

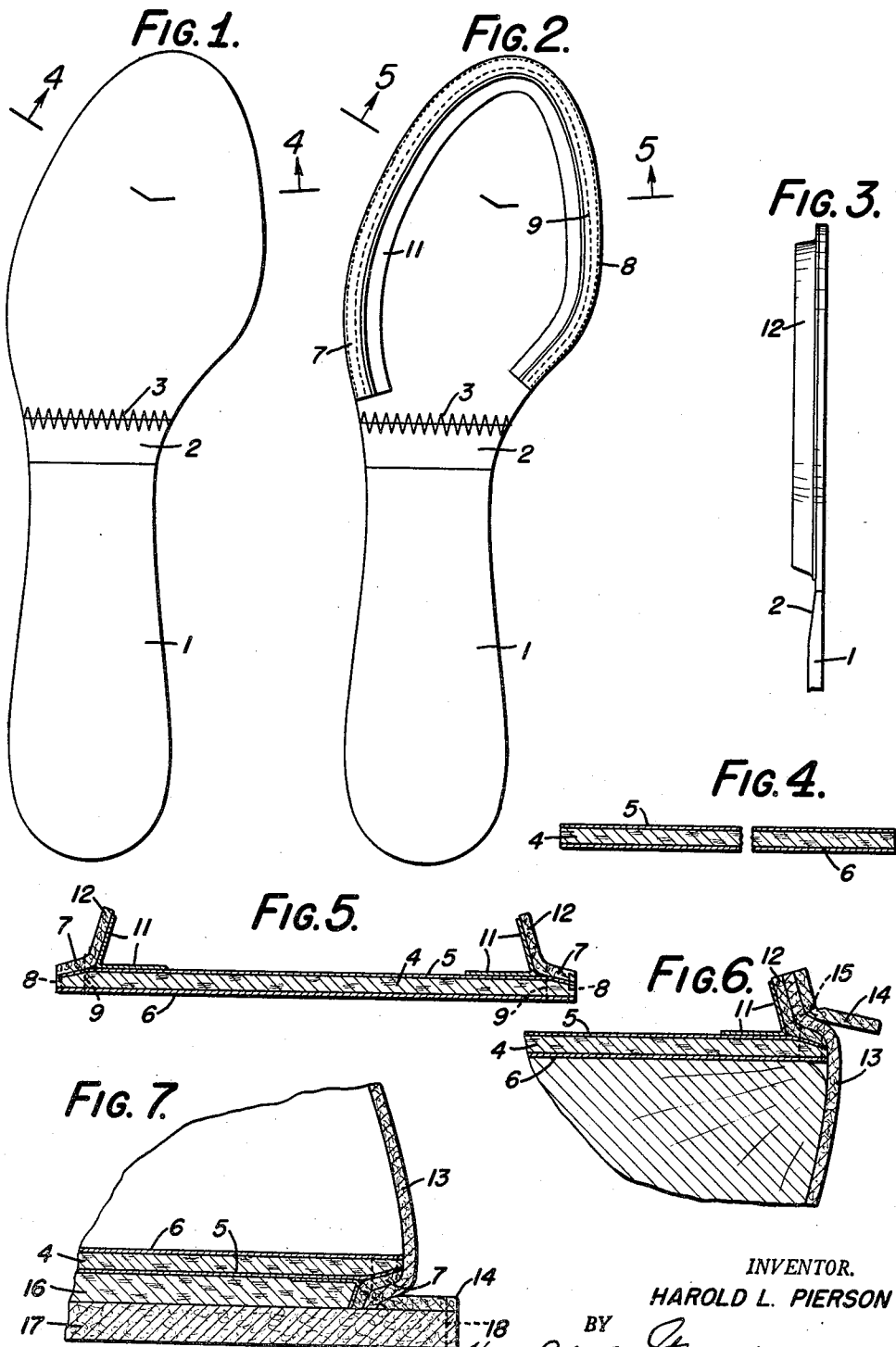
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CUSHION INSOLE FOR WELT SHOES

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CUSHION INSOLE FOR WELT SHOES

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1 Claim. (Cl. 36—22)

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This invention relates to a shoe structure with more particular reference to the general type of shoe in which an upper and welt are attached to an insole, and an outsole thereafter stitched to the welt, and it has for its purpose to afford a shoe of extremely light weight and maximum flexibility, in which the inner sole presents a soft resilient surface to the foot of the wearer, resulting in greater comfort, also a construction that is economical to manufacture and characterized by durability and long wearing qualities.

In shoes of this type as heretofore constructed, it has been difficult to attain all the desirable objectives, since a shoe with practical durability has been somewhat stiff and uncomfortable, and while some shoes have been constructed with various types of cushion insoles, such insoles have not held up for long but quickly wear or disintegrate and present rough uneven spots to the foot of the wearer, resulting in no little discomfort after the shoe has been worn for a short time, and it is a further purpose of the invention to afford a construction that will present maximum flexibility and softness of insole, resulting in a greater degree of comfort than heretofore, while at the same time producing a light-weight shoe in which the insole retains the desirable degree of softness, resiliency and flexibility throughout the life of the outsole.

Another difficulty that has heretofore been encountered in the construction of sewed shoes with cushion insoles has been in attaching a sewing rib to the insole since cemented methods of attaching a sewing rib have proved unsuccessful, and where the sewing rib is attached by stitching, the line of stitching causes a breakdown or disintegration of the cushion layer, and it is another object of this invention to afford an insole of such construction that a sewing rib may be attached thereto by stitching without lessening the resiliency and softness of or otherwise affecting the insole, and an upper and welt can be stitched to the sewing rib without breaking or affecting the life of the stitching which secures the sewing rib to the insole, as a result of which the insole affords maximum flexibility and softness to the same extent when the outsole has been worn considerably as when the outsole is in its original state of newness.

An additional purpose of the invention is to afford a sewed shoe with an insole that furnishes extreme softness, resiliency, and flexibility uniformly and continuously throughout the entire area of the ball and toe portion of the foot with the insole extending entirely from one side of

the shoe or upper to the opposite side thereof and so constructed and connected to the upper as to afford substantial wear and durability that equals the life of the outsole and retains the original degree of softness, flexibility, and comfort throughout the life of the outsole.

To these and other ends, the invention consists in the construction and arrangement of parts that will appear clearly from the following description when read in conjunction with the accompanying drawings, the novel features being pointed out in the claim following the specification.

In the drawings:

Fig. 1 is a plan view of an insole such as employed in constructing a shoe in accordance with a preferred embodiment of the invention;

Fig. 2 is a similar view of the insole after attachment of the sewing rib and reinforcing tape;

Fig. 3 is a view in edge elevation of the same;

Fig. 4 is an enlarged detail sectional view on line 4—4 of Fig. 1;

Fig. 5 is a sectional view on line 5—5 of Fig. 2;

Fig. 6 is an enlarged detail sectional view partially broken away showing the position of the parts on a last after an upper and welt have been stitched to the sewing rib, and

Fig. 7 is an enlarged detail sectional view showing the position of the parts after an outsole has been stitched to the welt.

Referring more particularly to the drawings in which like reference numerals refer to the same parts throughout the several views, the insole comprises a soft, flexible, resilient and slightly compressible forward ball and toe portion, and a shank and heel portion designated at 1 which is preferably symmetrical in form and composed of stiff fiberboard or other suitable stiff material. The shank portion is slightly thicker than the forward ball and toe portion and bevelled slightly at its forward edge as indicated at 2 to a thickness approximating that of the forward portion.

The forward edge of the rear shank portion is along a straight line perpendicular to the longitudinal axis of the rear portion 1 and the straight forward edge of the rear portion butts against the straight rear edge of the forward ball and toe portion, forming a butt joint therewith, the forward and rear portions being connected by zigzag stitching 3 which extends across the butt joint and penetrates the adjacent surfaces of the forward and rear portions of the insole. By forming the rear shank and heel portion symmetrically, it is possible to use the same units

for both right and left shoes, thus simplifying and reducing materially the cost of manufacture, and by providing a zigzag-stitch connection between the adjacent parts of the stiff rear shank and heel portion and the flexible, soft forward portion, these portions are permanently connected in such a manner as to prevent any relative endwise movement between the forward and rear portions while at the same time permitting the necessary swinging or hinging movement of the forward portion with relation to the rear portion so as to permit flexing of the forward or ball portion of the shoe.

A relatively thick, stiff shank and heel portion is essential for holding an outer sole and giving proper support to the arch and heel portions of the foot, and a main object of the invention is to provide such a shank and heel portion while connecting it to a forward ball and toe portion that is sufficiently soft, light-weight, resilient and flexible to afford satisfactory comfort to the wearer, also to permit incorporating the insole in a neat, trim, and light-weight sewed shoe with satisfactory durability and wearing qualities, thus overcoming one of the greatest problems in shoe manufacture, namely, to construct a soft and flexible light-weight sewed shoe that will wear as satisfactorily as shoes in which the forward part of the insole is stiffer and heavier.

Heretofore it has been necessary to employ an insole having a relatively stiff, hard forward portion on which the ball of the foot rests, in order to impart sufficient strength and durability to the shoe, and this objection has been successfully overcome by the present invention through the instrumentality of an insole forward portion of several layers or plies of selected material as will now be described in detail.

The forward portion of the insole comprises an intermediate cushion layer 4 that is cut from a sheet of soft, slightly compressible, readily flexible and resilient material, preferably a highly compressed composition of cork and latex, and attached over one entire surface of the intermediate cushion layer 4 is an outer strengthening layer 5 that is cemented to the cushion layer by means of latex or other suitable cement extending entirely across the meeting surfaces, the strengthening layer 5 preferably consisting of a thin, light-weight, loosely woven fabric.

Satisfactory results have been obtained by the use of light-weight, loosely woven cotton print cloth which acts to hold the intermediate cushion layer 4 securely and to prevent spreading or disintegration of the cushion layer after a period of time, thus imparting the necessary strength to the intermediate cushion layer to permit stitching therethrough without fracturing or injuring the cushion layer when the sewing rib is fastened thereto by stitching.

The strengthening layer 5 of loosely woven cotton fabric also establishes a secure bond with the intermediate cushion layer through adherence of the cement between the fibers of the strengthening layer and to the rough surface of the intermediate cushion layer.

On the opposite surface of the intermediate cushion layer 4 there is provided an inner layer 6 preferably cut from a thin, light-weight, soft leather split which has a roughened surface on both sides similar to the flesh side of a leather split, with one of said surfaces attached entirely across the opposite surface of the intermediate cushion layer 4 by means of latex or other suitable cement while the other surface of the leather

split faces the interior of the shoe when incorporated therein.

In manufacturing practice, a large sheet of material from which the outer strengthening layer 5 is formed is cemented to the entire surface of a large sheet of compressed cork and latex from which the intermediate cushion layer 4 is cemented, and from this large laminated sheet there are cut by means of suitable dies pieces corresponding to the shape of the forward ball and toe portion of the insole, after which a similarly cut leather split layer is cemented to the entire inner surface of the intermediate cushion layer 4. When completed, the three layers 4, 5 and 6 are all coextensive with each other and each is of uniform thickness throughout its extent, while the forward portion of the insole which is composed of the three layers 4, 5 and 6 is also of uniform thickness throughout its extent and approximately the same thickness or of somewhat less thickness than the rear shank and heel portion 1 to which it is connected.

The intermediate cushion layer is preferably about $\frac{1}{8}$ " in thickness, the inner leather split layer is quite thin preferably about $\frac{1}{16}$ " in thickness, and the outer strengthening cotton layer is somewhat thinner than the inner layer and light-weight, yet sufficiently strong to retain the intermediate cushion layer permanently in its original form and prevent spreading or fracturing thereof when stitching is applied through the insole. Thus there is afforded an extremely flexible and soft, yet thin, light-weight, resilient and durable forward portion of the insole which extends entirely across beneath the ball and toe portion of a foot and gives a soft, yieldable, and extremely flexible support, to insure maximum comfort combined with durability and wearing qualities equal to that of considerably stiffer and heavier shoes which lack the desirable comfort, softness and flexibility.

After the insole as above described and shown in Fig. 1 is completed, a sewing rib is secured thereto, said sewing rib comprising an attaching portion 7, the edge of which coincides with the edge of the insole. The attaching portion 7 of the sewing rib is positioned against the outer strengthening layer 5 and is secured to the insole by an outer line of stitching 8 extending through the attaching portion 7 and the three layers of the insole along a line in close proximity to the edge of the insole, while 9 designates an inner line of stitching extending through the attaching portion 7 and the three layers of the insole and spaced from the outer line of stitching 8 a substantial distance, depending upon the thickness of the upper, or upper and lining, to be secured to the sewing rib. The inner line of stitching 9 may be located closer to the outer line of stitching 8 where a thin upper, or upper and lining, is used, and spaced further from the outer line of stitching 8 where a thicker upper, or upper and lining, is used, and in this manner ample room is afforded to accommodate the upper and welt between the sewing rib and the edge of the insole regardless of the thickness of the upper.

The lines of stitching 8 and 9 compress the intermediate cushion layer 4 slightly and consequently the entire insole at the edge portion thereof beneath the attaching portion 7 of the sewing rib, causing the attaching portion 7 to bend somewhat around the edge of the last when the upper is lasted thereon so that when the upper is stitched to the sewing rib, the needle which travels in an arc clears the inner row of

stitching 9, and there is no tendency for it to intersect or break the line of stitching 9 when attaching the upper to the sewing rib.

After the sewing rib is in position, a reinforcing tape 11 is attached by cement between the upstanding portion 12 of the sewing rib and the adjacent surface of the outer fabric layer 5, as shown in Fig. 2, and as customary in applying strengthening tape to an insole and sewing rib. Following the attachment of the sewing rib and reinforcing tape, the upper 13 and welt 14 are stitched to the upstanding portion 12 of the sewing rib by a line of stitching 15 extending through the welt, upper, and sewing rib.

The stitching is effected on an inseaming machine when the insole is on the last, and by reason of the fact that the outer area of the insole is compressed slightly and the attaching portion 7 extends slightly downwardly around the last, when the inseaming needle passes through the portion 12 of the sewing rib, it travels in an arc above the inner line of stitching 9 and clears the inner line of stitching that unites the sewing rib to the insole. Thus the operation of attaching the upper and welt to the sewing rib does not in any way affect the secure attachment between the sewing rib and insole since the respective lines of stitching do not cross or interfere one with the other. It is to be understood that the upper and welt may be attached in one operation or in separate operations, as well known in the art of attaching uppers and welts to an insole sewing rib.

After the parts are thus assembled, the upper and sewing rib are trimmed down close to the line of stitching connecting them, and the recess formed between the exposed edges of the upper and sewing rib is filled by means of an insert 16 consisting of a sheet of compressed composition of cork and latex cut to fit in the recess and cemented to the outer layer 5 of the insole. Following this, the outer sole 17 is stitched to the welt 14 as indicated at 18, with a thin layer of cement preferably applied between the outer sole 17 and the resilient insert 16.

While the invention has been described with reference to the particular construction herein shown, it is not confined to any particular details

and this application is intended to cover such modifications and departures as may come within the purposes of the improvements and the scope of the following claim.

I claim:

A shoe insole having a forward ball and toe portion comprising a flexible resilient and slightly compressible intermediate cushion layer consisting of a sheet of compressed composition of cork particles bonded with latex cement, a strengthening outer layer of light-weight loosely woven cotton fabric cemented to one entire surface of the cushion layer and coextensive with the cushion layer, and a soft light-weight leather split inner layer cemented to the entire opposite surface of the cushion layer and coextensive therewith, said forward ball and toe portion being of uniform thickness throughout and each of said three layers composing the same being of uniform thickness throughout, a rear shank and heel portion that is thicker than the forward ball and toe portion and constructed of material having the stiffness of stiff fiberboard and connected to said forward portion, and a sewing rib including an attaching portion abutting said fabric outer layer with its edge coinciding with the edge of the insole, said attaching portion being secured to the insole by inner and outer lines of stitching the outer of which is in close proximity to said edge and the inner of which is substantially spaced from the outer line of stitching.

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