

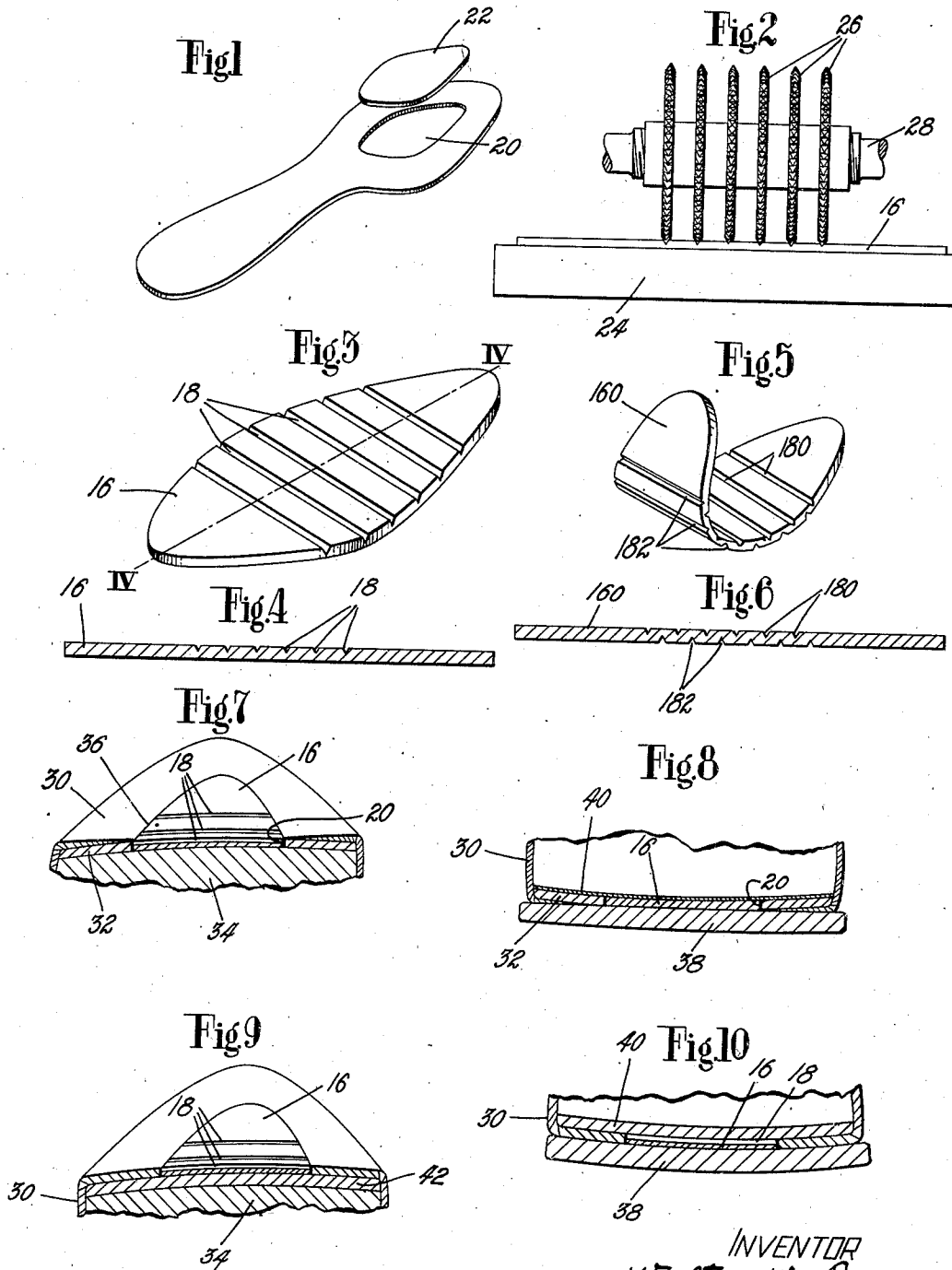
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FLEXIBLE SHOE AND METHOD OF MAKING SAME

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UNITED STATES PATENT OFFICE

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FLEXIBLE SHOE AND METHOD OF MAKING
SAME

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3 Claims. (Cl. 12-142)

This invention relates to improvements in the manufacture of shoes with flexible foreparts.

In a copending application, Serial No. 151,884, filed July 3, 1937, in the name of M. E. Duckoff, there is disclosed a method of making flexible shoes which involves the making of a laminated sole blank by cementing together a layer of insole material and a layer of outsole material, splitting the laminated blank into a skeleton insole having an opening in its forepart and an outsole having a forepart projection or "island" complementary to the insole opening, and the use of the insole and outsole thus formed in the making of a shoe wherein the outsole projection is interfitted within the opening in the insole. The application referred to also discloses the expedient of forming transverse grooves in the outsole projection for the purpose of enhancing the flexibility of the forepart of the shoe bottom.

One object of the present invention is to provide an improved method of making shoes having flexible foreparts the practice of which will produce shoes embodying improved features of construction and which will result in the making of substantial savings in the cost of the materials employed and the shoemaking operations involved.

In the practice of my improved method, as herein exemplified, a skeleton insole may be employed in connection with an outsole having no forepart projection and in making the shoe, after the margin of the upper has been secured in overlapped relation upon the skeleton insole, a filler piece, which may be the portion removed from the insole in the process of skeletonizing it and which has been provided at one side, or at both sides, with a plurality of transverse grooves to render it more flexible, is inserted within the opening in the insole, and thereafter the outsole is laid and attached in any suitable manner, as for example by being cemented to the overlapped margin of the upper. Desirably cement may also be applied between the outsole and the filler piece to hold the latter in place. In the shoe thus produced, the filler piece fills the forepart opening in the insole as effectively as it would be filled by an integral "island" upon the outsole. The cost of manufacturing the shoe, however, is substantially reduced inasmuch as it is unnecessary to provide a laminated blank or to produce inner and outer soles having complementary portions by splitting them from a common blank. The invention is also applicable to the manufacture of shoes wherein an imperforate insole is employed in place of a skeleton insole, in which

case the filler piece serves to fill the bottom cavity within the overlapped margins of the upper materials. Regardless of the type of shoe in which it is used, however, the filler piece performs its functions without detracting from the flexibility of the shoe bottom, the transverse grooves in the filler piece permitting the latter to bend freely as the foot is flexed in walking. Moreover, because of its grooved construction the filler piece may be made of sufficiently solid or even relatively stiff material so that it will serve as an adequate backing for the tread sole but will still, because of its grooved construction, bend or flex readily to accommodate the flexure of the foot.

The invention will be explained with reference to the accompanying drawing, in which

Fig. 1 is a perspective view of a skeleton insole showing also the portion which is removed from the forepart of the insole by the skeletonizing operation;

Fig. 2 is a front elevational view of a filler piece grooving device showing the device in operation upon a filler piece;

Fig. 3 is a perspective view of a shoe bottom filler piece having a plurality of transverse grooves in one side thereof;

Fig. 4 is a sectional view on the line IV-IV of Fig. 3;

Fig. 5 is a perspective view of a shoe bottom filler piece which has been transversely grooved upon both sides, the filler piece being shown in a flexed condition;

Fig. 6 is a longitudinal sectional view of the filler piece shown in Fig. 5;

Fig. 7 is a view partially in cross-section and partially in perspective of a shoe embodying a skeleton insole and a grooved filler piece, the shoe being shown as it appears before the outsole has been applied;

Fig. 8 is a cross-sectional view of the shoe as it appears after it has been completed;

Fig. 9 is a view, partially in cross-section and partially in perspective, of a shoe embodying an imperforate insole and a grooved filler piece, the shoe being shown as it appears before the outsole is applied; and

Fig. 10 is a cross-sectional view of the shoe shown in Fig. 9 as the shoe appears after it has been completed.

Referring to the drawing, I have shown in Figs. 3 and 4 a shoe bottom filler piece 16 of the required shape and thickness to fill or substantially to fill the bottom cavity in the forepart of a shoe, the filler piece being shaped, in edge contour,

substantially as shown, and having a plurality of transverse grooves or indentations 18 in one side thereof. I prefer to form such filler pieces by cutting them by means of a die from sheets of firm resilient material such as the fibrous composition or so-called "manufactured" insole material which is commonly employed commercially as a substitute for leather. The filler pieces may, however, be formed of other material, such as fiberboard, leatherboard, cardboard or the like. For use in shoes having skeleton insoles the portions of the insoles which are removed in the process of skeletonizing them may be employed as the filler pieces. For example, an insole may be skeletonized by a die-cutting operation as the result of which an opening 20 (Fig. 1) is formed in the forepart of the insole and a cut-out piece 22 is produced which is ordinarily wasted. This piece 22, however, is of the same size and shape as the opening 20 and may be utilized as a filler piece thereby eliminating the expense of additional precutting operations and additional material. In order to provide for a maximum amount of flexibility in the shoe bottom, however, it is proposed to form transverse grooves or indentations in the filler pieces before they are applied to the shoes. Conveniently, the grooving may be accomplished as illustrated in Fig. 2 by feeding the filler pieces over a work table 24 and beneath a series of cutter disks 26 which are secured in spaced relation on a driven shaft 28. As herein illustrated, the grooves in the filler piece are V-shaped in cross-section, although they may be made of any other shape which may be found desirable. Moreover, the filler pieces may be grooved at both sides, as illustrated in Figs. 5 and 6, wherein a series of grooves 180 are formed in the upper side of a filler piece 160 and a similar series of grooves 182 are formed in the lower side of the piece, the grooves 182 being staggered with relation to the grooves 180 to avoid unduly weakening the filler piece and to increase the lines along which the bending or flexing will occur.

The filler pieces may be used as fillers for the bottom cavities of shoes having imperforate insoles or they may be used to fill the insole openings in shoes having skeleton insoles. The filler pieces may be of symmetrical outline, so as approximately to fill the bottom cavities, or they may be formed of non-symmetrical outline such as to adapt the pieces to fit more accurately within the bottom cavities. In the latter case the filler pieces may be grooved on one side for use in right shoes and upon the other side for use in left shoes. If, however, each filler piece is grooved upon both sides, as shown in Figs. 5 and 6, a non-symmetrical filler piece shaped to fit the bottom cavity of a right shoe may be inverted and thus adapted accurately to fit the bottom cavity of a left shoe. Thus, by grooving the filler pieces upon both sides not only are they made even more flexible but also it becomes unnecessary to furnish them in rights and lefts and in applying them no care need be exercised to insure that they will be positioned "right side up" in the shoes.

In its application to the manufacture of shoes having skeleton insoles my improved filler piece is applied after the margin of the upper has been secured in overlapped position upon the insole, as indicated in Fig. 7, wherein an upper 30 and a skeleton insole 32 are shown on a last 34 and the grooved filler piece 16 is shown accurately fitting within and filling the forepart opening 20

in the insole. As shown, the margin of the upper has been trimmed and beveled to a thin edge 36 which coincides with the edge of the insole opening 20. The beveled surface of the upper margin functions in conjunction with the outer surface of the filler piece to provide a substantially flush and level surface throughout the width of the shoe bottom for the reception of the outsole 38 (Fig. 8). The outsole may be attached by cement or otherwise and advantageously cement may be applied between the filler piece and the outsole at least to a sufficient extent to hold the filler piece in place. As shown, a sock lining 40 is applied to the inside of the shoe bottom to cover the skeleton insole and the filler piece.

If the filler piece is to be employed to fill the bottom cavity between an outer sole and an imperforate inner sole, it may be applied as indicated in Figs. 9 and 10 and cemented to either the outsole 38 or to the insole 42 or to both soles. If the outsole is to be cement attached a sufficient quantity of cement will ordinarily be squeezed inwardly from the margins of the upper and the outsole to cause the filler piece to adhere to the outsole. An advantageous construction is to employ a filler piece which is grooved at one side only, to position the piece so that the grooved side will face the outsole, and to secure the filler piece, as by means of cement to the insole only, thus leaving the grooved side of the filler piece unattached to the outsole to provide for free relative creeping movement between these parts as the shoe bottom is flexed and the grooves are opened and closed more or less during the wearing of the shoe. It may, however, be found desirable to avoid cementing or otherwise securing the filler piece to either sole.

In practice it has been found that my improved filler pieces, being made of firm and resilient but inexpensive material, such as that above referred to and having been grooved as described, are capable of bending or flexing as freely as filler pieces of felt or similar soft material along lines transverse to the shoe bottom and are thus well adapted to accommodate the bending movements of the foot. On the other hand, these filler pieces offer substantial resistance to bending about lines extending lengthwise of the shoe and thus tend to preserve the shape of the shoe bottom. The improved filler pieces, being of firm and not readily compressible material, provide adequate backing for the outsoles, supporting the latter so that they will not yield when encountering small projections or irregularities upon the ground and cannot be readily pressed out of shape or "thumbed" by a customer seeking to test the firmness of the shoe bottom construction.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. That improvement in methods of making flexible shoes which consists in removing the central forward portion of an insole thereby skeletonizing the insole and providing a filler piece for the opening in the insole, forming a series of transverse cuts in both sides of said filler piece, placing the skeletonized insole on a last, working an upper over the last and securing its margin in overlapped position upon said insole, beveling the upper margin, inserting said filler piece within the opening in said insole thereby filling the bottom cavity within the edges of the beveled upper margin, and attaching an outsole.

2. That improvement in methods of making flexible shoes which consists in removing the central forward portion of an insole thereby skeletonizing the insole and providing a filler
5 piece complementary to the opening in the insole, forming a series of transverse cuts in said filler piece, placing the skeletonized insole on a last, working an upper over the last and securing its margin in overlapped position upon said insole,
10 inserting said filler piece within the opening in said insole, and attaching an outsole and securing it to said filler piece.

3. A shoe comprising an insole the central forward portion of which is removed to form an aperture therein, an outsole, an upper having its marginal portion beveled and intumed between said soles and secure in overlapped relation
5 to said insole, a separate filler piece positioned in the aperture in the insole and having a series of transverse cuts in both of its sides, and a sock lining covering said filler piece.

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