Dec. 28, 1948. W. M. SCHOLL 2,457,737

METHOD OF AND MEANS FOR MAKING ARCH SUPPORTS

Filed June 12, 1944

Fig-1

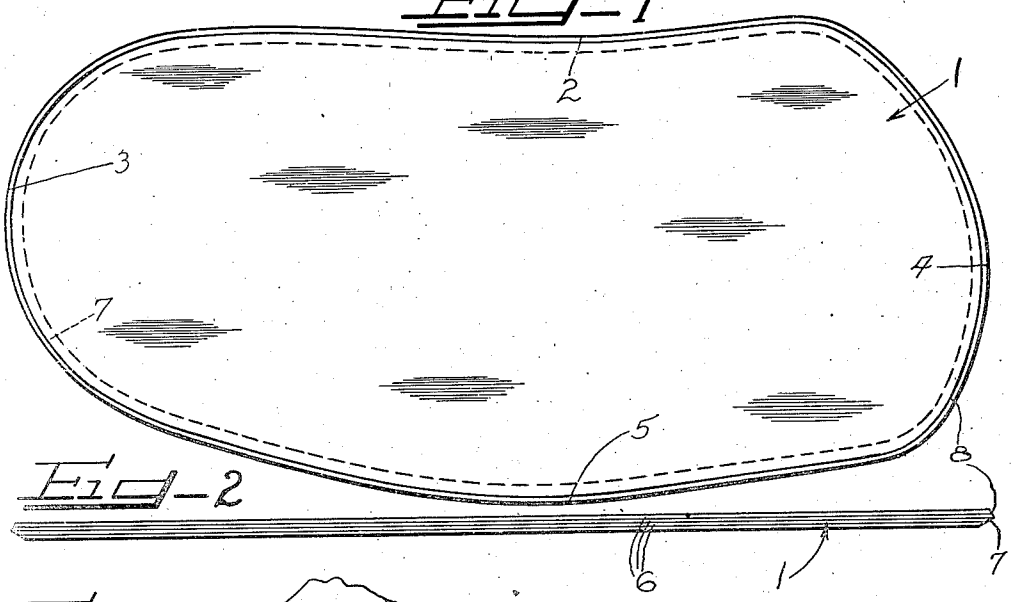


Fig-2

Fig-4

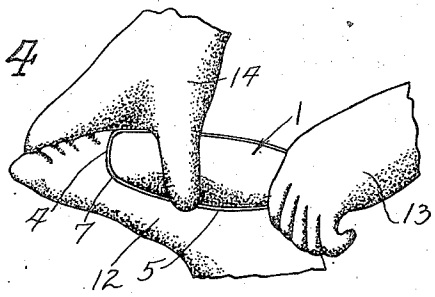


Fig-3

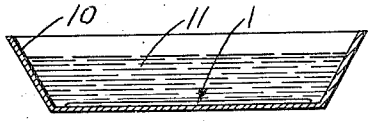


Fig-5

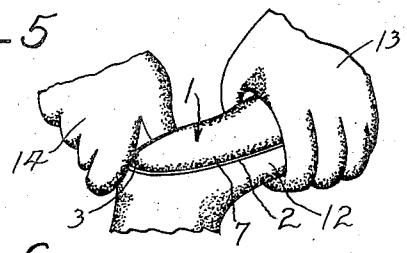


Fig-7

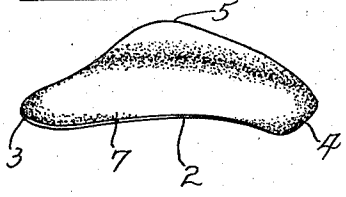
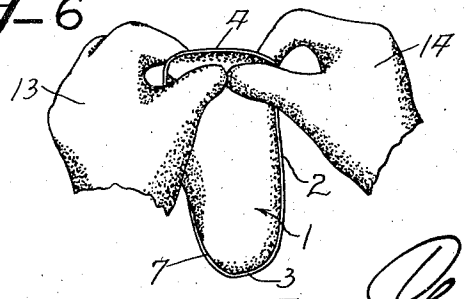


Fig-6



INVENTOR
William M. Scholl

By Charles R. Hill Attys

Patented Dec. 28, 1948 2,457,737

UNITED STATES PATENT OFFICE

2,457,737

METHOD OF AND MEANS FOR MAKING ARCH SUPPORTS

William M. Scholl, Chicago, Ill.

Application June 12, 1944, Serial No. 539,964

6 Claims. (Cl. 36—71)

1

This invention relates to improvements in a method of and means for making an arch support, and more particularly, an arch support of moldable material for disposition within an article of footwear, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

While frequently for various foot ailments it is possible to purchase a foot correction appliance that satisfactorily fits the foot in the needed location or which may be made to satisfactorily fit the foot by way of a minor adjustment, it many times happens that a device is required that intimately and accurately fits the afflicted part of a particular foot, and such device can only satisfactorily be acquired by way of making the device to fit that particular foot. In the past, difficulty has been experienced in making foot correction appliances to order for particular feet, especially when those correction appliances were in the form of arch supports embodying a relatively large metallic plate. It was an extremely difficult proposition for a chiropodist or other foot specialist to reshape an arch support into the required configuration by means of a hand press or other implement in his own office. However, it is desirable for a chiropodist in providing a made-to-order foot correction appliance to be able to do the major work in connection with the forming of that appliance so as to be sure and acquire the precise fit he has deemed necessary for a particular patient.

The present invention seeks to overcome the above mentioned difficulties in the provision of means from which an arch support or other foot correction appliance may be made by a chiropodist in his own office and provide substantially any configuration the chiropodist desires.

Another object of the instant invention is the provision of means for making a foot correction appliance, said means being in the nature of a substantially flat piece of plastic material having an edge configuration generally in keeping with the resultant configuration of the foot correction appliance molded from a piece of plastic material.

Also an object of this invention is the provision of means which may be shaped into a foot correction appliance, said means comprising a piece of plastic material having a relatively wide bevel around the edge portion thereof to facilitate the shaping of the piece into a desired configuration in keeping with the portion of the foot the correction appliance is in contact.

It is a further object of the instant invention

2

to provide a substantially flat piece of plastic material having an edge configuration to facilitate shaping the piece of material into an arch support to intimately fit the portion of the plantar surface of the human foot, such edge configuration being either for a left or right foot as the case may be.

Still a further object of the instant invention is the provision of a new and novel method of making a foot correction appliance.

It is also a feature of this invention to provide a new and novel method of making a foot correction appliance especially adapted to fit a particular and individual foot, and which method may be practiced and the appliance actually made by a chiropodist or other foot specialist in his office, without resort to machinery, apparatus, or mechanism commonly found in a manufacturing plant.

A still further feature of the invention is the provision of means for and a method of making an arch support or other foot correction appliance by hand.

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 drawing, in which:

Figure 1 is a plan view of a piece of material embodying the principles of the instant invention, and from which a foot correction appliance may readily be made by a method also embodying the principles of the instant invention;

Figure 2 is a side elevational view of the structure of Figure 1;

Figure 3 is a vertical sectional view, with parts in elevation, illustrating diagrammatically a first step in the process of shaping the piece of material of Figures 1 and 2 into a foot correction appliance;

Figure 4 is a fragmentary diagrammatic view illustrating a further step in the process of making a foot correction appliance;

Figure 5 is a fragmentary diagrammatic view illustrating the next step in the making of the foot correction appliance;

Figure 6 is a fragmentary diagrammatic view illustrating a still further step in the making of the appliance; and

Figure 7 is a perspective view of a finished foot correction appliance.

As shown on the drawings:

With reference more particularly to Figures 1 and 2, it will be seen that the means from which

the foot correction appliance is made, embodies a substantially flat piece 1 of plastic material. In the illustrated instance, the piece 1 is shaped for forming an arch support for disposition beneath the plantar surface of a left foot. The piece has an outlined configuration generally in keeping with the correction device that is to be made from it. For an arch support, the piece will have a concave arcuate portion 2 along one side which will ultimately be adjacent the outer longitudinal arch of the foot, a rounded curvate edge portion 3 in the heel part of the piece, a curvate portion of greater radius as indicated at 4 at the anterior end of the device, and an outwardly bulged or convex arcuate portion 5 for ultimate disposition adjacent the inner or major longitudinal arch of the foot.

The plastic piece 1 preferably includes a plurality of laminations of plastic and fabric. A satisfactory substance, by way of example, is laminations of fabric and cellulose nitrate sheet stock secured together into an integral whole. The fabric may be of the character of gauze, linen, or equivalently suitable cloth. A satisfactory commercial product may be made with five such laminations, that is, three of the cellulose nitrate sheet, and two of the fabric, with the cellulose nitrate sheet, of course, forming each of the outside faces.

With reference more particularly to Figure 1, it will be noted that a relatively wide bevel 7 is provided entirely around the piece 1, while on the opposite side a narrow and more abrupt bevel 8 which is preferably sufficient to provide a smooth edge is made. As will more fully appear later herein, the relatively wide bevel 7 permits the plastic piece 1 to be molded into the desired shape and retain a smooth edge portion of desirable thinness.

The plastic piece 1 is sold or otherwise distributed to chiropodists or other foot specialists in its substantially flat condition. Of course, there will be such pieces or plates for left and right feet. The chiropodist or foot specialist makes a foot correction appliance from such a product after determining the particular shape of appliance needed by an individual customer. From the piece 1 the chiropodist would make an arch support for disposition within an article of footwear for a left foot.

In so making such an arch support, the chiropodist would first make a plaster cast of the particular foot in question. Such a cast should be a good positive cast free from wrinkles, rough or high spots. If there should be any air bubbles or other openings in the cast, they should be closed with plaster of Paris so that the molding surface is as smooth as feasible. After the cast has been dried, the chiropodist may then make the desired corrections in the cast with a shoemaker's rasp, a knife, or some equivalent tool. That is, if the chiropodist does not desire that the resultant arch support intimately fit the foot of the particular patient as the foot then is, he may correct the shaping of the plaster cast to provide additional elevation, pressure, or support, and to such an extent and in such a location as he may deem meet.

It is preferable that the chiropodist don a pair of cotton or buck skin gloves just before the molding of the piece 1 into an arch support. These gloves should be kept on all during the molding operation, and if gloves are not convenient, a soft towel may be used for smoothing and fitting the heated piece or blank 1 during

the molding operation. To make the blank or piece 1 pliable sufficiently for shaping purposes, it should be placed in boiling water approximately five minutes. This step is illustrated in Figure 3, showing the piece 1 lying in a vessel 10 of any suitable character and containing a liquid 11 such as water which may be heated to the boiling point.

After the softening bath, the blank may be removed with a pair of forceps and placed upon a plaster cast 12 for a particular foot. In placing the piece 1 upon the cast 12, the wide bevel 7 should be uppermost or facing the worker, with the cast in inverted position as seen in Figures 4 and 5. Thus, the wide bevel 7 will ultimately be disposed on the side of the support opposite the foot or the shoe side of the arch support.

Preferably, one-half of the blank or piece 1 is molded over the plaster cast at a time. First, the blank may be held to the cast at the heel portion by one hand 13 of the operator and with the thumb or thumb and fingers of the other hand 14 of the operator, the anterior end of the resultant arch support is formed by shaping the piece 1 intimately against the plaster cast.

Then, the posterior part of the partially shaped blank may be placed in boiling water for approximately fifteen minutes, or the temperature sufficient to soften the blank may be applied in some other suitable manner, and then the blank may again be applied to the cast. This time, the forward or anterior end of the blank will be held down by one hand of the operator as indicated in Figure 5, and the longitudinal arch portion of the resultant support as well as the heel may be shaped over the plaster cast with the other hand.

To make a metatarsal elevation in the shaped blank, the front end of the blank may be heat treated to a depth of about two inches, and then with both thumbs the underside of the blank may be pressed as shown in Figure 6 to the desired corrective elevation.

After the blank has been molded into the resultant arch support, any finishing or cutting down can be done with a grinder burr or other suitable tool, after which acetone may be applied to make a finished smooth edge.

It will be noted, as illustrated, that the blank is cupped over the plantar region of the plaster cast so that all the way around, with the exception of the anterior margin, the marginal portion of the blank is turned upwardly in varying degrees of height. Thus, when the arch support is finished, the foot rests in the support and the support forms substantially a socket for the underside of the foot. Of course, the bulge 5 on the blank going to make up the supporting portion for the major longitudinal arch of the foot will extend above all the other parts of the blank, as seen in Figure 7. In this Figure 7, I have shown a support made in the manner above described, but in the instance of Figure 7, I have illustrated a support for disposition beneath a right foot, as indicative of the fact that arch supports for both feet are made in substantially the same way, and the blanks are initially alike except for left and right characteristics. The forward or anterior edge 4 of the resultant support is, of course, left substantially flat or even slightly downwardly turned so as to insure a good seating of the support in an article of footwear.

It will be noted that the wide bevel 7 will be upturned except at the anterior end of the support, and thus the thickness of the upturned margin is reduced to enable the device to be seated

more comfortably within an article of footwear. This same bevel across the forward or anterior end of the support provides a non-gouging front rest for the support within a shoe or other article of footwear.

It will be appreciated that while I have illustrated means for and a method of making an arch support, other foot corrective appliances may also be made by means and under the principles of the method involved in this invention.

From the foregoing, it is apparent that I have provided simple means and simply practiced method for making a foot corrective appliance, both the means and method lending themselves to the making of the appliance by a chiropodist or other foot specialist at his own office so that the resultant appliance will properly fit a particular individual foot.

It will be noted that the means and method require the use of only the most simple tools and equipment, and do not require any special equipment of the character that might logically be found only in a manufacturing plant. It will further be noted that the means as well as the practice of the method are economical and the resultant support or corrective appliance is highly durable, as well as comfortable and well fitting both to the individual patient as well as within an article of footwear.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. As an article of manufacture, a single piece blank to be shaped into an arch support, said blank comprising a substantially flat thermoplastic piece having an outline contour generally in keeping with that of an arch support, and said blank also having a relatively wide marginal bevel on the outer side thereof and a relatively narrow and more abrupt marginal bevel on the inner side thereof to provide a smooth edge and to facilitate shaping and provide a better fit of the resultant support in an article of footwear.

2. The method of making a foot corrective appliance from a preformed single piece blank of plastic material having a margin with a substantial bevel, including the steps of making a positive cast of a particular foot, heating the blank to soften the same, and shaping the softened blank over the cast with said bevel on the side of said blank away from the cast.

3. The method of making an arch support from a preformed thermoplastic blank, including the steps of making a cast of desired shape for a particular foot, heating said blank to soften the same, shaping a part of the softened blank intimately over said cast while holding the other part of the blank against the cast, reheating the unshaped part of the blank, and then shaping the unshaped portion of the blank over the cast.

4. The method of making an arch support from a preformed thermoplastic blank, including the steps of making a cast of desired shape for a particular foot, heating said blank to soften the same, shaping a part of the softened blank intimately over said cast while holding the other part of the blank against the cast, reheating the unshaped part of the blank, and then shaping the unshaped portion of the blank over the cast, heating the anterior portion only of the shaped blank, and shaping a metatarsal lift therein.

5. The method of claim 3 further characterized by the steps of initially beveling the margin of the blank and by the shaping of the blank so that said beveled margin is on the side of the blank away from the cast.

6. The method of claim 4 further characterized by initially beveling the margin of the preformed blank so that the edge has a double bevel, one of which bevels is slight and the other substantial, and both of which bevels terminate in a common relatively sharp edge, and in the shaping of the blank to the cast, keeping the substantial bevel on the side of the blank remote from the cast.

WILLIAM M. SCHOLL.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
865,836	Wedekind	Sept. 10, 1907
1,044,171	Guilford	Nov. 12, 1912
1,113,380	Stephenson	Oct. 13, 1914
1,914,049	Smith	June 13, 1933
2,313,870	Golden	Mar. 16, 1943

FOREIGN PATENTS

Number	Country	Date
255,415	Great Britain	Mar. 17, 1927