Dec. 30, 1952 S. M. GRISWOLD 2,623,306

WELT INSOLE

Filed March 17, 1949

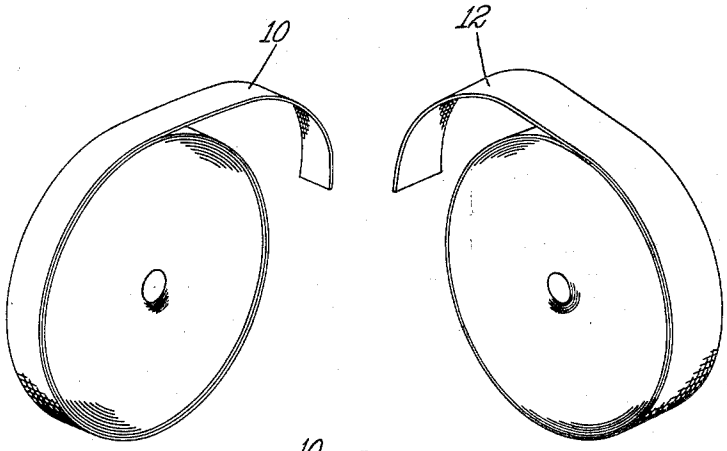


Fig.1 Fig.2

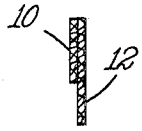


Fig.3

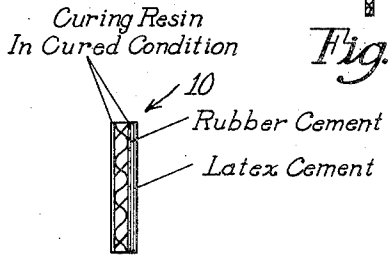


Fig.4

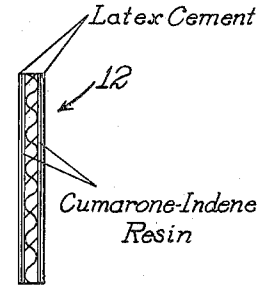


Fig.5

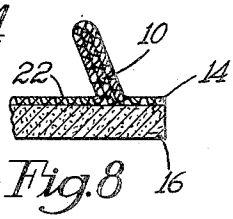


Fig.8

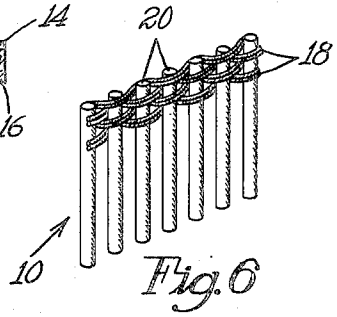


Fig.6

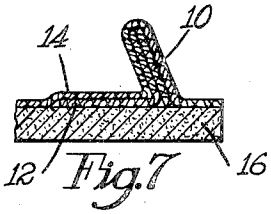


Fig.7

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UNITED STATES PATENT OFFICE

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WELT INSOLE

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2 Claims. (Cl. 36—22)

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This invention relates to welt insoles having stiffening and supporting means in their ribs.

Frequently, in this art, canvas is laid over a core piece to form a rib, the core piece giving shape to the rib by supporting the fold of canvas laid over it. Objects of this invention are to provide a satisfactory material for use as a core piece. Laminated material such as pasteboard or a board of fiber impregnated with latex have been used. However, the pasteboard is too weak and the impregnated fiberboard is not easily penetrated by the needle. In either case, the needle is apt to be deflected so that it passes under the core piece, which is objectionable because it produces irregularities in the feather line of the shoe. Furthermore, the material previously used has had to be thick to provide the necessary strength, whereas it is desirable that the core piece be thin, the criterion being a thin, strong, penetrable and widthwise flexible strip.

In cementing canvas to the core piece with pressure-responsive cement, such as latex, a better bond to the stiffened core piece will be obtained if the core piece is first coated with rubber cement.

It has been found that a welting machine having its needle set for operation on regular economy work does not operate satisfactorily on shoes having insoles with ribs comprising the previously used core materials and that a resetting of the needle is required. When the ribs of insoles comprise the core piece of the present invention, no resetting of the needle is required.

In the manufacture of insoles by the method described in Letters Patent of the United States No. 2,538,776, granted January 23, 1951, upon my application, the strip forming the core piece, during its introduction into the fold of the canvas, is bent widthwise and pasteboard or fiberboard core pieces would not always stand this bending without delaminating or breaking, whereas the core piece of the present invention is especially adapted for use in that method. To meet the above objections and to overcome these objections to prior materials, the present invention provides a core piece comprising a strip of fabric such as Gem duck which is so stiffened with a stiffening material as to withstand the widthwise strains to which it is subjected, a core piece stiffened with a curing resin, a core piece to which latex will adhere with a good bond, and a core piece which is thin and penetrable by the needle without tendency to "strand," that is, to catch on the barb of the needle. In practice, the core piece is preferably united with a wider, less stiffened

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strip so that a marginal portion of the wider strip may be turned at right angles to the core piece and secured to the body portion of an insole to serve as an anchorage for the core piece and to assist in preventing deflection of the needle under the core piece. This construction also affords a better abutment for the channel guide and a firmer rib to hold the inseam stitches.

These and other attributes and advantages of the invention will appear from the following description when read in connection with the accompanying drawing and will be pointed out in the appended claims.

In the drawing—

Fig. 1 represents a coil of the core piece material stiffened with a curing resin;

Fig. 2 represents a coil of a less stiffened, wider reinforcing strip;

Fig. 3 is a cross-section of a core after the core piece and the reinforcing strip are united;

Fig. 4 is an enlarged diagrammatic cross-section of the core piece of Fig. 1, the legend indicating its successive treatments;

Fig. 5 is a view, similar to Fig. 4, of the wider reinforcing strip;

Fig. 6 is a diagrammatic view indicating the size and arrangement of the strands in the core piece;

Fig. 7 is a fragmentary cross-section of an insole in which a core piece with a reinforcing strip has been used, a strip of canvas having been formed over it; and

Fig. 8 illustrates another insole construction in which a core piece is used without the reinforcing strip.

In the manufacture of the core piece 10 (Fig. 1) the procedure is as follows: A wide strip of canvas, such as Gem duck, is immersed in Resinox, a thermosetting or curing resin of the phenolic aldehyde type manufactured by the Monsanto Chemical Company, of Springfield, Massachusetts. The resin numbered 465 has been found suitable. After removal from the Resinox, the excess is scraped off and the material run through squeeze rolls to cause thorough penetration. The strip is then passed through an oven where, after drying, it is subjected to a temperature of 300° F. for about 90 seconds. The material is next coated on one side only with rubber cement. This is done by bringing the material into contact with the upper portion of an applying roll which is dipping into thin rubber cement, the excess being scraped off. The material then passes through an oven heated by steam pipes to evaporate the rubber solvent. It has been found that a better

bond of latex to the core piece 10 is obtained if the strip is first coated with rubber cement, though of course the rubber cement coating may be omitted. Finally the material is coated with latex on the side previously coated with rubber cement and allowed to dry. From the material thus treated core pieces 10 of indefinite length and about one-fourth inch wide are made.

An anchoring and reinforcing strip 12 is preferably made of the same material (Gem duck) and is treated first with a 20% solution of coumarone-indene resin V, which may be that manufactured by the Barrett Company, of 40 Rector Street, New York, N. Y. When dry, the strip 12 is coated with latex on both sides. The material thus treated is made into strips 12 of indefinite length but nearly twice as wide as the core pieces 10. The core pieces 10 and reinforcing strip 12 are then united by pressure, one edge of the strip 10 being flush with the edge of the strip 12, as shown in Fig. 3, the latex-coated side of the core piece 10 being next to the strip 12.

This composite strip may be used with a cemented strip of canvas 14 laid over it to form a reinforced rib on a body layer or insole 16, the single-ply portion of the strip being applied to the insole and the strip 14 cemented over it, as indicated in Fig. 7.

The core piece 10 made in the manner described comprises warp threads 18 extending lengthwise of it and filler threads 20 extending crosswise of it. In Gem duck the filler threads 20 are larger than the warp threads; for example, there may be 72 warp threads to the inch and 32 filler threads to the inch. The filler threads, being larger and being impregnated with a curing resin as described, are able to withstand widthwise pressure applied to the strip. Such strips, when tested by applying pressure widthwise to them, have sustained very substantial pressures before buckling. This attribute is particularly important when such strips are used in the manufacture of insoles by the method disclosed in the above-mentioned patent where the core piece is forced into the fold of an all-over layer of canvas 14 (Fig. 7). A suitable insole rib may be formed by utilizing the core piece 10 without the strip 12, the core piece being enclosed in a strip of canvas 22 wide enough to provide flanges for attaching it to an insole or body portion 16 on each side of the rib, as shown in Fig. 8.

While the Resinox 465 has been found satisfactory as a stiffening material for the rib, other stiffening material which will produce the required effect may be employed, though a curing resin is believed to be preferable. Other curing resins than Resinox may be employed whether the curing is effected by heat, as in the case of Resinox, or is effected by a catalyst, by chemical means, or is naturally self-hardening by a lapse of time. Other curing type aldehyde resins which may be used are the urea-formaldehyde resins and the melamine-formaldehyde resins. These resins may be cured by heat in the same manner as Resinox, which is understood to be of the phenol-formaldehyde type.

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

1. A welt insole having a rib set inwardly from its edge, said insole comprising an unchanneled body portion of insole size and shape, an all-over layer of canvas, said layer having a fold therein forming in part said rib, said fold enclosing a stiffened core piece of Gem duck having its filler threads extending heightwise of the rib, said core piece being impregnated with a curing type aldehyde resin to form a thin, strong widthwise flexible core piece readily penetrable by a sewing needle having no tendency to strand and having high resistance to pressure applied heightwise of the rib, said core piece being reinforced by a less stiffened strip of Gem duck separate from the core piece, said reinforcing strip being impregnated with coumarone-indene resin, said strip being twice as wide as the core piece, one-half of said strip being adhesively secured to said core piece and the other half of the strip being cement-attached to the said body portion to prevent deflection of the needle under the core piece, said all-over layer and said body portion being attached by cement alone to each other inside of and outside of the rib, and said all-over layer being cement-attached to said reinforcing strip inside of the rib.

2. A welt insole having a rib set inwardly from its edge, said insole comprising an unchanneled body portion of insole size and shape, an all-over layer of canvas, said layer having a fold therein forming in part said rib, said fold enclosing a stiffened core piece of Gem duck having its filler threads extending heightwise of the rib, said core piece being impregnated with a curing type aldehyde resin and coated with latex cement to form a thin, strong widthwise flexible core piece readily penetrable by a sewing needle having no tendency to strand and having high resistance to pressure applied heightwise of the rib, said core piece being reinforced by a less stiffened strip of Gem duck separate from the core piece, said reinforcing strip being impregnated with coumarone-indene resin and coated with latex cement, said strip being twice as wide as the core piece, one-half of said strip being adhesively secured to said core piece and the other half of the strip being cement-attached to the said body portion to prevent deflection of the needle under the core piece, said all-over layer and said body portion being attached by cement alone to each other inside of and outside of the rib, and said all-over layer being cement-attached to said reinforcing strip inside of the rib.

STANLEY M. GRISWOLD.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,298,156	Arlidge	Mar. 25, 1919
1,352,739	Egerton	Sept. 14, 1920
1,654,240	Davis	Dec. 27, 1927
1,760,820	Drew	May 27, 1930
1,776,879	Baekeland	Sept. 30, 1930
1,973,124	Swan et al.	Sept. 11, 1934
1,998,125	Eno	Apr. 26, 1935
2,021,370	Reynolds	Nov. 19, 1935
2,106,385	Springer	Jan. 25, 1938
2,128,625	Charch et al.	Aug. 30, 1938
2,341,713	Griswold	Feb. 15, 1944
2,427,739	Paulsen	Sept. 23, 1947
2,458,500	Bertrand et al.	Jan. 11, 1949
2,464,783	Dillehay	Mar. 22, 1949