ARCH SUPPORT SHOE
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Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

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ARCH SUPPORT SHOE

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1 Claim. (Cl. 36—8.5)

My invention relates to an arch support shoe in which the upper extends downwardly around the arch support to the bottom thereof so that the arch support is within the upper, and has reference more particularly to a shoe wherein the arch support is provided with a top covering layer which is permanently secured to the shoe bottom in such manner that the covering layer, and the arch support if already attached thereto, may be moved out of the way so as to permit the upper to be stitched or otherwise fastened to the shoe bottom along and close to the margin of the area thereof on which the arch support is located in the finished shoe.

My invention is particularly advantageous when an arch support of cushiony material, such for example as sponge or foam rubber, is employed and especially when such arch support is incorporated in a slipplasted or California type shoe which has a covering or sealing strip extending around the sole or sole assembly.

Generally, in such shoes, the cushion arch support is located below the upper underneath the sole layer to which the upper is secured and within the confines of the covering or sealing strip which extends around the sole, although such location of the cushion arch support is disadvantageous.

One disadvantage of such location is that the cushion arch support does not have sufficiently free breathability and it has a tendency to trap and set any perspiration therein. Another disadvantage is that because of the location of the arch support below the sole layer to which the upper is attached, the sole edge covering or sealing strip, which customarily extends up to the shoe upper, is of increased width where the arch support is located and this gives the shoe a somewhat clumsy and unattractive appearance.

Also, the incorporation of the arch support in the structure below the sole layer to which the upper is secured tends to subject the support to some compression, and consequently it does not have as soft cushiony feel as desired nor is it capable of conforming as perfectly to the bottom of the foot as it would be if unconfined.

The principal objects of my invention are to provide a shoe having a cushion arch support incorporated therein in an improved manner; to incorporate the arch support between top and bottom layers of material, both of which are constructed as a permanent part of the shoe; to permit the shoe upper to be stitched or otherwise secured to the bottom layer along the margin of the area thereof on which the arch support is located in the finished shoe; to utilize a top layer which is continued forwardly beyond the arch support and covers the front part of the sole, and thereby provides an unbroken surface for foot support; to avoid any structural confinement of the arch support which might impair the soft cushiony feel of the arch support; to permit the cushion arch support to conform freely to the bottom of the foot; to provide ample breathability to avoid any accumulation of moisture or perspiration in the arch support; to arrange the arch support so that the expansion and contraction thereof causes air circulation in the foot compartment of the shoe; to permit an edge covering strip or foxing of uniform width to be used around the sole without any widening thereof or other special construction to compensate for the higher elevation of the foot supporting surface where the arch support is located; and in general to incorporate a cushion arch support in a shoe by a method and in a manner which improves the effectiveness and comfort of the arch support, avoids any external arrangement of shoe parts which might impair the appearance of the shoe and otherwise is an improvement over previous cushion arch support shoe structures, these and other objects being accomplished as pointed out more fully hereinafter and as shown in the accompanying drawings,

in which:

Fig. 1 is a side view of a shoe constructed in accordance with my invention;

Fig. 2 is a vertical sectional view taken lengthwise through the sole of the shoe of Fig. 1;

Fig. 3 is a cross sectional view of the shoe sole taken on the line 3—3 of Fig. 2 and showing the parts partly unassembled at one side;

Fig. 4 is a perspective view of the arch support and the shoe bottom parts to which it is directly secured, these parts being partially pulled away from the arch support; and

Fig. 5 is an enlarged fragmentary sectional view of the connection of the lower margin of the shoe upper to the shoe sole.

Referring to the drawing, in which I have, for purposes of illustration, shown my invention in connection with a shoe of tennis shoe type, the reference numeral 10 indicates the shoe upper which is of conventional construction and has a platform sole attached thereto and composed of a thick platform layer 11 of felt, cork or other suitable material, with a rubber outsole 12 secured to the bottom thereof.

The lower margin of the upper 10 projects downwardly below the top face of the platform
layer 11 into a marginal recess 13 around the top portion of the platform layer 11 and is there secured by a line of stitches 14 between and to the downturned edge 15 of a fabric sole covering, and the inwardly downturned upper edge portion 16 of a sole binding strip 17. Said fabric sole covering, as hereinbefore explained is composed of two pieces 24 and 25 and is secured throughout its area to the top of the platform layer 11.

Another line of stitches 18, below the stitches 14, also connects the downturned edge 15 of the fabric sole covering 24, 25 to the lower margin of the upper 10, this line of stitches 18 being useful particularly in assembling the shoe parts as explained hereinafter.

The sole binding strip 17, which is turned down above the line of stitches 14, extends downwardly around and is secured to the marginal edge of the platform layer 11 and has a wide lower edge portion 19 which is turned in between and secured to the platform layer 11 and outsode 12, the space which is surrounded by this turned edge 19 being filled with a layer 21 of rug stock, consisting of rubber and ground up fabric, calendered to a suitable thickness to provide a uniform spacing of the layer 11 and outsode 12 throughout the area thereof.

Thus the binding strip 17 not only serves to secure the platform sole 11, 12 to the shoe upper 10 but also provides a covering for the edge face of the platform layer 11 and for the stitches by which the sole is secured to the upper.

In the illustrated shoe a boxing 22 is applied around the shoe and extends from the bottom of the outsode to the top of the covering 17, but this boxing 22 is not essential and in platform sole shoes of many types is generally omitted.

The fabric sole covering 24, 25 has a cushion arch support 23, of sponge or foam rubber or other suitable cushioning material, adhesively secured to the top of the heel and shank portions thereof and this arch support terminates at the front extremity of the shank portion in a tapered edge which is preferably convexly curved and extends across the top of the sole covering.

The part 24 of the fabric sole covering 24, 25 covers the heel and shank portion of the platform layer 11 and extends just beyond the forward edge of the arch support 23, preferably in a convex curve corresponding to that of the forward edge of the arch support, and is permanently secured by several lines of stitches 26 along its forward edge to the part 25 which extends forwardly therefrom and covers the ball and toe portion of the platform layer 11.

This ball and toe portion 25 of the fabric sole covering does not terminate at the stitchings 26 but has a part 27, integral therewith, which extends rearwardly over the arch support 23 and is adhesively secured to the top face thereof, said part 27 being of suitable shape to completely cover and conform to the top face of the arch support.

Obviously the part 24 underneath the arch support could be made as an integral part of the portion 25 and the top part 27 could be a separate piece stitched to the integral parts 24, 25 at 26, but it is preferred to make the parts 25 and 27 integral as above described and as shown in the drawings inasmuch as these two parts 25 and 27 serve as a sock liner upon which the foot rests and therefore it is preferable that this sock liner have a smooth continuous top surface without any seam edges. When so made the seammed edge of the lower part 24 is on the underside and embedded in the top of the platform layer 11 so that the top surface of the continuous sock liner 25, 27 is perfectly smooth at the seam.

From the foregoing it will be understood that the top covering 27 of the arch support is entirely free of any direct connection with the shoe upper but than the integral portion 25 thereof beyond the seam 28 and also the part 24 which is underneath the arch support have their marginal edges turned down as at 15 and secured directly to the bottom margin of the shoe upper by the stitches 14.

The bottom part 24 is sufficiently larger than the bottom face of the arch support 23 so as to have a marginal edge along the sides and rear thereof beyond the arch support, which is turned down as at 15 in the shoe and stitched to the lower margin of the upper 10 and the forward portion 25 of the sock liner 25, 27 is correspondingly enlarged to provide a corresponding downturned edge 15 along the sides and across the front end thereof, said sock liner 25, 27 being notched at each side as at 28 so that the part 27 is narrowed to the width of the arch support and fits freely within the shoe upper.

Thus the cushion arch support 23 is securely held in place within the shoe upper as the bottom covering part 24 to which it is adhesively secured is directly secured by the stitches 14 and 18 to the shoe upper and also secured to the top of the platform layer 11 and moreover the top covering 27 to which the arch support is also adhesively secured, although not directly secured to the upper or to the shoe sole along its lateral edges or at the rear is nevertheless a permanently attached part of the shoe as it is an integral part of the portion 25 which is directly secured to the upper 10 and to the platform layer 11.

In shoes of this character as previously constructed it has been customary to stitch the upper to the top covering of the arch support, such as the part 27 hereof, instead of to a layer 24 extending beyond the bottom thereof, such as the layer 24 hereof, and accordingly while the upper, in such previous structures, was secured along its lower margin to the sole covering at the ball and toe portion of the shoe, as it is to the portion 25 herein, the stitching around the arch support was at a distance from the lower margin of the upper which varied according to the elevation of the top surface of the arch support at the particular place of the stitches.

In such previous structures the platform sole edge covering strip corresponding to the strip 17 hereof was attached to the upper at the same place where the upper was stitched to the top covering of the arch support so as to extend over and conceal and protect the stitches and accordingly the platform sole edge covering strip of previous structures was not of uniform width around the shoe but of varying increased width around the arch support depending upon the height of the latter.

This not only was undesirable from the standpoint of appearance and inconvenience in preparing and applying a strip of such width, but the arch support being surrounded by the edge covering strip of the platform sole and completely enclosed was so restricted in breathability that moisture and perspiration tended to accumulate under this sock liner and projects upwardly in the bottom of the foot con-
taining compartment of the shoe and is free of any connection with the upper therearound or any sealing enclosure thereby which would interfere with breathability and accordingly is free of any tendency to accumulate moisture or perspiration.

Moreover, because of its disposition within the foot compartment, instead of being enclosed within the sole thereof, the compression and expansion thereof which occurs in use causes air circulation in the bottom of the foot compartment which is quite beneficial in contributing a cooling effect to the interior of the foot compartment, especially at the bottom where such cooling effect is particularly desirable.

Furthermore, since the arch support in the present case is attached only at the bottom and thereabove is free of any compressive strains, it has a softer and more comfortable feel than the cushion arch supports of previous structures and is capable of conforming more closely to the bottom of the foot.

In the manufacture of the above described shoe, the upper 10 is assembled ready for lasting and the two piece fabric sole covering 24, 26, 28 is prepared with the bottom part 24 stitched to the sock liner part 25, 27 along the lines 36, 38, with the bottom heel and insole part 23 sufficiently larger than the bottom of the arch support to have a stitching margin of, for example, one-eighth inch thereacross, for later turning 15 in the shoe assembly. The part 25, 27 is made of such size that the rear portion thereof corresponds and conforms to the top surface of the arch support but is widened at 28 to provide around the forward portion a like one-eighth inch margin for subsequent turning down 15 and stitching to the upper.

Before assembly of the fabric assembly, a coating of cement is applied to the underside of the portion 27 as indicated at 29 and to the top side of the part 24 as indicated at 30 and, if desired, the arch support may be secured by cementing the side of the part 27 (not to the top of the part 24) before assembly of the fabric assembly 24, 25, 27 in the shoe.

Then the fabric assembly 24, 25, 27 as thus prepared is placed in proper position within the bottom 16 and the margin of the parts 24 and 25 are stitched as at 18 (see Fig. 5) to the lower margin of the upper 10 about one-sixteenth of an inch from the edge of each, the part 27, and the arch support 23 if already attached thereto, being loose (except at the forward end) and sufficiently slidable out of the way in the stitching operation so that the stitching operation may be readily performed on the notches 28 permitting the stitching at those places to continue from the part 24 to the part 25, or vice versa, and leave the part 27 entirely free down to the notches 28.

Thereafter, the sole binding strip 17 is applied in an upturned position around the bottom of the upper 10 and is stitched, as at 18 to the bottom margin of the upper 10 and also to the margin of the parts 24 and 25 about one-eighth of an inch from the edges of all the stitched parts, the part 27, and the arch support if already attached to the part 27, being still free of attachment to the part 24 so that the stitching may be readily performed and applied to the part 24 along a line closely defining the area to which the arch support 23 is to be subsequently secured.

After the stitching is thus performed, the underside of the arch support, if already attached to the part 27, is cemented to the top surface of the part 24, within the down-turned stitched margin 15 thereof or if the arch support 23 was not previously applied to the part 27, it is then inserted in proper position between the parts 24 and 27 and, and the top and bottom surfaces thereof having been previously coated with cement, it is cemented to the part 24 and the part 27 is cemented to the top thereof.

After the above operations, the assembly is placed on a last, and cement is applied to the bottom of the parts 24 and 25. The platform layer 11, prepared in suitable size to fit the bottom of the shoe, is cemented on the top side and secured in place on the cemented bottom of the parts 24 and 25, after which the bottom side of said platform layer 11 is coated with cement.

Then the sole binding strip 17 is turned down around the edge of the assembly and layer 11 and the bottom edge thereof is turned in and cemented to the bottom face of the platform layer 11 as indicated at 19, after which the filler 21 is placed on the exposed portion of the platform layer 11 bottom within the inturmed edge 18 to provide a level surface continuous thereof.

Cement is then applied to the exposed surface of the inturmed edges 19, or previously applied cement is freshened, and the outsole 12 is then cemented to the entire bottom of the thus prepared shoe, after which the foxing strip 22 is cemented around the shoe to the edges of the outsole 12 and the exposed outer face of the portion 17 of the sole binding strip. This foxing strip extends to the top bend of the strip 17 as shown in Figs. 2 and 3 and by virtue of the present invention, is of uniform width throughout.

While I have shown and described my invention in connection with a tennis type shoe, it is to be understood that such shoe is merely illustrative and that the invention is applicable to other types of shoes, especially those of platform sole types. Moreover, other changes and modifications may be made without departing from the spirit of the invention, the scope of which is to be determined by the following claim.

What is claimed is:

In a platform sole shoe, the combination of a sole assembly comprising a rubber tread layer of substantially uniform thickness having a relatively thick layer of substantially uniform thickness and of easily compressible cushiony material thereon and forming a sole assembly of substantially uniform thickness throughout, said assembly having a facing strip therearound of substantially uniform width covering the surrounding edge face of the assembly and with an attached strip interposed between said facing strip and the surrounding face of the layer of cushiony material, a cushion arch support overlying the heel and shank portions of the sole assembly and having the front end thereof tapered to and terminating in an edge which extends transversely across the top of the sole assembly between the shank and toe portions thereof, a shoe upper within which the arch support is located and which extends downwardly beyond the bottom of the arch support and has the lower margin thereof extending between said facing strip and the layer of cushiony material and secured therewith to said attaching strip, and an insole assembly having an upper layer extending integrally the full length of the shoe and a lower layer extending only from the ball region of the shoe to the rear thereof between which said layers the arch support is interposed and which said layers
are stitched together transversely directly in front of and along said front edge of the arch support, said upper layer only being continued forwardly beyond the juncture of the two layers to overlie the toe portion of the sole assembly, 5 said upper layer being secured to and covering the top face of the arch support and the other of said layers being interposed between the arch support and the sole assembly and secured to the bottom face of the arch support, and the latter layer and the aforesaid forwardly continued portion only of the other layer both having down-turned margins which are interposed between the facing strip and the layer of cushiony material and are secured therebetween to the lower margin of the upper and to said attaching strip entirely around the shoe, the upper layer of the insole assembly being marginally reduced rearwardly of said transverse stitching and being free from the upper.

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