United States Patent [19]

Wesberg

[11] **3,929,140**

[45] **Dec. 30, 1975**

[54] **COMBINED HEEL POSITIONER AND ARCH SUPPORT FOR THE FOOT**

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[22] Filed: **Sept. 16, 1974**

[21] Appl. No.: **506,392**

[52] **U.S. Cl.** **128/595;** 128/586

[51] **Int. Cl.²** **A61F 5/14**

[58] **Field of Search** 128/595, 581, 586, 594, 128/607, 614; 36/28, 29, 30, 44

[56] **References Cited**

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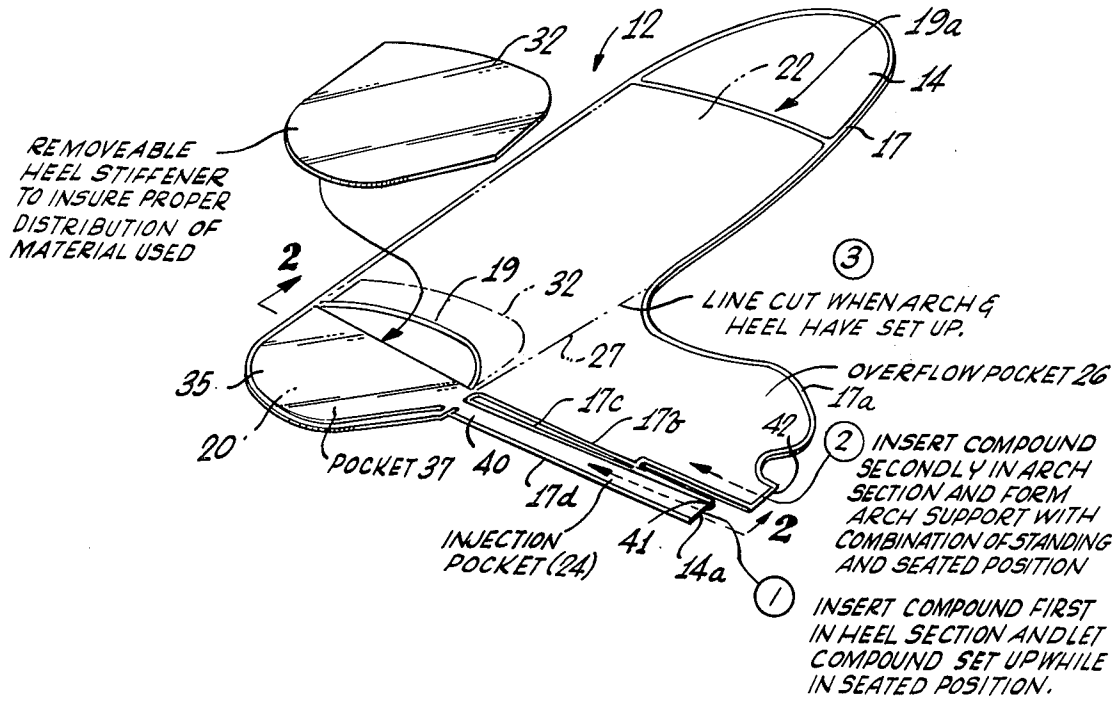
3,121,430	2/1964	O'Reilly	128/595

Primary Examiner—Richard A. Gaudet
Assistant Examiner—J. Yasko
Attorney, Agent, or Firm—I. Morley Drucker

[57] **ABSTRACT**

The disclosure relates to a heel positioner and arch support and method of making the same, in which the positioning support for the heel is made in situ, in one discrete section of the foot support, and the arch support is then made, in situ, in a second discrete section.

13 Claims, 4 Drawing Figures



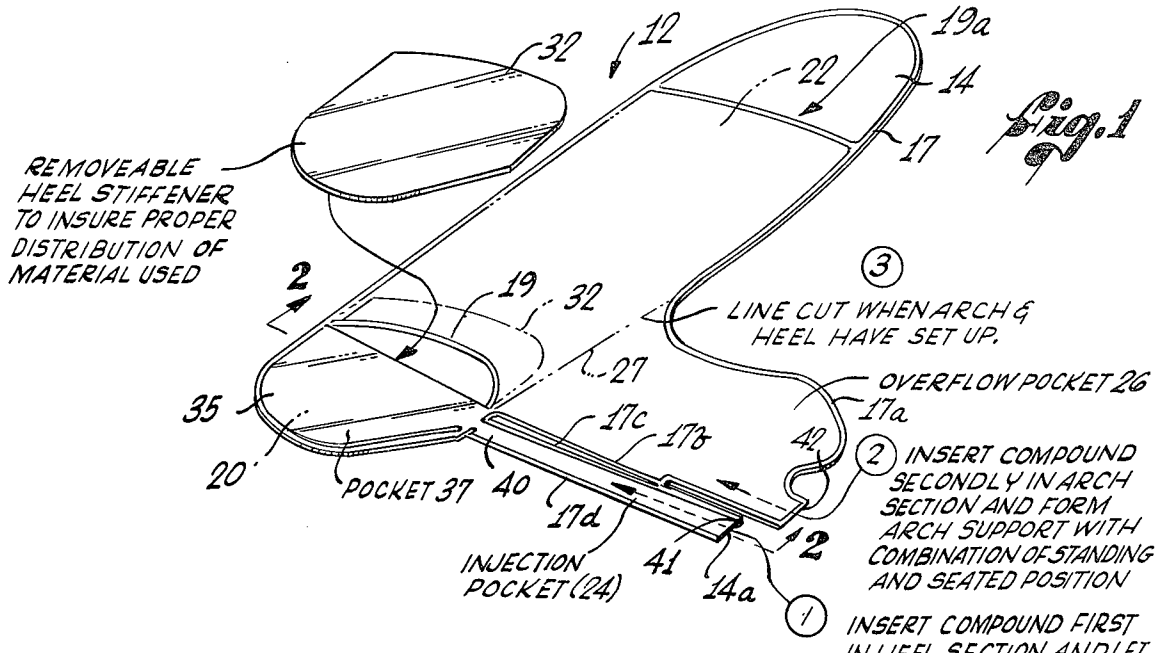


Fig. 1

Fig. 2

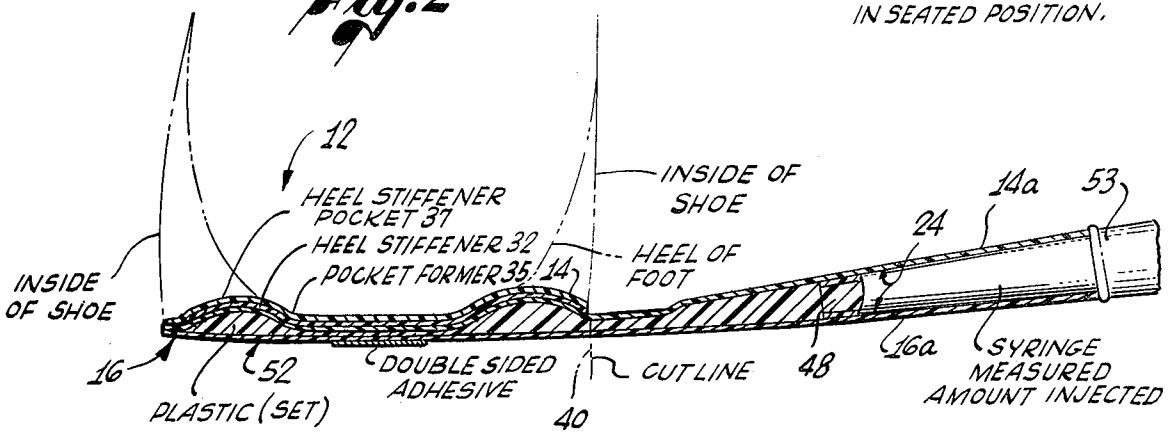


Fig. 3

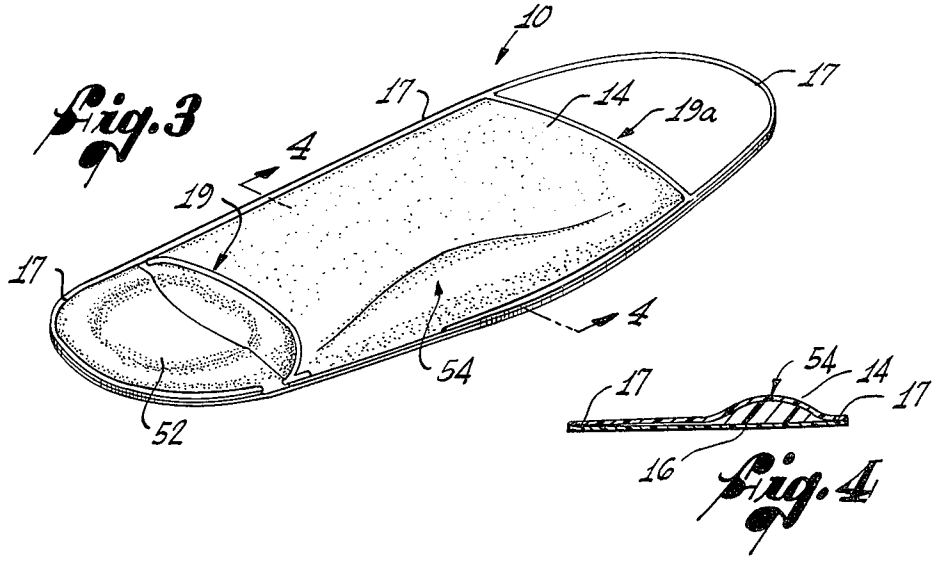


Fig. 4

COMBINED HEEL POSITIONER AND ARCH SUPPORT FOR THE FOOT

The first discrete section is made at the heel portion of the foot, in a manner so as to stabilize the plantar surface of the heel section of the foot under the cancaneous bone. This is for the purpose of eliminating, reducing or minimizing the rotation forces applied to the heel section of the foot by the weight of the body, which would normally tend to produce a pes valgus (outward bending) or a pes varus (inward bending) condition, as well as stabilizing the anterior - posterior position of the leg in its function of bearing body weight.

Once the heel stabilizer section has been formed, in situ, a discrete arch support section is then provided, in situ, for the arch portions of the foot so that the body weight will not tend to place strain upon the inner structures of the foot (bone joints, tendons, muscles, and related tissues), in the arch sections which connect the heel to the second part of the foot that support the body weight (i.e., the ball of the foot).

INTRODUCTION

The necessity for an arch support is well covered in the literature. To quote from "Orthopedic Appliances, by Henry H. Jordan, Oxford University Press 1939", an arch support is used "to effect a correct, painless distribution of the weight to establish as far as possible the correct position of the elements of the foot in relation to the line of gravity of the leg".

Many individuals believe that an arch support should be formed in the shoe that it is to be worn with, so as to match simultaneously both the plantar surface of the foot and the inner sole of the shoe. The major purpose of my invention incorporates improved methods and means over those previously proposed and used, to effect a proper balanced foot support for those individuals that need and desire to use one. The invention is directed to a method and means of effecting proper distribution of body weight upon the plantar surface of the foot, with minimal strain, stress and distortion to the inner structures of the foot.

It is well documented in medical literature that proper positioning and support of the feet leads in turn to the correct positioning of the legs, knees, thigh, and back of the individual with resulting greater comfort in these areas.

Theoretically, in a normal standing position, the weight born by a foot is divided approximately between the heel and the ball of the foot. However, the heel bone of the foot is in a more direct line with the skeleton of the leg, and thus bears most of the actual total weight, with the ball of the foot and the connecting arch structures serving mainly a balancing function.

The stability and position of that part of the foot under the heel bone is most important in controlling the supination and pronation positions of the foot, as well as anterior - posterior stabilization of the leg. The ability to prevent involuntary supination or pronation and to provide proper anterior - posterior stabilization leads to a more vertical position of the leg and thus to a more normal position of the body as a whole.

Heel wedges, orthopedic heels, and other methods are generally used to position the heel bone and obtain proper support in the heel area. However, these methods are inaccurate. A method and means which permits an in situ heel positioning is believed to be much more accurate.

It is known, that in order to construct an arch support within a shoe, with the foot in the shoe, a hydraulic system may be used. By this, it is meant that an initially flowable material enclosed within a chamber is placed under the plantar surface with the foot in the shoe in order to flow under pressure and distribute itself in a pattern that is determined by the contour and pressures of the plantar surface against this material. The initially flowable material then sets or cures to the desired configuration required to support the plantar surface in an optimum manner.

Experiments with an insole device comprising a single chamber for acceptance of a settable fluid system showed that due to the great amount of weight under the heel bone little or no material remained in this critical heel area when the proper and sufficient amount of material was obtained in the arch section of the foot. This type of approach is perhaps best exemplified by O'Reilly, U.S. Pat. No. 3,121,430.

Consequently, the single chamber approach of O'-Reilly did not prove to be satisfactory. With this in mind, it was a major object of this invention to provide proper balance and support of the foot by first properly positioning and comfortably supporting the heel portion of the foot by a first discrete heel support section, formed in situ, and then forming, in situ, a second discrete section for support of the arch portion of the foot.

SUMMARY OF THE INVENTION

This invention is specifically directed to the formation of a dual chamber insole, in situ, the dual chambers comprising, in general terms, a discrete heel positioning support chamber and a discrete arch support chamber.

Inlets for the introduction of room temperature settable fluids, e.g., silicones, into each of the chambers is provided. Room temperature settable fluids are designated in the trade as room temperature vulcanizing (RTV) compounds. In situ molding to the heel and arch of the wearer are made as follows. The heel positioner and support is formed, in situ, by injecting RTV fluids into the discrete heel positioner section. While the insole support envelope is in place between the foot of the user and the inner surface of the shoe, the user remains in seated position, with his body weight off the foot, while the positioner and support is being formed. In this way, the heel positioner and support may be properly formed without undue displacement of settable material.

After curing of the settable material in the heel section, the second support chamber is injected with a measured amount of the same settable plastic fluid. While the user is in standing position with his weight on the envelope the fluid on setting will conform to the plantar surface of the wearer, the conformity, however, being of an optimal nature, however, due to the proper positioning of the heel by the heel support section.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view, in perspective, of the insole support envelope of my invention, showing the various chambers therein. The insole envelope is shown prior to the introduction therein of settable fluids for foot support purposes and prior to its insertion into the left shoe of a user;

FIG. 2 is a cross-sectional view of the insert envelope of FIG. 1, taken along line 2—2 at a time after introduction of RTV fluid into the heel support section of my insert support envelope;

FIG. 3 is a perspective view of the finished insole support of my invention; and

FIG. 4 is a cross-sectional view of insole support taken along the line 4—4 of FIG. 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The insole support of my invention, shown in FIG. 3 and designated by the numeral **10** is made, in general, by injecting RTV fluids into dual chambers formed in an insert support envelope, the insole support envelope for the left foot being shown in FIG. **1.**

The insert support envelope of FIG. **1** is designated generally by the numeral **12.** The envelope **12** is provided with an upper panel or layer of a preferably fabric-lined plastic sheeting **14,** the fabric lining (not shown) being internally mounted to the sheeting **14.** The sheeting **14** may comprise, by way of example, a fabric backed (or lined) vinyl or a fabric backed polyurethane of suitable thickness and flexibility, the purpose of the fabric lining being to provide a mechanical bond between the fabric of sheeting **14** and the curved RTV plastic.

The bottom panel or layer **16** of the insert support envelope **12** comprises a preferably transparent, plastic sheet of flexible polyvinyl chloride or polyurethane, that is readily welded to upper panel **14** along peripheral weld lines **17** and internal weld lines **19, 19***a*. The internal and peripheral weld lines **17, 19, 19***a* form a heel positioner and support chamber **20** and an arch support chamber **22,** respectively.

An injection pocket **24** is also provided in communication with heel support chamber **20,** through neck **40,** the injection pocket **24** being preferably formed of a pair of superposed layers **16***a* and **14***a* which are merely medial continuations of layers **16** and **14,** respectively.

An overflow pocket **26** is provided which communicates only with arch support chamber **22,** through an opening coinciding with the dotted line **27.** The overflow pocket **26** and its inlet port **42** are preferably formed as part of insert support envelope **12,** and the upper and lower panels or layers constituting the overflow pocket **26** and inlet port **42,** are thus medial continuations of the upper and lower layers **14** and **16,** respectively.

The welding of upper and lower sheets or panels, **14, 16** is readily performed by conventional dielectric sealing means. The lower panel **16** forming the insert support envelope is approximately 10–15 mils in thickness and it is also presently preferred that the inner surface thereof have a textured configuration. The textured surface aids the flow characteristics of the presently preferred settable fluid, (which is a room temperature vulcanizing (RTV) silicone) during formation of the insert support, and also will impart a textured finish to the cured silicone layer of the finished product — which will aid in maintaining this insert support in place when worn in the shoe.

The top layer **14** of the insert support envelope **12** is preferably provided with a removable heel stiffener **32.** The heel stiffener **32** comprises a fairly rigid plastic piece, e.g., made of polyvinyl acetate of about a 20 mil thickness. The heel stiffener **32** is positioned over the heel support chamber **20** by means of a stiffener pocket **37.** The pocket **37** is formed simply by dielectric welding a flexible vinyl sheet **35** of perhaps 10–12 mils in thickness along the periphery of the heel support chamber **20** only. The stiffener **32** extends forwardly of the stiffener pocket **37** so formed. The detailed purpose of the heel stiffener **32** will be later described.

The periphery of the insert support **10,** formed by weld line **17,** is such as to preferably form a finished insert support which approximates the innersole area of the shoe to be fitted.

The peripheral welds along lines **17***d*, **17***c*, **17***a* and **17***b* form a flexible injection port **41** to chamber **20,** a flexible overflow pocket **26** and a flexible injection port **42** to chamber **22,** respectively. The heel positioner chamber **20** is formed by weld line **19** which line runs approximately below the line of insertion of the spring and long plantar ligaments into the calcaneous (heel) bone. The arch support chamber **22** is formed by weld line **19** and by anterior weld line **19***a* which is in the ball area of the plantar surface.

The injection pocket **24** (and its entrance port **41** and neck **40**) together with overflow pocket **26** (and its entrance port **42**) are sometimes referred to generally hereinafter, and in the claims, as first and second flexible conduit means extending medially with respect to the heel support and arch support chambers, respectively. These first and second conduit means each preferably have a length in excess of the height of the shoe measured from the insole to the upper edge of the shoe in order to avoid any overflow of material into the wearer's shoe.

The upper and lower layers **14, 16** of envelope **12** preferably extend anteriorly of weld line **19***a*, in order to cover the full inner sole of the shoe — as an additional means of maintaining the insole support **10** of this invention in place. It is not a requirement, however, and the support insert **10** could terminate anteriorly along line **19***a*.

The envelope **12** may be cut between weld lines **17***b* and **17***c* to facilitate independent manipulation of the entry ports **41** and **42** to chambers **20, 22.**

The neck **40** of the injection pocket **24** is proportioned so that the nozzle **48** of an injection syringe **53** can be tightly wedged into the neck **40** while injecting the settable plastic mix into the heel support chambers **20.** The neck **40** of the heel chamber **20** thus preferably narrows to a diameter of not more than one-half inch. The purpose of this "necking down" is to minimize the escape of any RTV fluid material from the heel chamber **20** during the formation and setting of the heel support section.

The amount of RTV settable fluid injected into the heel chamber **20** is based on a numerical formula relating volume to heel chamber area to be later set forth herein. Further, during the actual setting of the material in the heel chamber **20,** the injection pocket **24** is turned up inside the shoe of the wearer, and material overflow through neck **40,** is greatly inhibited. Moreover, the heel stiffener **32** prevents outflow of material through the neck **40** by offering a barrier or dam to any overflow through neck **40.**

The overflow pocket **26,** in contrast, communicates with arch support chamber **22,** by means of a very wide neck indicated, generally, by dotted line **27.** Excess RTV fluid can thus readily escape from chamber **22** during the molding operation of the arch support.

Both chambers **20, 22** together with their respective flexible conduit means, are open systems for the pur-

pose of placing the RTV fluid into these chambers, and at the same time, allowing any air trapped in the chambers **20, 22** to be expelled. In this connection, it is found advantageous to manipulate the RTV plastic fluid once it has been placed into the chambers **20, 22** in such a manner as to collect the trapped air and to expel this air out of the chambers **20, 22** through the ports **40, 41, 42.**

MATERIALS EMPLOYED

The preferred room temperature settable material at this time is one of a series of silicone rubber compounds manufactured by General Electric Company, Silicone Products Department, Waterford, N.Y. 12188.

These room temperature vulcanizing (RTV) silicones are preferably two-part compounds, such as General Electric's RTV-1041 (wherein the preferred curing agent is General Electric's CS 4097C or CS-4096C). Other successfully employed compounds include General Electric's RTV 11 and RTV 1012. Other materials of choice are found in GE's Technical Data Book S-35 and Product Data on Silicone Dental Moldings and Formulating Compounds (Bulletin No. CDS-316).

The use of a silicone rubber has the following major advantages:

1. it is physiologically inert;
2. after mixing and setting, it has very poor adhesive qualities, especially to plastics, leather and skin. This makes clean up of excess and spilled material very easy.
3. it is easy to repair or add to the cured material. A new mix will bond to an old one.
4. Mechanical bonding is simple and strong. This is the reason for the fabric backing to the upper layer of the envelope.

Other materials, such as a two part polyurethane base and catalyst system may also be used but at the present state of the art, it is a more sensitive and difficult material to use than the silicone materials.

PROCEDURE

1. Place a strip of two sided adhesive tape **40** on inner side of each shoe to hold the insert support envelope **12** in place during the setting period.

2. Place the plastic stiffener **32** into pocket former **37** of each insert support envelope **12.**

3. Dispense a predetermined amount of a settable fluid such as an RTV silicone rubber base compound into a large syringe (a sufficient quantity being that required for two heel chambers **20**). The amount to be dispensed into each chamber should be approximately one-half cc per sq. cm of the finished heel chamber **20.** However, this amount is somewhat variable and will depend upon the configuration of the insole of the shoe being fitted and the amount of heel positioning correction that may be desired.

4. Fill a small calibrated syringe (not shown) with a desired curing agent in a ratio of about one-tenth amount of the silicone compound placed in large syringe.

5. Inject the contents of small syringe into the large syringe **53.**

6. Mix thoroughly with a spatula (not shown) for approximately 1 minute. Thorough mixing is important to obtain a proper set.

7. Screw a plastic nozzle **48** onto the syringe **53** and while holding syringe with the nozzle up, expel trapped air from syringe and nozzle.

8. Insert the nozzle **48** into the injection pocket **24** of the heel support chamber **20** and expel the predetermined amount of mix into chamber **20,** as measured by the calibrations on the syringe **53.**

9. Repeat Step 8 to fill the heel support chamber (**20**) for the other insert support envelope.

10. For each insert support envelope **12,** all of the material is manually forced away from the neck **40.** This will result in trapped air being forced toward the neck **40,** and the air bubble is then forced out through the neck. The procedure is repeated 2 or 3 times, to make sure all air is removed.

11. After all air is removed, bend over the ends of each injection pocket **24** and close them off by clamping spring clips (not shown) onto the openings of the injection pockets.

12. Place the envelope **12** in their respective shoes, holding the same in proper position with the two sided adhesive strip **40.** The entrance ports **41** always face medially, that is, toward the opposite foot.

13. Place each foot in the proper shoe and lace same. This must be done in a sitting position. Total body weight should never be placed on the envelope **12** while the heel section is being formed. There is a slight danger of breaking the plastic welds **17, 19, 19*a*** and forcing the mix onto the shoe, and more importantly, there is no control over the flow of the material that is required in order to obtain the proper configuration necessary to obtain the correct heel support (position and stability).

14. The setting time of the silicone is approximately 15 minutes from the time the curing agent is incorporated into the compound. About one-half of this time (approximately 7 to 8 min.) is allowed for the above steps 5 through 13.

15. In a sitting position, the feet are placed together with the legs vertical. This position must be maintained for approximately another 7 to 10 minutes. The time can be determined by watching and testing a small quantity of the mixed material until it reaches a tack-free consistency.

16. The position of the feet together and the legs vertical (the leg being that portion of the anatomy between the knees and ankles) is the position to be used for an individual that does not require any major correction of the foot position. If there is a need to add correction to the pattern of the compound, it can be done by positioning the leg and foot (keeping the sole of the shoe flat upon the floor) in a position that is opposite to the condition for which correction is desired. Thus, for example, if a pronated foot, or pes valgus, exists and a correction is desired then the leg and foot should be placed so that a position of supination, or pes varus, is maintained during the setting period of the settable fluid, e.g., the silicon mix. Corrections such as this and others that may be required should generally be prescribed by an orthopedic physician or a podiatrist.

17. When the sample of the mix shows that it has set the shoes are removed, and the envelopes **12** taken out.

18. The heel stiffeners **32** are then removed. The purpose of the heel stiffener **32** is to prevent undue displacement of soft tissue areas of the heel, particularly on the peripheries thereof, and especially on the mesialanterior corner of the heel area, by the hydraulic

pressures exerted by the silicone material itself. The stiffener **32**, which may be of about 20 mil in thickness, is still sufficiently flexible to allow proper distribution of the silicone material, while preventing undue build up and displacement in any particular area. The pattern of the rigid stiffener is such that it will preferably extend anterior to the border of the heel chamber **20**, again to prevent excess material from collecting in the mesial-anterior corner. It is possible, also, to eliminate the heel stiffener **32** entirely by making the heel section of layer **14** of a more rigid material while maintaining the arch support section of a more flexible nature.

19. Repeats Steps 3 through 12, and fill arch support chambers **22** of each envelope **12.** The amount of material is not critical but an excess is desired and provided for by the overflow pocket **26.** Approximately 2 to 3 times the quantity of material used in the heel chamber will be required. This will vary and depend upon the shape and type of shoe, the height of the individual's arch, and any correction that may be desired. Also, before placing the envelopes **12** into the shoe all of the fluid is forced to the lateral wall (away from the entrance port **42**). This will aid the flow characteristics of the material, and will also aid in the expulsion of any air not previously removed.

20. With the envelopes **12** properly placed in the shoes, and the feet into the shoes, they are laced and the person is placed in a normal standing position with the legs vertical and feet together (or nearly so). This position is to be maintained for about 2 to 3 minutes and should not exceed the flowability time of the mix. In this period of time the mix will flow into those areas of the arch section of the plantar surface that are not receiving support from the shoe structures and all excess material will go into the overflow chamber **26.** The foot is not flexed nor is any pressure applied, as by walking, during this period. Due to the previous correction in the heel chamber **20**, the leg will be in a more normal vertical position with little or no tendency for abnormal or improper positioning, such as pronation or supination, and thus the fluid in the arch chamber will flow in such a pattern as to support the arches (both longitudinal and transverse) in a more normal position for the given individual wearing the shoes being fitted. However, if correction is desired, the foot and leg should be positioned as outlined in Step **16.** Correction can be placed into either the heel portion or the arch portion, or both, depending on the existing foot deformity.

21. While the material is still in a flowable state, the person should sit down with the legs and feet in the same position as described in Steps 15–16. The reason for this is to allow for the relaxation of any compressed soft tissue of the plantar surface and to allow any slight modifications of the fluid pattern to compensate for this condition. The feet and legs are maintained in this position until the material is set.

22. The envelopes **12** are now removed from the shoes. The injection pocket **24** and overflow chambers **26** are cut off along the cut line **27** and along neck **40** respectively. The vinyl sheet **37** (forming the stiffener pocket) is removed, the lower layer **16** may also be removed from both heel positioning and arch support chambers **20, 22.**

The finished support insert **10** comprises the reinforced upper layer **14,** molded in two discrete parts to form a properly conforming heel positioning section **52** and a properly conforming arch support section **54.** See FIGS. **3** and **4.** Specifically, the finished insole support comprises the reinforced upper sheet **14,** a discrete heel positioner support section **52** formed of molded (in situ) plastic, e.g., silicone rubber, affixed to the upper sheet **14,** and a discrete arch support section, also formed of molded-in-place plastic (e.g., silicone rubber) and affixed to the said upper sheet. Both the heel support section and the arch support section are spacedly separated by the weld line **19,** which is essentially free of the molded plastic material. Because the weld line **19** spacedly separates the heel and arch sections, and is free of molded plastic material, it is inherent that pressure applied to one of the sections will not be transmitted to the other of the sections.

It will also be understood that the heel positioner and support section **52** could be separately formed completely independently of the arch support section **54.** In this case, the heel section **52** once formed, could be then affixed to a separate larger sheet or envelope, for the molding of the arch support section **54.** The method and means described with reference to FIGS. **1–4** are presently preferred, however.

Modifications of this invention may be made which lie within the scope of this invention, as in modifying techniques and materials. I intend, therefore, to be bound only by the claims which follow.

I claim:

1. An insert support envelope for support of a foot in a shoe, which comprises:

a discrete heel positioning and support chamber formed by at least a pair of superposed plastic sheets;

a discrete arch support chamber formed by a pair of superposed plastic sheets;

a weld line, constituted by the lamination of superposed plastic sheets, spacedly separating said discrete heel positioning support chamber from said discrete arch support chamber whereby pressure applied to said heel chamber is not transmitted to said arch chamber, and pressure applied to said arch chamber is not transmitted to said heel chamber;

a first inlet means communicating only with said heel positioning and support chamber for the purpose of injecting molding compound and allowing escape of trapped air; and

a second inlet means communicating only with said arch support chamber for the purpose of injecting molding compound and allowing escape of trapped air.

2. The insert support envelope of claim **1** wherein said first and second inlet means are flexible conduit means extending medially with respect to said heel support and arch support chambers.

3. The insert support envelope of claim **1** in which the interior of one of said plastic sheets is fabric-lined to permit mechanical bonding of the molding compound to said plastic sheet.

4. The insert support envelope of claim **2** in which the distance of the medial extension of the conduit means of said first and second inlet means is in excess of the height of a shoe measured from the insole to the upper edge of the shoe.

5. The insert support envelope of claim **2** in which said conduit means communicating with said arch support chamber constitutes an overflow pocket for excess molding compound.

6. The insert support envelope of claim 2 in which said flexible conduit means communicating with said heel support chamber is provided with a narrow inlet.

7. The insert support envelope of claim 1 wherein adhesive means is affixed to the normally underside of said envelope to hold said envelope to the insole of a shoe during the molding of the support.

8. An insert support envelope which comprises:

a pair of superposed plastic sheets, each having a generalized foot shape being marginally welded to each other and welded also along a line internally of said marginal welds to delineate a heel positioner portion and an arch support portion, said superposed plastic sheets together with said marginal welds and internal weld line forming a discrete heel positioner and support chamber and a discrete arch support chamber, said internal weld line spacedly separating said discrete heel positioner and support chamber from said discrete arch support chamber whereby pressure applied to one of said chambers is not transmitted to the other of said chambers;

a first conduit means communicating only with said heel support chamber; and

a second conduit means communicating only with said arch support chamber, said second conduit means serving as an overflow pocket for excess plastic fluid.

9. An insole support which comprises:

a plastic sheet;

a discrete heel positioner and support section formed of molded plastic and affixed to said plastic sheet; and

a discrete arch support section formed of molded plastic and affixed to said plastic sheet, immediately adjacent to said heel support section, both said heel support section and said arch support section being spacedly separated by an area of said plastic sheet itself, which area is essentially free of molded plastic material whereby pressure applied to one said section is not transmitted to the other of said section.

10. An insert support envelope for support of a foot in a shoe, which comprises:

a discrete heel positioning and support chamber formed by at least a pair of superposed plastic sheets;

a discrete arch support chamber formed by a pair of superposed plastic sheets;

a heel stiffener piece removably mounted, in overlying position, with respect to said heel support chamber of said envelope whereby to control the flow pattern of molding compound injected into said heel support chamber;

a first inlet means communicating only with said heel positioning and support chamber for the purpose of injecting molding compound and allowing escape of trapped air; and

a second inlet means communicating only with said arch support chamber for the purpose of injecting molding compound and allowing escape of trapped air.

11. An insert support envelope for support of a foot in a shoe, which comprises:

a discrete heel positioning and support chamber formed by at least a pair of superposed plastic sheets;

a discrete arch support chamber formed by a pair of superposed plastic sheets, the upper of said plastic sheets forming said heel support chamber being less flexible than the upper sheet forming said arch support chamber, whereby to control the flow pattern of fluid injected into said heel support chamber;

a first inlet means communicating only with said heel positioning and support chamber for the purpose of injecting molding compound and allowing escape of trapped air; and

a second inlet means communicating only with said arch support chamber for the purpose of injecting molding compound and allowing escape of trapped air.

12. An insert support envelope which comprises:

a pair of superposed plastic sheets, each having a generalized foot shape being marginally welded to each other and welded also along a line internally of said marginal welds to delineate a heel positioner portion and an arch support portion, said superposed plastic sheets together with said weld lines forming a discrete heel positioner and support chamber and a discrete arch support chamber;

a heel stiffener means removably mounted to said envelope in the area of said heel positioner and support chamber;

a first conduit means communicating only with said heel support chamber; and

a second conduit means communicating only with said arch support chamber, said second conduit means serving as an overflow pocket for excess plastic fluid.

13. The insole support of claim 9 wherein said plastic sheet is initially fabric-lined on the face on which said heel and arch sections are affixed.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,929,140

DATED : December 30, 1975

INVENTOR(S) : ALEX WEISBERG

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

The correct name of the inventor is

ALEX WEISBERG

and not ALEX WESBERG.

Signed and Sealed this

sixteenth Day of *March 1976*

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks