April 30, 1929. J. W. MAY 1,710,936

BOOT OR SHOE AND METHOD OF MAKING THE SAME

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Fig.1.

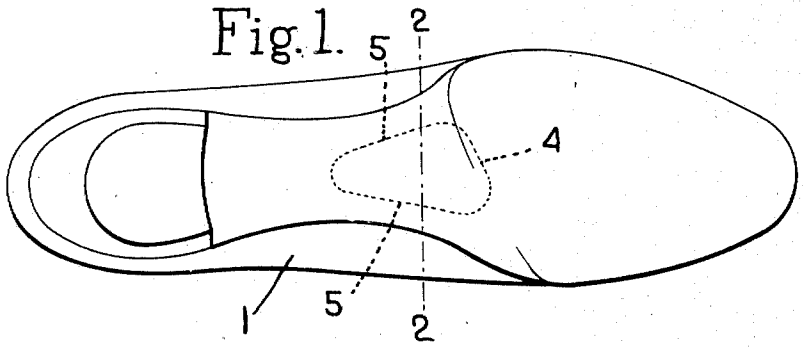


Fig.2.

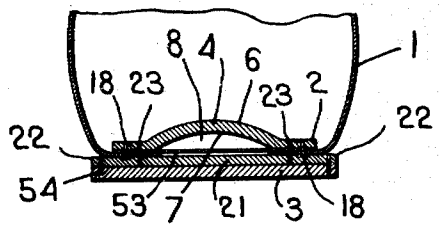


Fig.3.

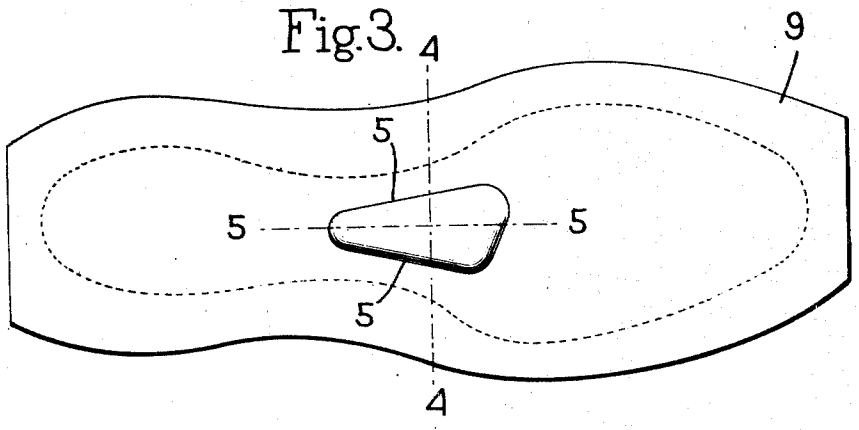


Fig.4.

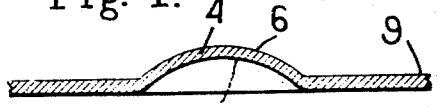
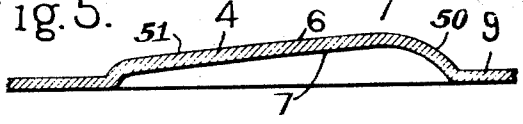


Fig.5.



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Fig.6.

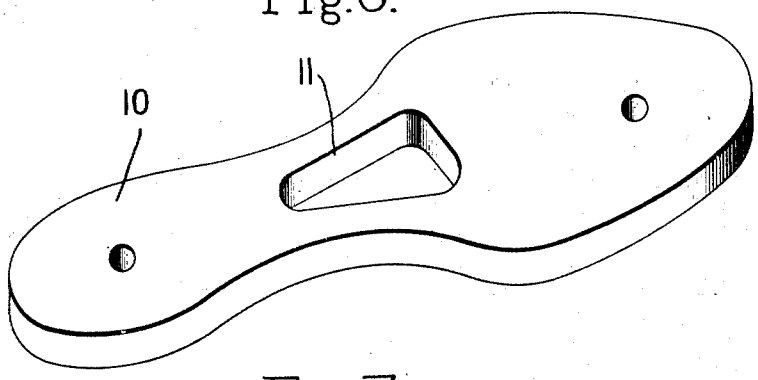


Fig.7.

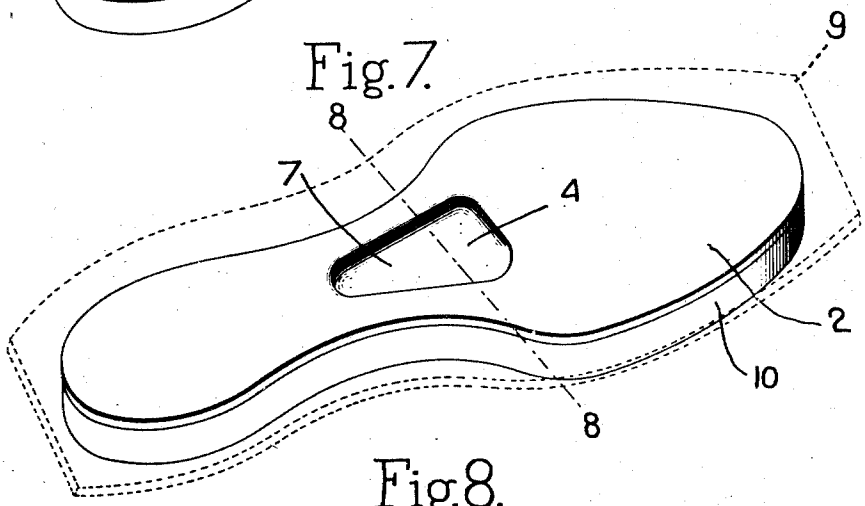


Fig.8.

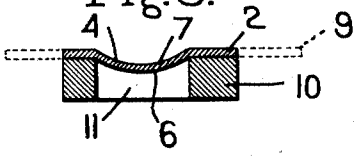


Fig.10.

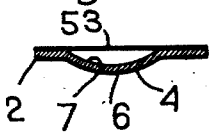
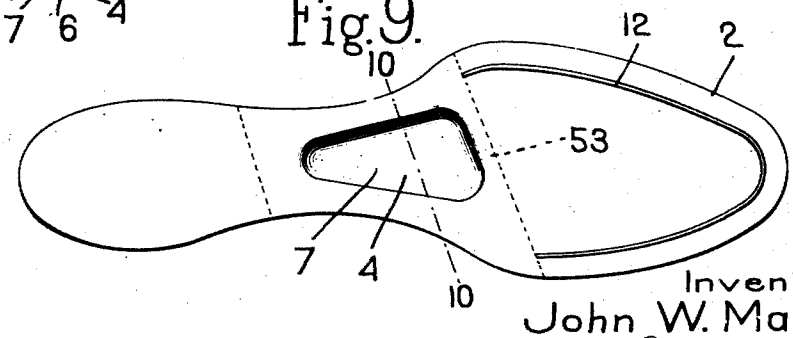


Fig.9.



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Fig. 11.

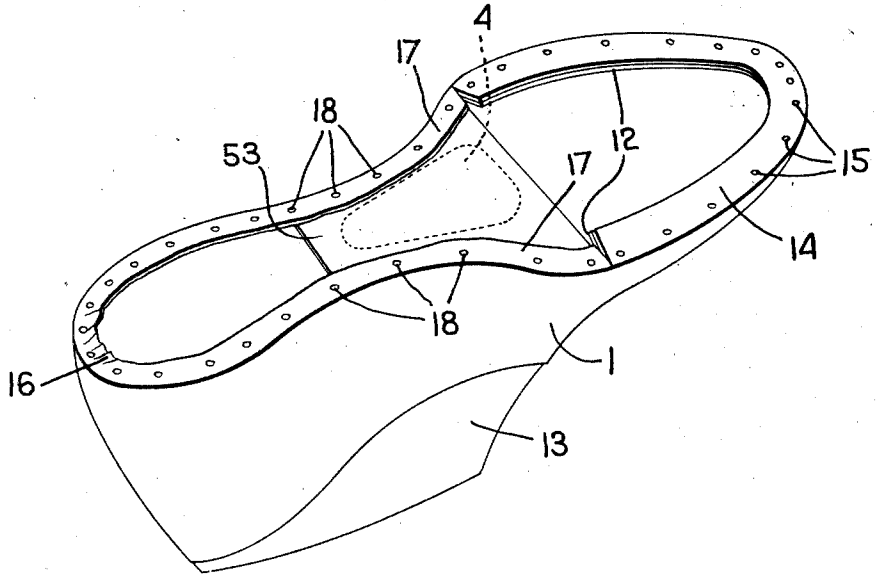
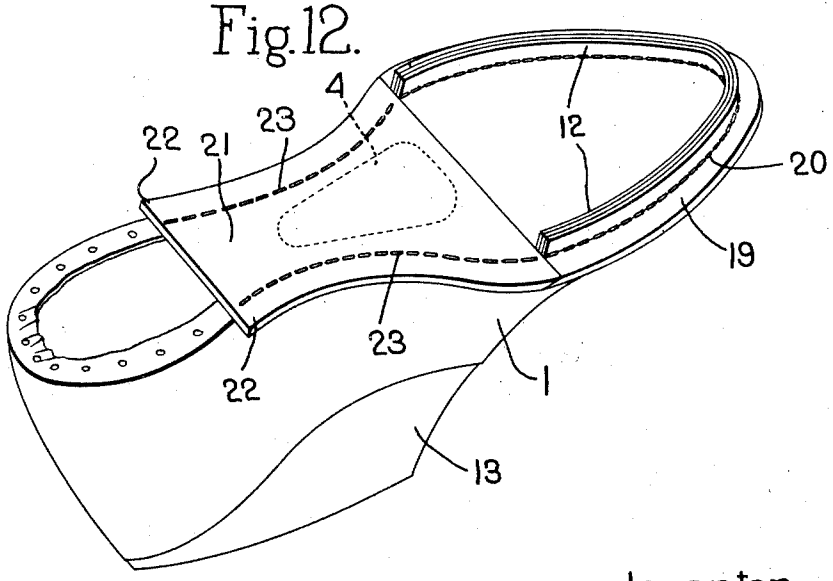


Fig. 12.



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BOOT OR SHOE AND METHOD OF MAKING THE SAME

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Fig. 13.

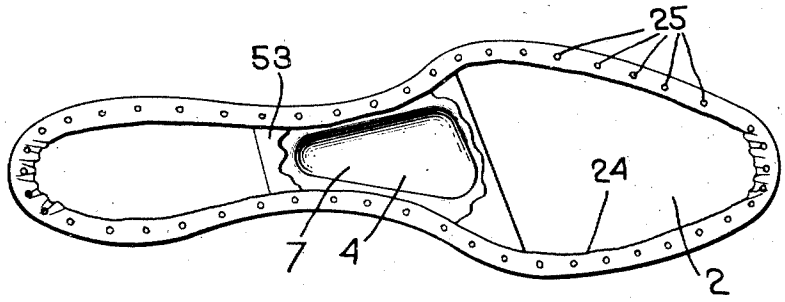


Fig. 14.

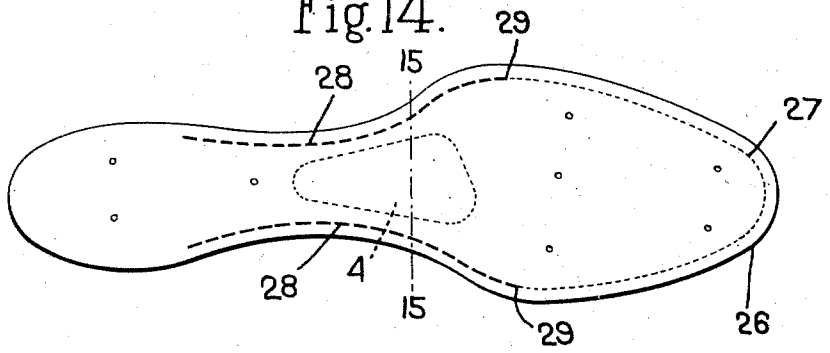
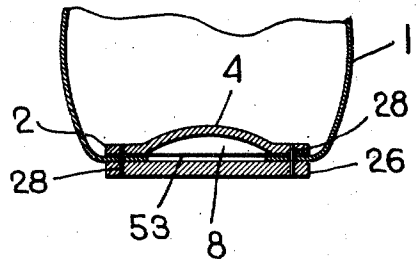


Fig. 15.



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UNITED STATES PATENT OFFICE.

JOHN WALTER MAY, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

BOOT OR SHOE AND METHOD OF MAKING THE SAME.

Application filed November 3, 1925. Serial No. 66,558.

This invention relates to a boot or shoe in which the insole is specially constructed to give support to the arch of the foot, and also to a novel method of making such a boot or shoe.

In a boot or shoe embodying my invention the insole is shaped so that it presents on its upper face a convex arch-supporting portion, the arch-supporting shape being secured by the shape given to the insole rather than by the introduction of a pad beneath the insole. One way of securing this desired shape to the insole is by moulding the insole so that it will present a hump or upwardly bent portion at the point where the support is to be given to the arch of the foot and this shape is preserved in the completed shoe after it is manufactured by the way in which the insole is incorporated in the shoe.

In carrying out my invention I first take an insole blank before it is trimmed to shape and subject it to the action of a die by which the portion thereof which is to constitute the support for the arch of the foot is deformed by being bent upwardly. After the insole has been thus treated it is placed on a pattern which forms the gauge for the purpose of trimming the insole to shape said pattern having an opening or recess of a size corresponding to the deformed portion of the insole so that when the insole is placed on the pattern for the purpose of being trimmed the deformed portion co-operates with the recess to position the insole properly with reference to the pattern. After the insole has been trimmed to the shape of the pattern then said insole may be incorporated in the shoe and the shoe when completed will have an arch-supporting portion produced by the shape given to the insole and without the introduction into the shoe of any pad or similar element.

The arch support made in accordance with my invention not only gives the proper support to the arch of the foot but it is flexible and yielding owing to the manner in which it is made and to the absence of the pad or support. The flexibility of the arch-supporting portion not only makes the shoe a comfortable one to wear but it also provides an arch supporting portion which will readily adapt itself to the shape of the individual foot.

My invention is especially applicable in the manufacture of ladies' shoes with a relatively narrow shank where it is desired to place the arch supporting feature in the narrow shank.

In order to give an understanding of the invention I have illustrated in the drawings some embodiments thereof and some methods by which the process may be carried out.

Fig. 1 is a bottom plan view of a shoe having my arch-supporting feature and showing in dotted lines the position of the arch support;

Fig. 2 is a section on the line 2—2, Fig. 1;

Fig. 3 is a view of the insole blank after it has been deformed to make the arch-supporting portion;

Fig. 4 is a section on the line 4—4, Fig. 3;

Fig. 5 is a section on the line 5—5, Fig. 3;

Fig. 6 is a perspective view of the pattern which is used for trimming the insole;

Fig. 7 illustrates the method of trimming the insole blank to the proper shape;

Fig. 8 is a section on the line 8—8, Fig. 7;

Fig. 9 illustrates an insole embodying my invention and designed for use in a welt shoe;

Fig. 10 is a section on the line 10—10, Fig. 9;

Fig. 11 illustrates a step in the process of making the shoe embodying my invention, said figure showing the shoe lasted ready for the attachment of the welt;

Fig. 12 illustrates the welt applied to the shoe ready for the attachment of the outsole;

Fig. 13 is a bottom plan view of a McKay sewed shoe embodying my invention and which has been lasted;

Fig. 14 is a bottom view showing the way in which the outsole is attached;

Fig. 15 is a section on the line 15—15, Fig. 14.

Referring first to Figs. 1 and 2 which show a welt shoe embodying my invention, 1 indicates the upper of the shoe, 2 the insole and 3 the outsole.

The insole is formed at the proper point with an arch-supporting portion 4 which may have any desired shape or location in the shoe. In the embodiment shown this arch-supporting portion 4 has the shape shown by the dotted lines in Fig. 1 and is located in the shank of the shoe directly back of the ball thereof. The arch-supporting portion 4 is wider at its forward end than at the rear end

and the sides 5 thereof follow in general the lines of the sides of the sole at this point.

In the direction longitudinally of the insole the arch-supporting portion 4 has a relatively-short front face 50 and a relatively long rear face 51, the front face 50 having a greater angle to the plane of the sole than the rear face 51. This brings the highest part of the arch-supporting portion toward the front thereof. The particular shape or outline of the arch-supporting portion, however, is not an essential feature of the invention and may be varied as desired.

This arch-supporting portion 4 is formed by deforming the insole so that within the outline indicated by the dotted lines Fig. 1 the insole has a convexly-curved upper surface 6 and a concavely-curved under surface 7 thus producing the pocket 8 beneath the arch-supporting portion. This arch-supporting shape 4 can be formed in the insole in any suitable way as by placing the insole between male and female dies which deform the portion of the insole and give it the shape shown in Figs. 1 and 2. When the insole is incorporated in the shoe the arch-supporting portion 4 retains its shape partly by the strength of the leather and partly by the way the shoe is made and without the introduction of any pad or other similar supporting element in the pocket 8.

In carrying out my invention I propose to form the insole with the arch-supporting portion while the latter is still in the form of an insole blank and before it is trimmed to shape. Such an insole blank is shown at 9 in Fig. 3 and it is larger than the insole, as such blanks usually are. This insole blank is treated so as to produce an arch-supporting portion 4 therein as above described and when it has been so treated it will have the shape shown in Figs. 3, 4 and 5, the central portion of the blank being deformed and given the concavo-convex shape.

After the insole blank has been thus formed it is then rounded or trimmed to the proper shape by the use of a pattern 10 such as is usually used for this purpose except that the pattern I propose to use is provided with a recess 11 of a shape corresponding to the shape of the arch-supporting portion 4 which has been formed in the insole blank 9. This recess 11 co-operates with the arch-supporting portion 4 to position properly the insole blank on the pattern durnig the rounding or trimming operation so that said arch-supporting portion is always properly placed relative to the outline of the insole.

To trim the insole blank it is placed on the pattern with the convex face 6 of the arch-supporting portion 4 fitting into the recess 11 as shown in Figs. 7 and 8 and while the insole blank is held in this position it is rounded or trimmed to the shape of the pattern, as shown in full lines Fig. 7, the dotted lines in said figure illustrating the original shape of the insole blank. By means of this operation an insole is produced in which the arch-supporting portion 4 always has the correct position relative to the outline of the insole.

After the insole has thus been shaped I apply to the under face thereof a reinforcing member 53 of canvas, duck or similar material, the purpose of which is to retain the shape given to the insole and to prevent the arch-supporting portion from flattening out due to a spreading of the insole at this point. This reinforcing member 53 may conveniently be cemented to the insole or secured thereto in any appropriate way. Said reinforcing member spans the concave face of the arch-supporting portion and helps to retain the shape given to the insole.

This reinforcing member 53 may be applied to the insole either before or after it is trimmed. In Fig. 9 I have illustrated the shape and position of the reinforcing member in dotted lines and in Fig. 10 it is also shown spanning the cancave face of the arch-supporting portion.

When the insole has thus been deformed and reinforced it is then incorporated into the shoe. The exact procedure of thus incorporating the insole into the shoe will vary according to the style or character of the shoe, the steps employed in the case of a welt shoe being somewhat different from those employed in the case of a McKay sewed shoe.

In the case of a welt shoe one way of proceeding is illustrated in Figs. 9 to 12 inclusive. The insole 2, after it has had the arch-supporting portion 4 formed herein, is channeled around the toe portion only to form the in-seam-receiving lip 12. The channel is not carried down the shank of the shoe as is usually done in the case of a welt shoe. After the insole has thus been channeled then it is applied to the bottom of the last 13 and the upper 1 is lasted, it being understood that the last will be provided with a pocket to receive the arch-supporting portion 4. During this lasting operation the edge of the upper around the toe of the shoe for a length corresponding to the length of the in-seam-receiving lip 12 is drawn over the edge of the latter and up against the lip, as shown at 14, and is temporarily tacked to the last by the tacks 15. At the heel of the shoe the edge of the upper is pulled over the insole and tacked in the usual manner, as shown at 16.

Along the shank portion of the shoe the lasting is done by pulling the edge 17 of the upper over the insole and tacking said upper to the insole by tacks 18. If desired, I may have the last at the shank portion provided with a metal face so that when the tacks 18 are driven they will be clinched over as shown in Fig. 2. After the shoe has thus been lasted the welt 19 is sewed to the lip 12 as usual by

means of the in-seam stitches 20. The welt, however, extends only throughout the length of the lip 12, that is, around the toe of the shoe and back to about the ball of the foot. At the shank of the shoe and overlying the arch-supporting portion 4 I place a reinforcing piece of leather 21 which extends from the rear of the lip 12 and welt 19 back to the heel portion. This reinforcing leather piece 21 is wider than the shank of the shoe so that it projects beyond the insole at each edge as shown at 22 and it is secured to the insole by suitable fastenings which extend through the edge of the upper. While any suitable fastening device may be employed I will preferably unite the insole and reinforcing piece 21 by means of stitches 23. These stitches may be inserted by hand or in any appropriate way and they extend from the rear of the in-seam stitches 20 back to the heel. The reinforcing piece 21 is wider than the insole and the projecting edge 22 forms in effect a continuation of the welt and provides an edge to which the outsole 3 may be sewed at the shank of the shoe.

After the shoe has reached the condition shown in Fig. 12 it may be finished by the usual steps or operations employed in making welt shoes, one of which is the sewing of the outsole 3 to the welt and to the edge 22 of the reinforcing piece 21 by means of the usual stitches 54. The shoe when completed will have the insole at the shank portion arched upwardly to form the arch-supporting portion 4 which is flexible and somewhat resilient.

Since the insole is securely fastened at both edges to both the reinforcing members 53 and 21, said members assist in preserving the arch shape of the insole-supporting portion 44 and prevent said portion from flattening down due to spreading of the insole at this point. The arch-supporting portion 4 and the members 21 and 53 form a true arch, the members 21 and 53 constituting the tension element of the arch and the portion 4 the compression element. The shape of the arch-supporting portion 4 is thus preserved partly by the inherent strength in the leather of the insole, partly by the action of the reinforcing members 21 and 53 in preventing the insole from spreading and partly by the body of air which is confined in the cavity 8. Where the member 53 is cemented to the bottom of the insole a substantially tight joint will be produced between the insole and the member 21 thus giving to the arch-supporting portion 4 somewhat the characteristic of a pneumatic pocket.

An arch support having this construction is flexible because of the absence of a relatively non-yielding pad beneath it and is thus comfortable to wear. It is also more or less resilient and it has the capacity of conforming to the shape of the individual foot. While the feet of every person have the same general characteristics yet each individual foot varies somewhat in shape and the arch-supporting portion embodying this invention has the advantage that because of its flexibility and elasticity it will conform to the shape of the foot instead of compelling the foot to conform to its shape.

In the case of a McKay sewed shoe the process of incorporating the insole in the shoe is slightly different.

The insole itself is made in the manner above recited, except that it is not provided with the in-seam-receiving lip 12. A McKay-sewed shoe will be lasted in usual manner by placing the insole on the bottom of the last and pulling the edge 24 of the upper over the edge of the insole and tacking the upper to the insole by tacks 25 all as usual. It will be understood, of course, that the last will be formed with a pocket of a shape and properly positioned to receive the convex face of the arch-supporting portion 4. The outsole 26 is then placed in position and the toe portion of the outsole is sewed to the insole through the edge of the upper by the usual McKay process, 27 indicating the line of stitches thus formed. The stitches 27 are formed on the usual machine that is used in making the McKay sewed line shoe. The machine made stitches 27, however, extend only from the toe back to the ball of the foot. At the shank the outsole is sewed to the insole by hand instead of by machine, the hand-made stitches being indicated at 28 and extending from the point 29 on each side of the shoe back to the heel. The reason for hand sewing the shank portion of the outsole to the insole is that in the case of a narrow shank shoe, such as shown in the drawings, there is not room on either side of the arch-supporting portion 4 to accommodate the horn of the McKay machine which is introduced into the shoe and if the stitches 28 were made by the McKay machine the horn would tend to break down the arch-supporting portion of the shoe. In the McKay-sewed shoe the arched shape of the arch-supporting portion 4 is preserved partly by the reinforcing layer 53 and partly by the outsole.

In both embodiments of my invention the arch-supporting portion is formed by deforming the insole and not by the introduction of a pad or other element beneath the insole. The strength of the arch-supporting portion 4 is due to the strength of the insole and the way it is incorporated into the shoe.

While I have illustrated some selected embodiments of the invention I do not wish to be limited to the constructional features shown.

I claim:

1. A shoe having an insole forming a permanent part thereof and shaped to present an arched arch-supporting portion, the edges of said insole on either side of the arch-supporting portion being permanently secured

to a part of the shoe which spans the concave face of said arch-supporting portion, said face being unsupported.

2. A shoe having an insole forming a permanent part thereof and shaped to present an arched arch-supporting portion, the edges of said insole on either side of the arch-supporting portions being permanently secured to a part of the shoe which spans the concave face of said arch-supporting portion, said face being unsupported, and said part of the shoe by its permanent attachment to the insole serving to hold the arch-supporting portion in its arched shape.

3. The steps in the method of making a shoe which consists in molding an insole to produce in the latter a concavo-convex arch-supporting portion, incorporating the insole in a shoe as a permanent part thereof and in so doing securing the edges of the insole at either side of the arch-supporting portion to a part of the shoe that spans the concave face of the arch-supporting portion and leaving said face unsupported, whereby the arch-supporting portion is free to give as pressure is applied thereto.

4. The method of making an insole for a shoe having an arch-supporting portion which consists in molding an insole blank to produce therein a concavo-convex arch-supporting portion, superposing said blank on an insole pattern which has a recess to receive the arch-supporting portion and then trimming the insole blank to the shape of the pattern.

5. A shoe having an insole forming a permanent part thereof and shaped to present an arched arch-supporting portion, a reinforcing layer of fabric cemented to the under face of the insole and spanning the concave face of the arch-supporting portion, said face being unsupported.

6. The steps in the method of making a shoe which consists in molding an insole to produce in the latter a concavo-convex arch-supporting portion, cementing to the under face of the insole a fabric layer which spans the concave face of said arch-supporting portion, and incorporating the insole in a shoe as a permanent part thereof.

In testimony whereof, I have signed my name to this specification.

JOHN WALTER MAY.