

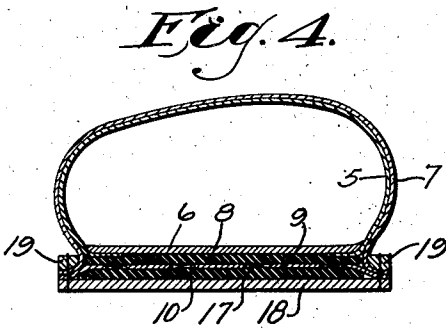
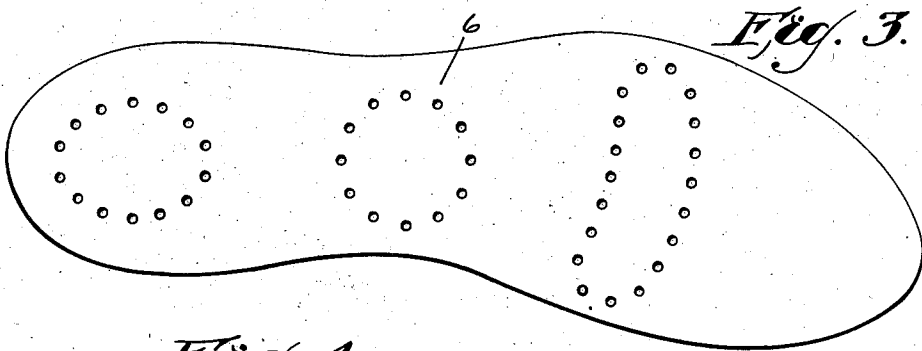
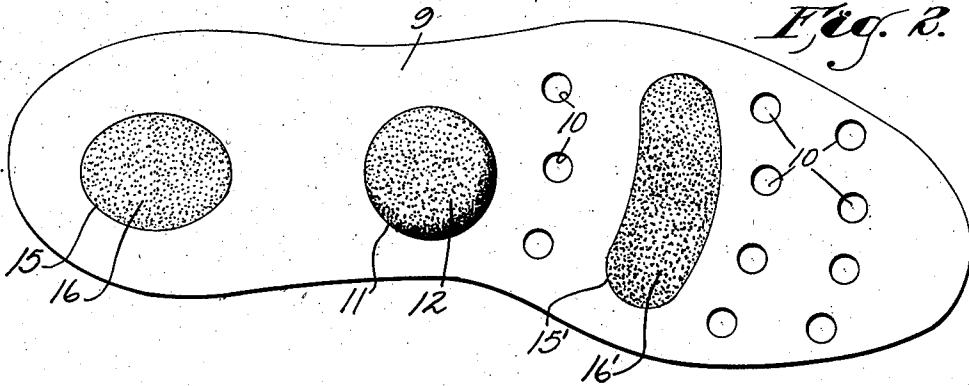
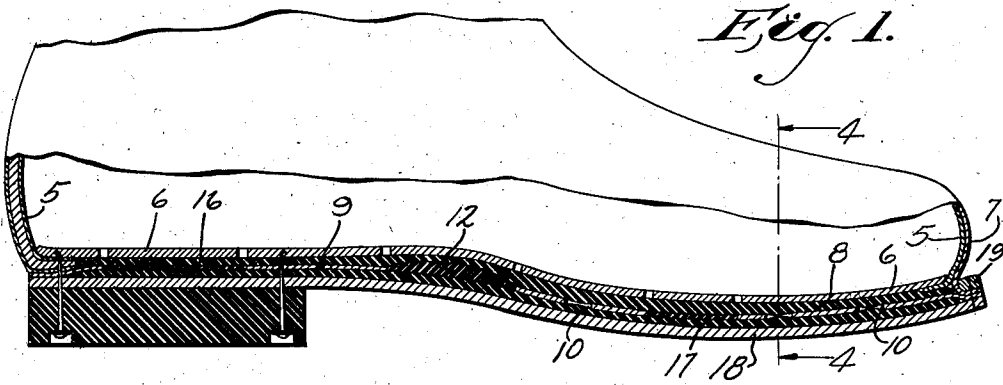
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CUSHION SHOE

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CUSHION SHOE

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11 Claims. (Cl. 36—28)

This invention relates to improvements in cushion shoes.

It is the object of the present invention to provide a satisfactory organization whereby a stitch-down shoe may be cushioned.

In ordinary shoes of the Goodyear welt type there is a space attributable to the in-seam ridge between the insole and the outsole, and in this space a cushion may readily be accommodated. In the stitch-down shoe there is no such space, and the provision of a thick cushion in such a shoe has therefore offered a difficult problem. I have found it practicable to cushion the sole of a stitch-down shoe by using two extremely thin plies of cushioning material, one of which is above the middle sole and the other beneath it, thereby avoiding undue bulkiness at either point and achieving certain other objectives of this invention.

It is very common for the soles of stitch-down shoes to squeak badly. I have found that by using two extremely thin plies of sponge rubber or other yieldable cushioning material to separate the several soles of a stitch-down shoe all squeaking may be eliminated, the yieldability of the cushioning plies between each pair of soles being sufficient to accommodate without squeaking such relative movement as may occur between the soles.

A further advantage achieved in the use of two separate cushion plies alternated with the several soles of a stitch-down shoe, consists in the fact that the bottom of the shoe is prevented from "cupping" around the edges, as it frequently does when the cushioning plies are omitted as in the conventional stitch-down construction.

Other objects of the invention include specifically a special heel construction for cushion stitch-down shoes, a special metatarsal arch support for stitch-down cushion shoes, and a special middle sole construction whereby the middle sole and upper and lower cushion plies are mechanically interconnected to fix their relative positions independently of adhesive such as the cement commonly used for this purpose.

In stitch-down shoes it is common to experience a buckling of the floating inner sole if the shoe is bent sharply. Where two sponge rubber plies are interleaved between the several soles and cemented thereto in accordance with the preferred

embodiment of the present invention, the yielding characteristics of the rubber enables the cement to hold and definitely to prevent any tendency of the inner sole to buckle regardless of the extent to which the shoe is flexed.

In the drawing:

Figure 1 shows a longitudinal section through the lower portion of a stitch-down shoe embodying the present invention.

Figure 2 is a plan view of the middle sole of a stitch-down shoe embodying the present invention.

Figure 3 is a plan view of the insole of such a shoe.

Figure 4 is a view of the shoe shown in Figure 1 as it appears in transverse cross section on the line 4—4 of Figure 1.

Like parts are identified by the same reference characters throughout the several views.

The lining 5 is lasted beneath the margin of the insole 6, and the margin of the upper 7 is turned outwardly in the conventional manner. Immediately below the insole 6, however, there is incorporated a yieldable ply 8 which may conveniently be made of sponge rubber or the like, and which is preferably cemented to the lower surface of the insole 6 and the lower surfaces of the margin of the lining 5, as clearly shown in Fig. 4.

The midsole 9 is applied below the cushion ply 8 and cemented thereto. The midsole preferably has apertures 10 of substantial size into which portions of the cushion ply 8 are receivable when such ply is subjected to pressure. This arrangement tends to anchor the cushion ply 8 and the midsole 9 respecting each other.

Intermediate its length the midsole 9 may optionally be provided with a larger aperture 11 containing a cushion plug which is somewhat thicker than the midsole and consequently is adapted to provide a certain degree of yieldable arch support.

In its heel portion, the midsole may have a further opening 15 and a plug 16 of yieldable material such as sponge rubber. This plug, however, is preferably no thicker than the rest of the midsole and is merely adapted to accumulate beneath the heelbone the yielding characteristics of the two separate plies of sponge rubber incorporated between the several soles. A similar

opening may be provided at 15' in the midsole beneath the ball of the foot, and a plug of sponge rubber 16' of the thickness of the midsole may be inserted at this point. The heel and the ball portions of the foot are the portions which normally carry the load, and by this arrangement a preferential degree of yieldability is provided beneath the load bearing portions of the foot through the simple expedient of inserting plugs of sponge rubber to make the midsole yieldable at these points.

To the under surface of the midsole 9 there is preferably cemented a second cushion ply 17 having approximately the same dimensions as the cushion ply 8. In other words, the cushion ply 17 is preferably materially narrower and shorter than the midsole 9, whereby to permit the outsole 18 to marginally engage the midsole 9 in the conventional manner. The respective margins of the outsole 18, midsole 9, and upper 7, together with the welt 19, are all secured together by stitching as usual. The outsole is preferably anchored by cement to the lower sponge rubber ply 17, whereby all three soles are cemented to the intervening sponge rubber plies for yieldable connection respecting each other, such connection being supplemented mechanically by the inter-engagement of the two cushion plies 8 and 17 in the apertures 10 of the midsole.

Beneath the heelbone and the ball of the foot (and also beneath the central portion of the longitudinal arch if the plug 12 is employed) the cushioning action of the upper ply 8 and the lower ply 17 is accumulated through the cushion plugs independently of any resistance which might otherwise be offered by the stiffness of the midsole. Since the midsole is very thin, however, and is anchored downwardly rather than upwardly at its margins, it will readily yield bodily in a downward direction, and consequently under the load of the foot the cumulative effect of the two cushion plies 8 and 17 is readily apparent.

As shown in Fig. 3, the floating insole 6 is preferably provided with small holes which may conveniently be disposed above the margins of plugs 16, 12 and 16'. These holes perform a dual function. Insofar as the material of sponge rubber ply 8 expands into these holes it tends to supplement the action of the adhesive in anchoring the floating insole against displacement respecting the midsole. Additionally, the row of holes so weakens the portion of the insole above the rubber plugs as to permit such insole portions increased flexibility whereby to enable them to respond to the increased resilience afforded by the addition of the plugs at these special points.

Obviously, the advantages of the present invention may to some extent be obtained despite the omission of either one of the sponge rubber plies 8 or 17. Only by using both plies in the relation specified, however, can the several soles be yieldably anchored together to obtain all the various mechanical advantages of the present invention.

I claim:

1. A stitch-down shoe comprising three soles having load bearing portions and thin plies of cushion material interposed between the said portions of the several soles, whereby such portions are yieldably supported out of contact with each other.

2. A stitch-down shoe comprising the combination with an upper turned marginally outwardly and a lining turned marginally inwardly, of a floating insole beneath which said lining extends, a cushion ply beneath said insole and within said

upper, a midsole beneath said cushion ply and extending therebeyond to underlie the margin of said upper, a second cushion ply beneath the midsole and substantially smaller in area than said midsole, and an outsole beneath said second cushion ply and with which said midsole and upper are marginally connected outside of said second cushion ply.

3. A stitch-down shoe comprising the combination with three spaced soles, cushion plies interposed between the several soles, the intermediate sole being apertured beneath the heelbone, and a cushion plug interposed in said aperture and arranged to directly supplement the cushioning effect of said cushion plies and plug beneath the heelbone.

4. A stitch-down shoe comprising the combination with an insole and an outsole, of two cushion plies therebetween, and a midsole interposed between said cushion plies and provided with apertures yieldably engaged by the material of such plies, whereby mechanically to tend to interlock the midsole and the respective cushion plies against relative displacement.

5. In a cushion shoe, the combination with an insole and an outsole, of a midsole centrally apertured, and a cushion plug fixed in the aperture of the midsole and arranged to provide a yieldable arch support.

6. In a stitch-down cushion shoe, the combination with an upper and a lining, of an insole to which the lining is secured, an outsole to which the upper is secured, a midsole between the inner sole and the outsole substantially co-extensive with the outsole and having its margins confined between the outsole and the upper and provided with an opening at the heel, a welt applied over the margins of the upper, stitching connecting the welt, and the marginal portions of the outsole, midsole and upper independently of the inner sole, and a cushion plug fixed in the opening of the midsole and positioned by the stitching which anchors the margin of the midsole to provide special cushioning beneath the heel bone.

7. In a cushion stitch-down shoe, the combination with an upper, an outer sole and an inner sole having load sustaining portions and means connecting said upper marginally to said outsole about said portions, of a cushion ply in contact with one of said soles and substantially co-extensive with the load sustaining portion thereof, a midsole interposed between said ply and the other of said soles and held marginally by said connecting means and provided with at least one aperture, and a cushion plug inserted in said aperture.

8. In a cushion stitch-down shoe, the combination with an outer sole and an inner sole, of a cushion ply in contact with one of said soles, a midsole interposed between said ply and the other of said soles and having a plurality of apertures beneath the load bearing portions of the foot, and cushion plugs in said apertures supplementing the resilience of said cushion ply.

9. In a stitch-down shoe, the combination with an outer sole, a midsole, and a floating insole, of cushion plies between said outsole and midsole and between said midsole and insole, each of said plies being cemented in face contact with the soles at either side thereof, whereby yieldably to connect said several soles throughout their area against displacement and buckling.

10. In a stitch-down cushion shoe, the com-

5 bination with an upper and a lining, of an in-
sole to which said lining is secured, an outsole to
which said upper is secured, a midsole between
the inner sole and the outer sole and having its
10 margins confined between the outsole and the
upper, means connecting the outsole, the midsole
and the upper, and at least one cushion ply be-
tween the midsole and the outer sole and dis-
posed wholly within the line of connection be-
tween said upper and the outer sole.

11. In a cushioned shoe, the combination with
a pair of mutually spaced soles, one of which

comprises a floating insole, and the outer of
which has apertures, of an elastically yieldable
cushion interposed between said soles and ce-
mented to each thereof, said cushion being elas-
tically expansible under pressure into the aper-
tures of the apertured sole, whereby mechanical-
ly to resist relative displacement between said
cushion and apertured sole, such mechanical
resistance being supplementary to the resistance
of the cement.

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