

Jan. 19, 1971

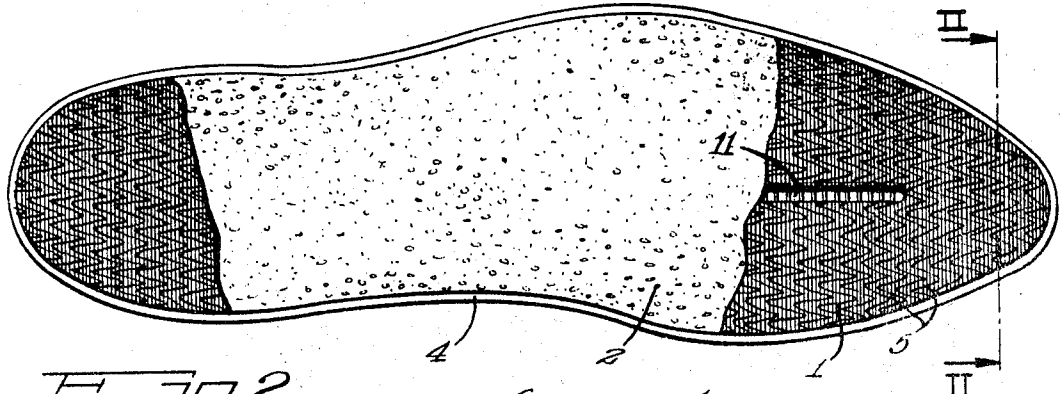
M. L. RAFFAELLI, SR

3,555,709

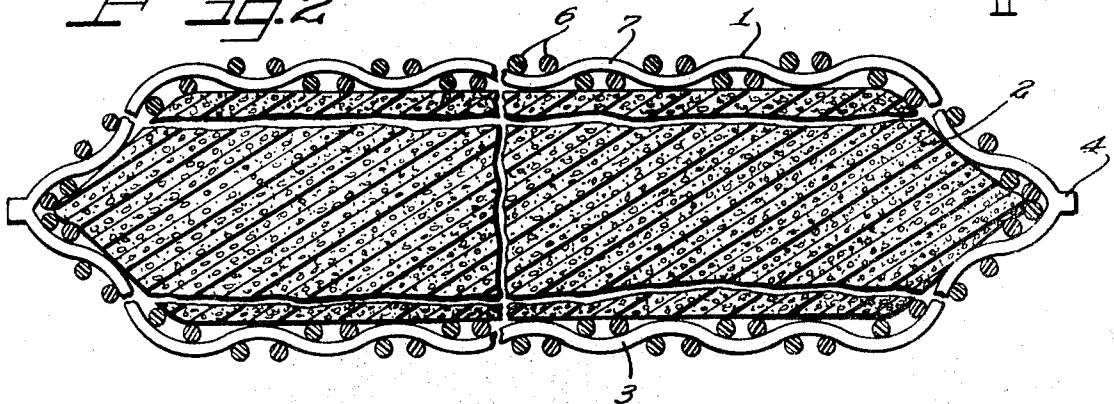
CUSHION INSOLE

Filed Feb. 25, 1969

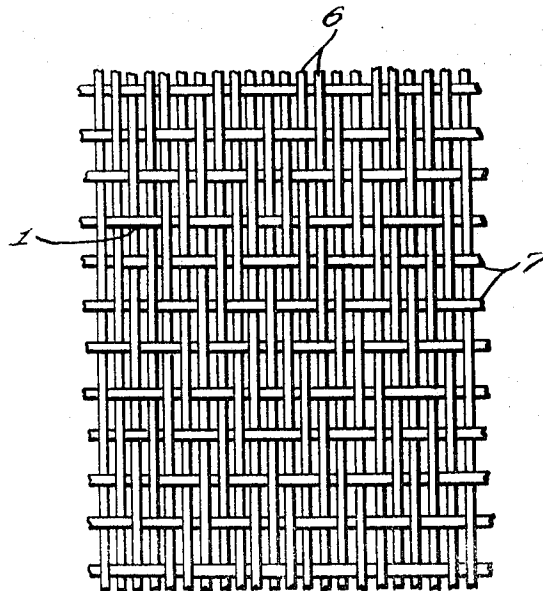
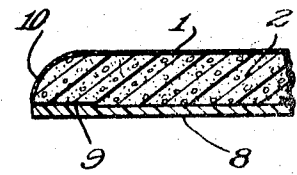
F 39.1



F 39.2



F 39.4



F 39.3

INVENTOR.

Milo L. Raffaelli, Sr.

BY *Klee, Sherman, Meoni, Cassin* ATTORNEYS

1

3,555,709

CUSHION INSOLE

Milo L. Raffaelli, Sr., Chicago, Ill., assignor to The Scholl Mfg. Co. Inc., Chicago, Ill., a corporation of New York

Filed Feb. 25, 1969, Ser. No. 801,969

Int. Cl. A43b 13/40

U.S. Cl. 36—44

1 Claim

ABSTRACT OF THE DISCLOSURE

The laminated cushion insoles made either for free disposition in an article of footwear or secured in an article of footwear during manufacture thereof as an inner sole.

BACKGROUND OF THE INVENTION

(1) Field of the invention

This invention or discovery relates to a cushion type insole laminated of thermoplastic material, the layers being secured together by electronic heat sealing.

(2) Description of the prior art

The instant invention is an improvement upon that set forth, described and claimed in William M. Scholl U.S. Letters Patent No. 3,170,250 issued February 23, 1965. The aforesaid patent discloses an insole for free disposition in an article of footwear and with such an article there is always the problem of providing a desirably smooth top surface so there will be no drag against the foot or stocking but on the contrary an easy gliding of the foot over the top surface of the insole is desired. Also, the aforesaid patent did not disclose the use of a stiffer nonthermoplastic backing on layers of an insole of that type so that the insole could be built into a shoe to function as the inner sole.

SUMMARY OF THE INVENTION

The instant invention embodies a laminated cushion-type insole, of which the upper layer is a woven fabric of thermoplastic filaments, woven in such a manner as to provide an exceedingly smooth upper surface over which a foot will easily glide and not drag thereon. The various layers are joined together by electronically heat sealing them. In one form of the invention a non-thermoplastic bottom layer is provided and with an application of a stripe of thermoplastic material compatible with the other layers, a vinyl cement being highly satisfactory for this purpose, and the top layers may then be heat sealed directly to the bottom member. With this form of the invention, the bottom member would be adhesively or otherwise secured within a shoe at the time of manufacture, and function as an inner sole. Thus, the present invention provides an insole having more advantages than that shown in the aforesaid patent.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a top plan view of an insole embodying principles of this invention, with parts broken away to reveal structure therebeneath;

FIG. 2 is a fragmentary greatly magnified vertical sectional view taken substantially as indicated by the line II—II of FIG. 1, looking in the direction of the arrows;

FIG. 3 is a greatly enlarged fragmentary plan view of the material making up the upper layer of the insole indicating its weaving; and

FIG. 4 is a vertical sectional view of the different form of the invention wherein the lower member of the insole is in itself non-thermoplastic.

2

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In that illustrated embodiment of the instant invention seen in FIGS. 1, 2 and 3, the insole comprises a top layer or sheet 1 in the form of an air pervious fabric woven relatively tightly of thermoplastic filaments. Beneath the upper layer 1 is an intermediate layer 2 of much greater thickness than the layer 1 and formed of cushioning material, preferably thermoplastic. A bottom layer 3 is also provided and this may well be an open weave fabric of thermoplastic filaments. The layers are all joined together around the bonding margin of the device by a heat seal seam 4 which fuses together at least the upper and bottom layers, and the edge of the cushion layer as well if the same is thermoplastic material.

The strands or filaments of which the top and bottom sheets are woven are capable of being commercially heat sealed together by the electronic process. A number of materials are suitable for this purpose, and by way of example it may be stated that satisfactory results have been obtained by the use of a copolymer vinyl ester, vinyladine chloride, polystyrene, and others, certain of which are mentioned in U.S. Letters Patents Nos. 2,160,931 and 2,495,045. The cushioning layer 2 may satisfactorily be a chemical foam such as a synthetic resin foam of the class including vinyl chloride foams, polyester foams, polyurethane foams and others which are satisfactory. The foam layer preferably has intercommunicating cells, whereby the entire insole is ventilative since air readily passes through the top and bottom layers.

In order to acquire the desired smoothness of the top layer so that a foot may easily be placed into an article of footwear on top of the insole without pushing the insole toward the toe end of the shoe, the fabric is rather tightly woven in a twill weave, whereby somewhat of a herringbone pattern indicated at 5 results. With reference to FIG. 3, an exaggerated showing, it will be seen that the warp strands 6 preferably pass over two weft strands 7 then under two weft strands and proceed in that manner, but adjacent strands have their crossover points in staggered relationship. The weft strands 7 vary in the number of warp strands 6 they cross over or pass under. This arrangement provides the herringbone effect. The close battening of the strands not only provides the desired slickness of surface, but also makes a very durable top layer for the insole.

The bottom layer 3 is preferably a plain woven fabric, open meshed, with the appearance of a window screen. This material has far less of a slick smooth surface than the upper layer, and is desirable so that it will better grip the inner sole of the shoe, thereby adding to the stable positioning of the insole.

In FIG. 4 I have illustrated how an insole may be made for permanent attachment within a shoe, sandal, or other article of footwear. In this instance a backing member 8, functioning as the bottom layer of the insole structure, is utilized. This backing member is preferably made of fiberboard impregnated with latex or another suitable substance to render the same elastomeric so that the backing member will not cup, harden, crack or lose its shape during usage. It is not essential that such particular type of backing member be utilized, since leather or the like could be substituted, but it is well known in the industry and has proven quite successful commercially. Since the backing or bottom member 8 is not in itself a thermoplastic subject to heat sealing, a marginal stripe 9 of thermoplastic material is placed upon the backing member, a vinyl adhesive being quite satisfactory for this purpose.

In this instance, the above described bottom layer 3 is not necessary, a cushion layer 2 is laid directly upon

the backing member, and the cover layer 1 disposed thereover. Thus, with suitable heat sealing dies, the cover layer 1 and the cushion layer 2 if the same is of thermoplastic material, are heat sealed to the stripe of thermoplastic material on the backing member, thereby bonding the entire structure into an integral whole. That structure may then be cemented to the outer sole or to a cork filler or the like and then function as the entire cushion insole for the shoe. It may also be secured in any other desired manner and may readily be used in the cemented process type shoes now being made for men, women, or children, and also used in the commonly known Goodyear Welt shoes. The cover layer is the same as above described and provides a slippery durable surface covering.

It is not essential that the bonding heat seal seam 4 or the bonding heat seal seam 10 of FIG. 4 to the only means of attaching the layers together. Should a firmer insole be desired a pattern in the form of bar seals as diagrammatically indicated at 11 in FIG. 1 may readily be utilized. And such a pattern of bar sealing may be designed to provide an attractive appearance.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim:

1. An insole comprising a cushioning intermediate layer, a top and thinner sheet of woven thermoplastic strands, and a bottom layer embodying heat sealable material, with the top sheet electronically heat sealed to the bottom layer, wherein the improvement comprises the top layer being woven with tightly battened strands in a twill weave whereby said top layer is extremely smooth permitting the foot of the user to glide easily thereover in either direction, and said cushioning layer is also of thermoplastic foam material and the heat seal seam joining the top sheet and bottom layers defines the outline of the insole, and at least one bar seal within said defining heat seal seam.

References Cited

UNITED STATES PATENTS

1,780,574	11/1930	Williams	36-44X
2,383,052	8/1945	Everston	36-44X
3,170,250	2/1965	Scholl	36-44
2,784,502	3/1957	Morali	36-44
3,170,250	2/1965	Scholl	36-44

ALFRED R. GUEST, Primary Examiner

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,555,709 Dated January 19, 1971

Inventor(s) M. L. Raffaelli, Sr.

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

Column 3, line 16, "bonding" should be read --bounding.

Column 3, line 17, "bonding" should be read --bounding, and
"to" should be read --be--.

Column 4, list of References Cited, "3,170,250" 2/1965" (first
occurrence) should be read --2,748,502
6/1956--.

Signed and sealed this 21st day of September 1971.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Acting Commissioner of Patents