

Dec. 22, 1959

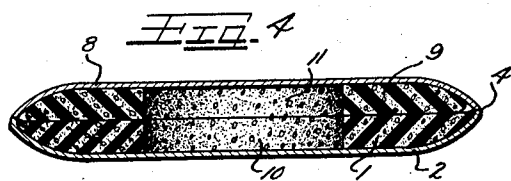
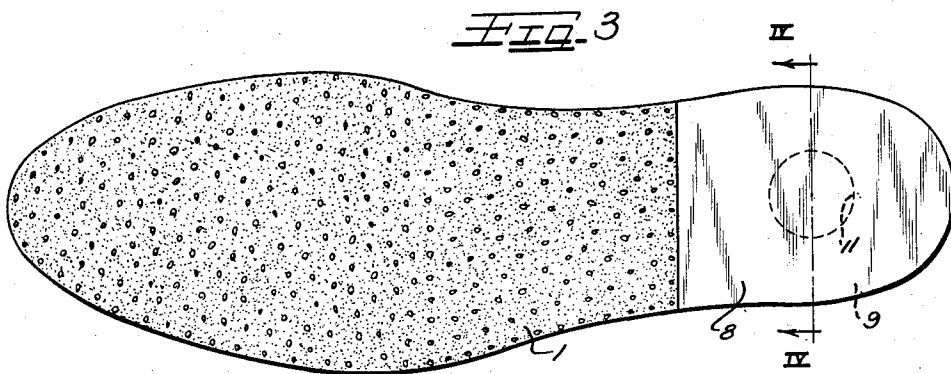
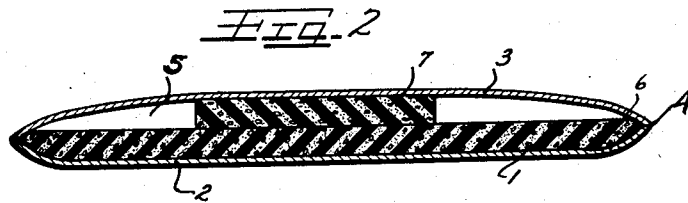
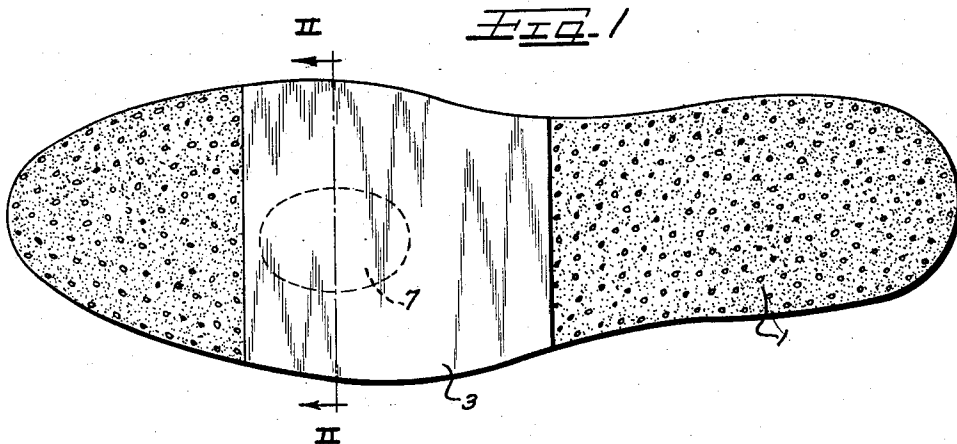
W. M. SCHOLL

2,917,844

LAMINATED FOOT CUSHIONING DEVICE WITH POCKETED LIFT

Filed Oct. 16, 1956

2 Sheets-Sheet 1



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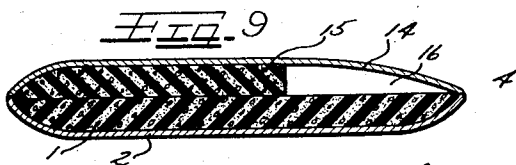
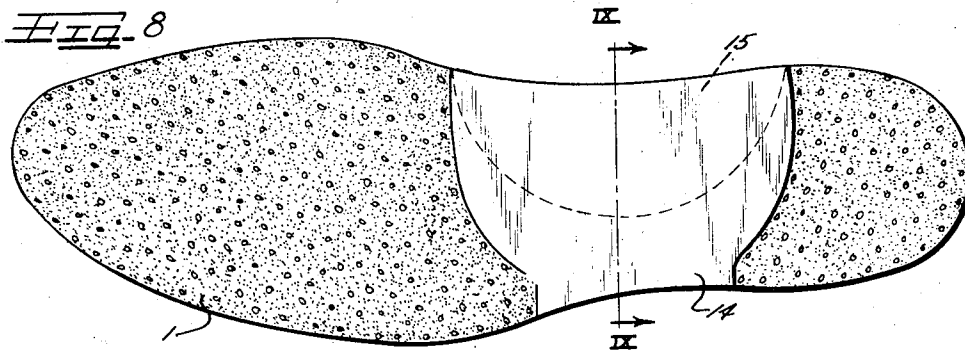
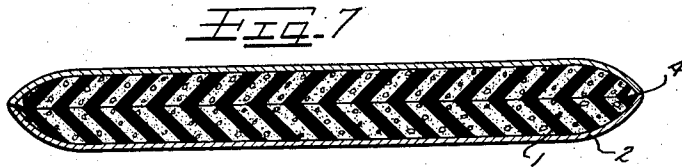
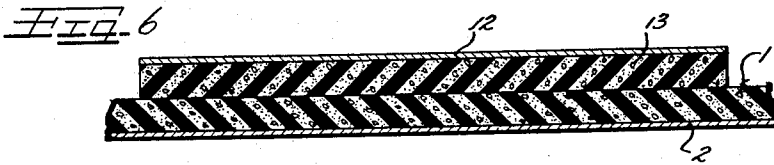
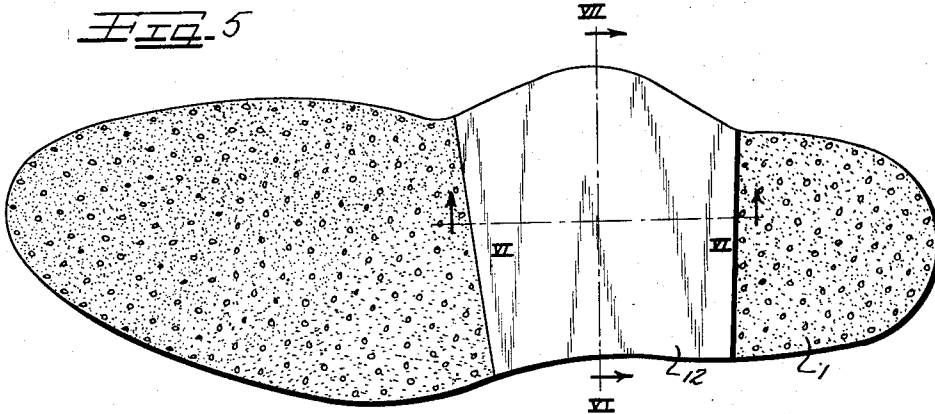
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2 Sheets-Sheet 2



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2,917,844

**LAMINATED FOOT CUSHIONING DEVICE WITH POCKETED LIFT**

William M. Scholl, Chicago, Ill.

Application October 16, 1956, Serial No. 616,325

1 Claim. (Cl. 36-71)

This invention relates to improvements in a laminated foot cushioning device with pocketed lift, and more particularly to a foot cushioning and supporting device of a corrective character which may be so constructed as to accommodate lifts in various predetermined locations depending upon the function of the device in regard to particular ailments and afflictions of the feet, and wherein the lift is carried within a pocket formed in the device, the invention being highly desirable for disposition in an article of footwear beneath the plantar surface of the human foot, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

In the past, many and various types of foot cushioning and corrective appliances for disposition in an article of footwear beneath the plantar surface of the human foot have been developed, but in such devices where added lifts to effect localized additional corrective pressure were utilized, the lifts were frequently not pocketed but secured to some other part of the structure in such a manner as to provide a hard region around the lift at the point of securement or the lift was cemented in position giving a region of less cushioning effect in the neighborhood of the lift. Also, these formerly known devices did not provide for relative movement between adjacent overlying layers of the device and the lift, so that frequently objectionable and uncomfortable wrinkling of the lift occurred. Further, with devices of this character heretofore known it was not possible to remove a lift and substitute a lift of lesser effect so as gradually to work toward the elimination of the lift as the foot responds to the corrective influence of the device, or on the contrary interchange a lift for a thicker one in the event the device did not fit satisfactory in the first instance or some untoward circumstances occurred. In addition, it may be mentioned that with devices of this character heretofore known, either where the lift was secured in position, or where it was free to be removed and replaced, in most cases the device was so constructed that extra wear occurred on adjacent parts of the region of the lift itself, or upon the lift if it contacted the article of footwear, whereby the device did not maintain substantially its original effectiveness throughout its duration of use. In each instance of which I am aware, formerly known devices of this character where lifts were added, and particularly where those lifts were pocketed, required a number of operations in order to assemble the completed device, thereby adding objectionably and sometimes prohibitively to the cost of manufacture.

With the foregoing in mind, it is an important object of the instant invention to provide a laminated foot cushioning device with a pocketed lift, and wherein all the laminations including the member defining the pocket may be secured together in a single operation.

Another object of the invention is the provision of a device as just abovementioned, wherein the lift is also secured to the laminations in the same operation that joins the laminations to each other.

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A further feature of the instant invention is the provision of a foot cushioning device with a pocketed lift, and with the lift freely disposed in the pocket and readily removable and replaceable, the construction being such that the lift remains in the intended position against maladjustment, and abrupt edges at the boundary of the lift are eliminated by the construction of the device.

It is also a feature of this invention to provide a foot cushioning device incorporating a pocketed lift at a predetermined location in accordance with the desired function of the device, and the device being so constructed that it maintains its original effectiveness substantially throughout its entire life, no added wear being discernible in the region of the lift.

Still another object of the instant invention resides in the provision of a foot cushioning device embodying a pocketed lift, with a lift either removable from the pocket or secured therein, which device permits relative movement between adjacent parts and the lift, so that bulging and wrinkling do not occur while the device is in use.

Still a further object of the instant invention resides in the provision of a foot cushioning device embodying a number of laminations one of which is designed to form a pocket with the next adjacent lamination; the laminations including that forming the pocket being simply heat sealed together, and the lift being freely disposed in the pocket or connected by the same heat sealed seam, if so desired.

Another and important object of the instant invention is the provision of a foot cushioning device for disposition beneath the plantar surface of the foot, and wherein a pocket for a lift may be provided at any desired location, and wherein the mere cutting and positioning of an added lamination to form the pocket defines the only difference in construction between the various forms of the device, whereby all forms of the device are extremely economical to manufacture.

While some of the more salient features, characteristics and advantages of the instant invention have been above pointed out, others will become apparent from the following disclosures, taken in conjunction with the accompanying drawings, in which

Figure 1 is a bottom plan view of a laminated foot cushioning device embodying principles of the instant invention;

Figure 2 is a transverse vertical sectional view through the structure of Figure 1 taken substantially as indicated by the line II—II of Figure 1 looking in the direction of the arrows, the showing in Figure 2 being greatly enlarged;

Figure 3 is a bottom plan view of a foot cushioning device embodying principles of this invention but of slightly different construction, illustrating a different location for the lift;

Figure 4 is an enlarged vertical cross-sectional view taken substantially as indicated by the line IV—IV of Figure 3;

Figure 5 is a bottom plan view of a foot cushioning and corrective device of still different construction;

Figure 6 is a greatly enlarged fragmentary longitudinal vertical sectional view taken substantially as indicated by the line VI—VI of Figure 5;

Figure 7 is also an enlarged vertical sectional view taken substantially as indicated by the line VII—VII of Figure 5;

Figure 8 is a bottom plan view of a device illustrating a still different construction of the instant invention; and

Figure 9 is an enlarged transverse vertical sectional view taken substantially as indicated by the line IX—IX of Figure 8.

As shown on the drawings:

While the instant invention may be made in substan-

tially any shape and thickness depending upon the particular type of foot affliction it is to benefit, for illustrative purposes I have elected to show the invention in the form of an insole for free insertion in an article of footwear. In all figures of the drawings the invention is illustrated in inverted position for purposes of clarity and to illustrate better how the pockets for the various types of lifts are formed.

In each illustrated embodiment of the invention there is shown an insole for disposition in the shoe or the like beneath the right foot of the user. It will be understood that allochiral devices are utilized for the left feet. The first embodiment illustrated in Figures 1 and 2 includes an insole made up of several laminations comprising a cushion sheet or lamination 1 that is preferably a thermoplastic foam, a cover sheet or lamination 2 which may satisfactorily be an unsupported thermoplastic film, and a sheet or partial lamination 3 which may be of the same material as the cover sheet 2. The lamination 3 is of lesser area than the other two laminations, and is the pocket forming lamination.

In this first embodiment of the invention, the lamination 3 extends transversely across the insole in the region of the metatarsal arch of the foot as clearly seen in Figure 1. The three laminations are preferably sealed together, electronically or otherwise, at the bounding edges of laminations 1 and 2, and thus the side edges of the partial lamination 3 is joined to the other laminations in the same heat sealed seam as indicated at 4. Thus, the lamination 3 forms a pocket 5 in conjunction with the adjacent lamination 1. The heat sealing operation is preferably done in such a manner that there is a curvate margin, as indicated at 6, on the cushioning sheet 1, and such enables the insole to better fit within an article of footwear such as a shoe, and present a flat upper surface to the foot of the user.

Many thermoplastic materials are suitable for the manufacture of the instant invention, but by way of example, and not by way of limitation, I may mention that for the cushioning sheet 1 a vinyl foam, made from a liquid composition generically known as a plastisol is satisfactory. The plastisol is expanded and cured to form a structure having open communicating cells. The cover sheet 2 may be an unsupported vinyl film as may the partial lamination 3 but such vinyl film would result from a calendaring of resins and plasticizers so as to produce a considerably denser sheet, there being no expansion in the process.

A device so constructed may be given substantially any desired color, and the cover lamination 2 as well as the partial lamination 3 may have any desirable external finish, such as plain, mottled, grained, leather-like, etc. It should also be noted that the entire device may be laundered whenever deemed necessary and is extremely quick drying. Other advantages of the particular materials utilized are more fully set forth in my co-pending application entitled Foot Cushioning Devices and Process of Making the Same, filed September 12, 1956, Serial No. 609,453.

While the pocket 5 may be closed along one transverse edge, if so desired, it is not all necessary. The pocket may be left open in the character of a complete loop. Inside the pocket, in this embodiment of the invention, a lift 7 is freely inserted, this lift being shaped and sized to lend support to the metatarsal arch of the foot. The insert or lift 7 may be of the same material as the cushioning sheet 1, and of any desired or necessary thickness. The soft cleaning contact of the foam material, and especially the combined contact between the sheet 1 and the lift 7 will effectively prevent the lift from shifting position once it is located properly in the pocket.

It will be noted particularly that by virtue of the construction of the instant invention, the lift 7 may readily be removed and replaced. Consequently, as a foot responds to the corrective pressure of the appliance, a

lift of lesser thickness may be substituted for the first lift, and so on, until no lift may be necessary. At the same time the appliance lends corrective pressure to the part of the foot most requiring the same, the appliance also cushions the entire foot and provides a soothing and beneficial massaging action on the foot during use by virtue of air being pumped in and out of the intercommunicating cells of the foam elements during the variations of pressure in walking. These foam elements also provide adequate ventilation during use.

It should also be noted that the device is extremely long lived, and so constructed that excess wear does not occur in the region of the added lift. The pocket forming lamination further eliminates any adverse or uncomfortable effect of abrupt edges on the lift since there will be a gradual transference of pressure by virtue of the foot resting upon the laminations, and particularly when the lift is disposed underneath the cushion lamination 1 as shown in the drawings.

In Figures 3 and 4 I have illustrated a slightly different form of the invention wherein the laminations 1 and 2 are substantially the same as above described. In this instance, however, the pocket forming partial lamination 8 is disposed at the heel end of the insole, and may be united to the other laminations at the sides and around the back of the heel in the same heat seal seam 4. In this instance, the pocket is opened at the forward end thereof to accommodate a freely inserted insert or lift 9 which provides added elevation beneath the heel of the user.

If so desired, the cushion lamination 1 may be provided with an aperture 10, and the lift with a coinciding aperture 11, whereby the resultant appliance will afford affective relief for such an ailment as a spur heel or the like. Here again, the lift 9 may be removed and replaced whenever desired, or a new lift of different thickness substituted therefor.

Another variation of the invention is disclosed in Figures 5 and 6 wherein the same cushion lamination 1 and cover sheet 2 are heat sealed together at the bounding edges as indicated at 4. In this instance, the pocket forming partial lamination 12 is disposed transversely of the device in the region of the longitudinal arch of the foot. The pocket lamination is joined along its side edges in the same heat seal seam 4 that unites the laminations 1 and 2. Beneath the lamination 12 is a longitudinal arch lift 13 which also may be of the same cushioning material as the sheet 1, and of any desirable thickness. In this instance, however, the lift 13 is shown joined to the other laminations at the same heat seal seam 4 along the side edges. However, since the respective laminations and lift are only joined at the bounding edges of the sheets 1 and 2 and are unsecured to each other elsewhere in the preferable form, an insert may, if desired, be placed between the partial lamination 12 and the lift 13 or between the lift 13 and the cushioning sheet 1, or in both locations. Thus, while a comfortable elevation for the longitudinal arch is provided in the appliance itself, that elevation may be graduated by the insertion of a lift in either of two pockets or in both as may be desired.

The final illustrated embodiment of the instant invention is shown in Figures 8 and 9 and also discloses the use of the same cushioning sheet 1, the cover lamination 2, and the heat seal seam at the bounding edges thereof indicated at 4. In this embodiment, a partial lamination or a pocket forming sheet 14 extends transversely across the device in the region of the longitudinal arch, the lamination being narrower on the outer side of the arch and wider on the inner side. Beneath this pocket forming lamination 14 is a lift 15 which extends under the inner longitudinal arch only, and in the illustrated instance this lift is substantially in the shape of a half moon. This lift at the inner edge of the structure may be secured to the other laminations in the heat seal seam 4, if so

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desired. However, the lift as well as the other laminations are preferably unsecured to each other everywhere except at the heat seal seam 4, and therefore there is a pocket 16 adjacent to lift 15 and beneath the narrow side of the partial lamination 14 to accommodate an added lift if so desired. Likewise, an added lift may be inserted between the pocket forming lamination 14 and the lift 15, or between the lift 15 and the cushion sheet 1, or in both places if so desired. Here again great selectivity is provided in the thickness of a lift or lifts, and at the same time the finished appliance will lend comfortable support to the inner longitudinal arch.

In view of the foregoing disclosures, it will be apparent that the instant invention may be so constructed as to incorporate one or more lifts in substantially any desired location. It should further be especially noted that regardless of the disposition of the pocket forming partial lamination or of the lifts themselves, the manufacture of the instant invention is extremely economical. This is particularly true when the cushion sheet 1 and the cover sheet 2 are identical in size through a series of appliances designed for lifts in different locations. It is simply necessary to place the pocket forming partial lamination in position with or without a lift therebeneath, and this partial lamination is fixed in position at the same time and by the same means that join the cushion sheet 1 and the cover sheet 2 together. Thus, many steps in the manufacture of appliances with various locations of the

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lifts that were necessary heretofore have been eliminated by the provision of the instant invention.

It will be understood that modifications and variations may be further effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

A laminated foot cushioning device, comprising a cushion sheet, a cover sheet, a second cover sheet partially overlying a face of the cushion sheet, all three sheets joined by a heat sealed seam at the bounding edges of the first two said sheets, and a lift interposed between said second cover sheet and the adjacent cushion sheet, and said lift being also secured by said heat seal seam at its outer edge.

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