

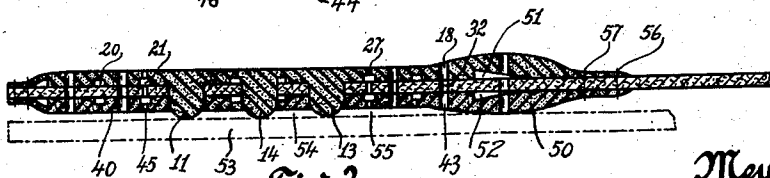
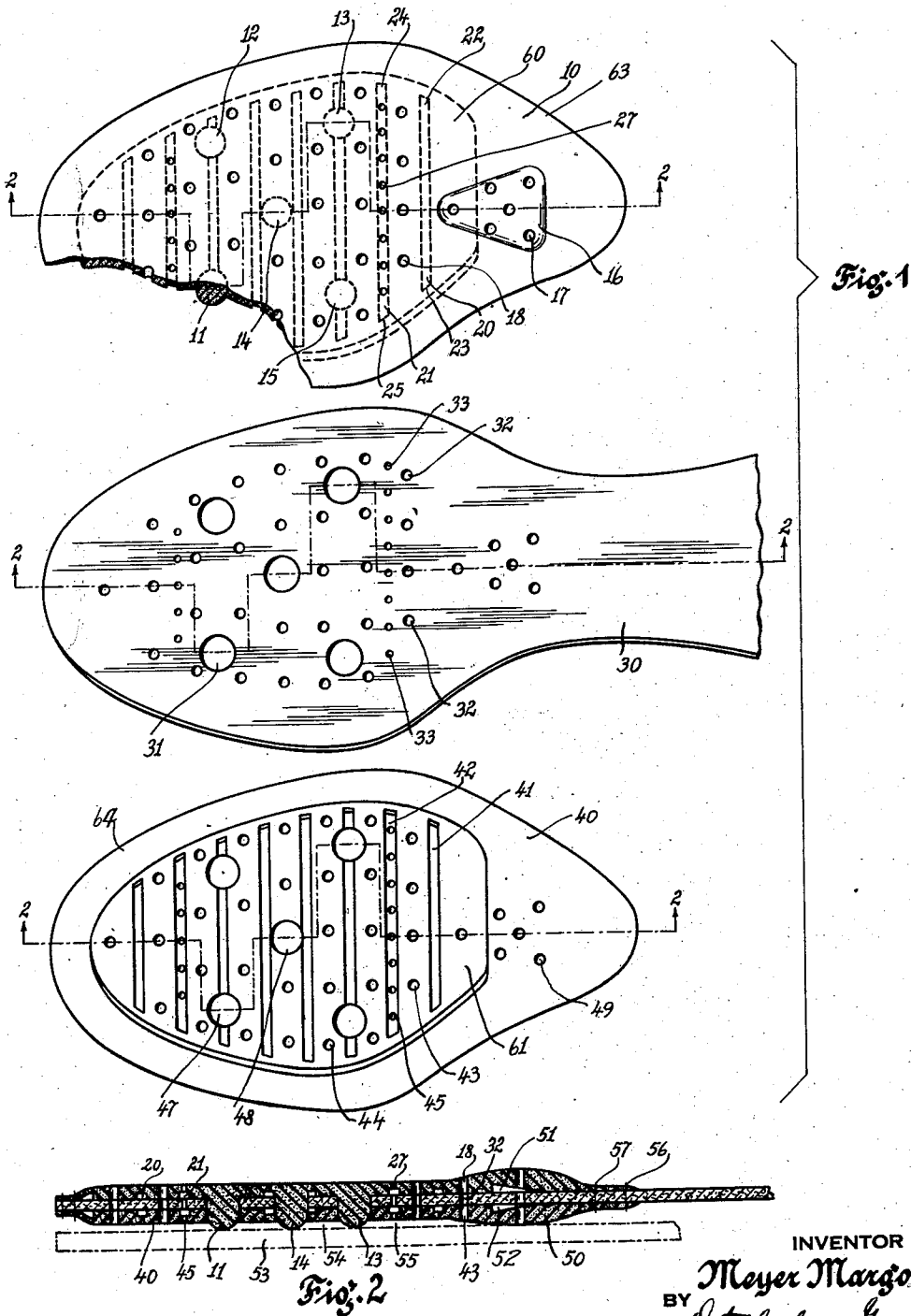
Nov. 24, 1942.

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2,302,706

VENTILATED INSOLE COMBINATION

Filed Jan. 10, 1941



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UNITED STATES PATENT OFFICE

2,302,706

VENTILATED INSOLE COMBINATION

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Application January 10, 1941, Serial No. 373,882

11 Claims. (Cl. 36-3)

My invention relates to a novel ventilating insole and resilient filler combination and more particularly my invention relates to a combination of a perforated insole with an overlying and underlying resilient layer, all of which are combined by downwardly depending lugs which are integrally formed with the overlying layer and which extend through openings in the insole and in the underlying layer, which downwardly depending lugs may protrude beyond the underlying layer so as to rest upon the outsole.

In shoe making, it is extremely desirable that the insole of the shoe be extremely flexible and it is further desirable that ventilation and breathing be effected within the shoe construction so that foot comfort is enhanced.

I have now provided a novel construction by means of which the desirable insole flexibility and the desirable forced breathing effects may be obtained by a combination of resilient layers and insole.

It is the object of my invention to provide a novel combination comprising an insole which has been rendered more flexible by openings died therethrough and a overlying layer formed, for example, of resilient rubber material, which overlying layer carries downwardly depending lugs, which extend through the openings in the insole and through corresponding openings in an underlying resilient layer formed, for example, of rubber to form a laminated frictionally adhering construction characterized by flexibility and forced breathing properties.

It is a further object of my invention to provide a novel combination of insole, overlying layer and underlying layer, with downwardly depending lugs from the overlying layer which extend through and beyond the underlying resilient layer so that such lugs rest upon the outsole of the shoe to increase the resilience of the construction and to obtain enhanced forced breathing effects.

It is a further object of my invention to provide integrally formed metatarsal support resiliently maintained in the above construction.

These and further objects of my invention will be apparent from a consideration of the drawing taken in connection with the specific description which here follows.

Figure 1 is a plan view of the three component elements of my invention.

Figure 2 is a cross section taken along the line 2-2 of Figure 1, showing the assembly of these

elements in the flexible and breathing insole combination of my invention.

Referring now more specifically to the drawing, in Figure 1 I show a layer 10 which is molded from rubber or cellular rubber such as sponge or closed cell rubber. Downwardly depending from the underside of the layer 10 are lugs 11 as shown in the cut away portion of the layer 10, and shown in dotted lines at 12, 13, 14 and 15. These downwardly depending lugs may be variously spaced and located in accordance with the frictional adhesion of the parts or the breathing effects desired. Mounted or integrally formed on the layer 10 is a metatarsal support 16 through which extend perforations 17. Perforations 18 in the main body of the layer 10 afford transmission of the air through the composite structure and facilitate the transmission of the forced breathing effects of the construction to the interior of the shoe. On the bottom of the layer 10, I provide grooves 20, and 21 which may be open ended or may have terminating walls 22, 23, 25 and 24, as shown, which terminating walls enhance the breathing effects. Located in the groove 21 are perforations 27 which transmit air directly from the groove 21 to the interior of the shoe.

A second element of my combination is the insole 30 which has openings 31 for the reception of the downwardly depending lugs 11, and I may further provide various other perforations 32 and 33 which facilitate the transmission of air from the construction to the shoe interior. These perforations further increase the flexibility of the insole which is a desirable feature.

A third component element of my construction comprises an underlying layer 40 of resilient material which carries on its upper surface grooves 41, 42, etc., and through which extend perforations 43, 44, for the transmission of air. The action of the grooves 41 and 42 is similar to that of the grooves 20 and 21 above, namely the grooves increase the flexibility of the layers and also cause a forced breathing upon flexing of the construction in normal shoe use. Groove 42 may contain perforations 45 which directly transmit air from the grooves to the undersurface of the layer to provide circulation thereof.

Openings 47, 48, etc., are adapted to receive the downwardly depending lugs 11 so that the three component elements are adhered together frictionally and as will be shown hereinafter these downwardly depending lugs may extend through and beyond the openings 47 and 48 to rest on the outsole of the shoe. Perforations 49 cause the

circulation of the air in the region of the metatarsal support.

In Figure 2 I show the three elements 10, 30 and 40 combined in their final position. It will be noted that the layer 40 additionally may carry a metatarsal support 50 and this metatarsal support may be given increased resilience and additional breathing functions by the air spaces 51 and 52. It will be noted from this drawing that the lugs 11 extend through and beyond the lower layer 40 and rest upon the outsole 53 shown in dotted line.

Air spaces 54, 55 are thereby formed by the downwardly depending lugs. These air spaces upon compression force air up through perforations 45 and 27 to the shoe interior.

In the normal usage of the shoe, the pressure of the foot on this combination of insole and overlying and underlying layers compresses the grooves and air spaces developed therein, and when the combination is flexed in the act of walking the grooves and the air spaces are further compressed and decompressed to enhance the circulation of air therethrough. To additionally secure the parts, I may provide stitching 56 57 which extends about and adjacent the periphery of the lamination.

By means of this construction free flowing passage of the air through the perforations 43, 32 and 18 or the perforations located in the grooves 42, 21 and the corresponding perforations 33 in the insole is afforded. This air is developed through the compression and flexing of the shoe.

This application is in part a continuation of my co-pending application Serial No. 306,778, filed Nov. 30, 1939, for Novel insole and outsole combination, and the modifications shown therein of the resilient layer may be employed in the present construction.

The central portion, generally denoted as 60 on the layer 10 and 61 on the layer 40 is preferably thicker than the peripheral lap portion 63 and 64 of the layers 10 and 40 respectively, and the lap portion may comprise in lieu of the abrupt laps here shown a gradually diminishing lap which diminishes from the thickness of the central portion 60 and 61 to a feather edge.

By my construction which includes an overlying and an underlying layer of resilient material with the insole positioned therebetween I obtain not only increased resilience and breathing properties, but I also protect the life and flexibility of the insole from the deterioration which normally results from the penetration of foot perspiration or dampness thereto. As is known in this art, an insole that has over a period of time been subjected to dampness and drying out loses its resilience and becomes hard and dry. In this condition its flexibility is lost to a substantial extent and, in fact, a certain curling of the insole may occur. By the protective overlying and underlying resilient layer of rubber-like material which I employ and by the forced breathing which I effect in the construction, I eliminate such difficulties and maintain the insole in its original flexible and resilient state over an extended period of time.

It is to be understood that the constructions shown and described above are given by way of example and I intend to be limited only by the claims hereto appended.

I claim:

1. In combination, an insole, an overlying resilient layer of rubber like material, and an underlying resilient layer of rubber like material,

lugs downwardly depending from said overlying resilient layer, openings through said insole and said underlying resilient layer, said lugs extending into said openings, perforations extending through said overlying resilient layer and said underlying resilient layer for transmission of air therethrough.

2. In combination, an insole, an overlying resilient layer of rubber like material, and an underlying resilient layer of rubber like material, lugs downwardly depending from said overlying resilient layer, openings through said insole and said underlying resilient layer, said lugs extending into said openings, perforations extending through said insole, said overlying resilient layer and said underlying resilient layer for transmission of air therethrough.

3. In combination, an insole, an overlying resilient layer of rubber like material, and an underlying resilient layer of rubber like material, lugs downwardly depending from said overlying resilient layer, openings through said insole and said underlying resilient layer, said lugs extending into said openings, grooves on the underside of said overlying resilient layer.

4. In combination, an insole, an overlying resilient layer of rubber like material, and an underlying resilient layer of rubber like material; lugs downwardly depending from said overlying resilient layer; openings through said insole and said underlying resilient layer, said lugs extending into said openings; and grooves on the upper side of said underlying resilient layer.

5. In combination, an insole, an overlying resilient layer of rubber like material, and an underlying resilient layer of rubber like material; lugs downwardly depending from said overlying resilient layer; openings through said insole and said underlying resilient layer, said lugs extending into said openings; and grooves on the underside of said overlying resilient layer and grooves on the upper side of said underlying resilient layer.

6. In combination, an insole, an overlying resilient layer of rubber like material, and an underlying resilient layer of rubber like material; lugs downwardly depending from said overlying resilient layer; openings through said insole and said underlying resilient layer, said lugs extending into said openings; grooves on the underside of said overlying resilient layer, grooves on the upper side of said underlying resilient layer; and perforations extending through said overlying resilient layer and said underlying resilient layer for transmission of air therethrough.

7. In combination, an insole, an overlying resilient layer of rubber like material, and an underlying resilient layer of rubber like material, lugs downwardly depending from said overlying resilient layer, openings through said insole and said underlying resilient layer, said lugs extending into said openings, grooves on the underside of said overlying resilient layer, and perforations in said grooves.

8. In combination, an insole, an overlying resilient layer of rubber like material, and an underlying resilient layer of rubber like material; lugs downwardly depending from said overlying resilient layer; openings through said insole and said underlying resilient layer, said lugs extending into said openings; grooves on the upper side of said underlying resilient layer; and perforations in said grooves.

9. In combination, an insole, an overlying resilient layer, an underlying resilient layer, and

an outsole; lugs downwardly depending from said overlying resilient layer; openings through said insole and said underlying resilient layer, said lugs extending through said openings, the ends of said lugs resting on said outsole.

10. In combination, an insole, an overlying resilient layer, an underlying resilient layer, and an outsole; lugs downwardly depending from said overlying resilient layer; openings through said insole and said underlying resilient layer, said lugs extending through said openings, the ends of said lugs resting on said outsole, and

spacing said underlying resilient layer from said outsole.

11. In combination, an insole, an overlying resilient layer, and an underlying resilient layer, means for securing said elements together, a metatarsal support molded integrally with said overlying resilient layer and a metatarsal support molded integrally with said underlying resilient layer, said first mentioned metatarsal support being superimposed over said second mentioned metatarsal support.

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