned on the shoe under a distinct tension lengthwise of the shoe.

2. A device for application over the outer sole of a shoe, consisting of an elongate piece of elastic sheet material, apertured near its forward end, and thereby adapted, when the toe of the shoe is inserted through the aperture, to provide an integral strap portion overlying the fore quarters of the shoe, and provided near its rearmost end with means for securing such end to the heel portion of the shoe.

3. A device for application over the outer sole of a shoe, consisting of an elongate piece of compressible sheet material of substantially uniform thickness throughout, apertured near its forward end to provide, forwardly of the aperture, an integral portion, adapted when the toe of the shoe is inserted through the aperture to constitute a securement strap overlying the cap of the shoe, the device being provided near its rearmost end with means for securing such end to the heel portion of the shoe, the device being shaped in plan in substantial accordance with the shaping of the outer sole and being of greatest width across and below the metatarsal region of the foot.

4. A device for application over the outer sole of a shoe, and consisting of an elongate element of sheet cushioning material apertured near its forward end to receive the toe of the shoe through

such aperture, the aperture being located to provide an integral strap portion adapted to overlie the toe portion of the shoe, and the rear end of the piece of material being apertured to provide a strap portion rearwardly of the aperture and at the rear extremity of the device, adapted to embrace the heel portion of the shoe.

5. A detachable cushioning outer sole for shoes, consisting of an elongate strip of highly cellular rubber-like material apertured just inwardly of its forward extremity, and apertured just inwardly of its rear extremity, the apertures being formed respectively to receive the toe portion and the heel of the shoe, and to provide endwise beyond the respective apertures, elastic elements adapted to be stretched over the heel and toe respectively for anchorage of the device to a shoe.

6. The combination recited in claim 5, further characterized in that the heel-receiving opening is formed to provide a substantially rectilinear forward margin of the opening, the remainder of the opening being outlined by a curvilinear margin whereby the opening is adapted to conform to the transverse configuration of a shoe heel.

7. The combination recited by claim 5, further characterized in that the toe-receiving opening is distinguished by a rectilinear inner margin and a curvilinear remaining margin, such that the opening conforms substantially in shape to the transverse sectional outline of the toe portion of the shoe with which the device is to be used.

8. In a device of the type and for the purpose described, a body consisting of a high stretchable and compressible stock of rubber-like sheet material, outlined to conform approximately to the shape of the outer sole of the shoe with which the device is to be used, and provided slightly inwardly of each of its ends, with openings of substantially D shape, adapted respectively to receive the toe portion and the heel portion of the shoe.

9. In a device of the type and for the purpose described, a body consisting of finely cellular sheet sponge rubber, outlined to conform approximately to the shape of the outer sole of the shoe with which the device is to be used, and provided slightly inwardly of each of its ends, with openings of substantially D shape, adapted respectively to receive the toe portions and the heel portions of the shoe.

10. A detachable outer sole for a shoe, consisting of a strip of sheet rubber stock having a substantial stretch when tensioned, the strip being of a contour approximating that of an outer sole of a shoe, and provided with toe and heel receiving openings, the openings being spaced somewhat more closely together than the toe and heel portions of the shoe to be engaged thereby, whereby the device when applied to a shoe is tensioned substantially exclusively in the direction of the length of the shoe, and tends to maintain the outer sole and the heel surface of the shoe substantially in a common plane, with the fore quarters of the shoe and shank appreciably tensioned.

11. A quick-detachable appliance for use on the outer sole of a shoe as a foot leveling device, said device being formed of a strip of extensible and compressible rubber-like material, the strip being apertured just inwardly of its ends to form an integral heel strap and an integral toe

strap, the apertures being so located with respect to the strip that the device is tensioned primarily lengthwise of the shoe when applied thereto, and the strip being of substantially greatest width across the ball part and beneath the heel portion of the foot.

12. A quick-detachable outersole and foot leveling appliance for use with a shoe, consisting of a sheet or strip of rubber or the like formed

to provide integral heel and toe embracing portions, said device being formed entirely of a relatively thin sheet material having substantial cushioning qualities, adapted to be readily folded or rolled for carrying, the sheet material constituting the device being of substantially uniform thickness.

PETER L. LAZARUS.