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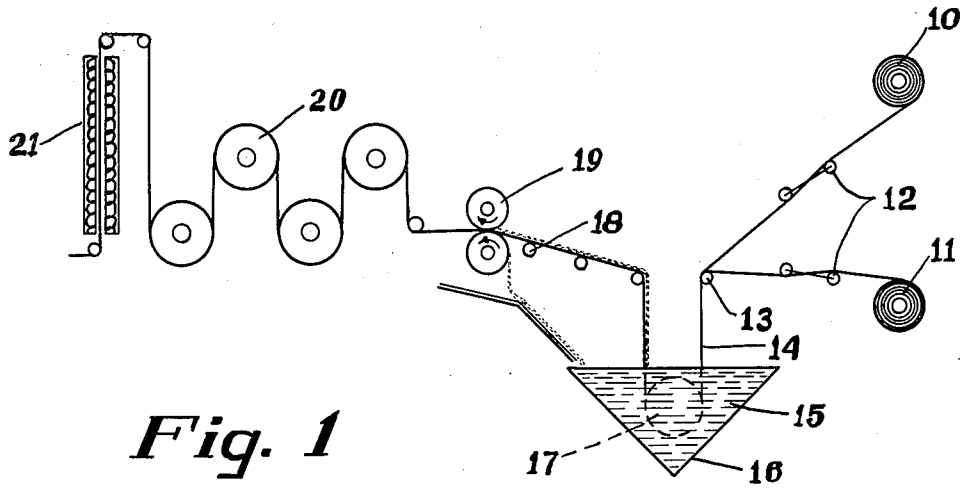
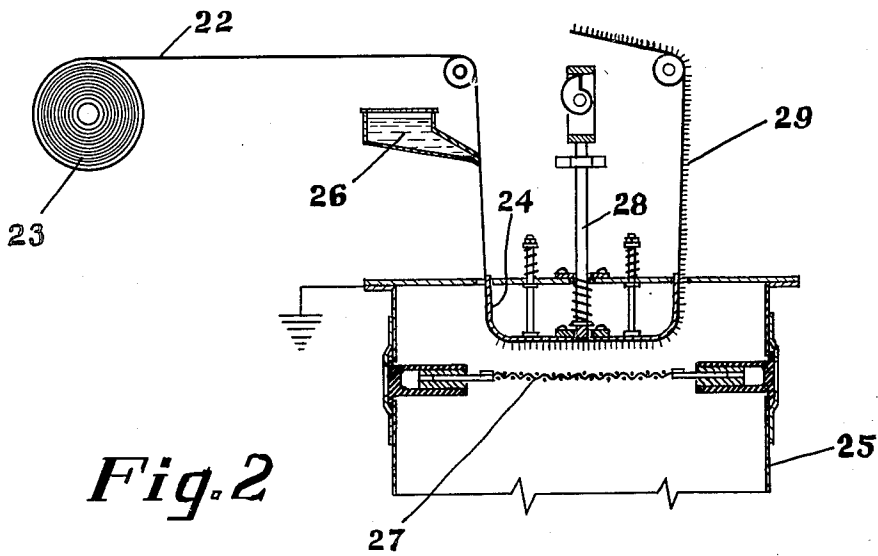
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2,619,441

SUEDED QUARTER LININGS

Filed Oct. 10, 1950

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

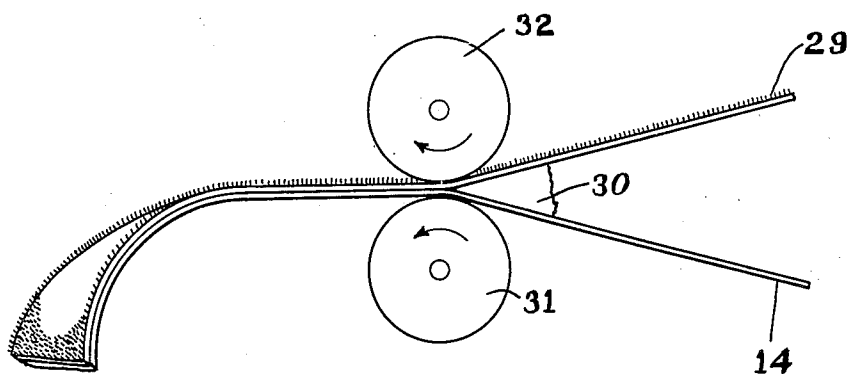


Fig. 3

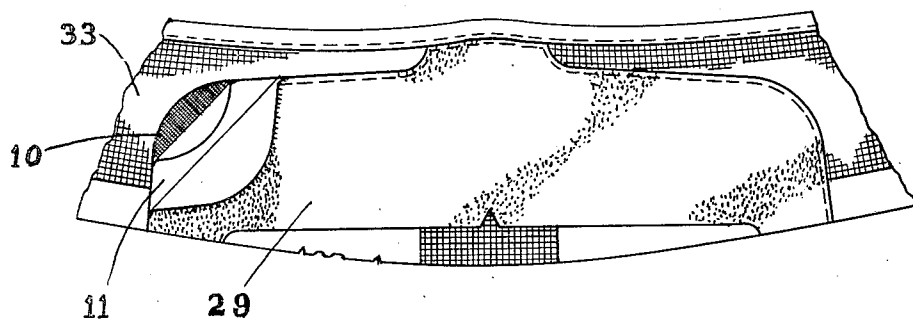


Fig. 4

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UNITED STATES PATENT OFFICE

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SUEDED QUARTER LINING

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2 Claims. (Cl. 154-46)

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This invention comprises an improved shoe lining presenting a sueded flocked non-slip surface inside the shoe and having latent stiffening properties for imparting stiffness to the counter or other parts of shoe uppers. More particularly, it comprises a unitary lining structure possessing counter stiffening properties and presenting a flocked quarter lining surface. The improved lining is of the thermosoftening type so that it may be assembled with counter portions of upper leather or other outer integument in a heat-softened and moldable condition and molded to the contour of the last during the pulling over and heel-lasting steps of the shoemaking process.

Heretofore it has been the general practice, in the construction of the counter portions of shoes, to insert a fiber counter stiffener as a distinct or unitary element between the leather or outer integument and an inner textile lining. The stiffener may be molded either separately or with the other plies of the counter pocket, but in commercial shoemaking practice a three-ply construction has generally been considered necessary and this entails fitting, tempering and assembling operations which must be carried out with accuracy in order to insure a satisfactory product. The three-ply construction which includes a fibre stiffener also necessarily results in a considerable and sometimes objectionable thickness of material which it is often difficult to shape smoothly and accurately to the last about the heel seat of the shoe. It is usually considered necessary to apply an adhesive to one or both faces of the counter stiffener to secure it adhesively to at least one of its enclosing plies and generally to both of them.

Patent No. 2,391,445 dated December 25, 1945, discloses a fiberboard counter stiffener having a resinous surface coating with an embossed pattern thereon. This unit is designed to be combined with shoe upper material and molded to form the counter portion of a shoe prior to assembling it in the shoe upper. The resulting construction is not suitable, however, for high grade work.

The principal object of this invention is to provide a laminated upper lining which will serve as the quarter lining as well as the counter stiffener and which is thermosoftening and can be readily molded to the contour of the last during the pulling over and heel lasting steps. Thus an important economy is introduced into the shoemaking process both because less material is used and because the number of shoemaking operations required is correspondingly reduced. The counter portion that results from utilization of

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this invention in shoe construction possesses all the characteristics of counters of the three-ply construction both in the stiffening effect and in the quarter lining surface that is presented. Further, it has the feel of leather counter-stiffeners used in the more expensive shoes, being flexible in the top section as well as stiff and firm toward the bottom. An important advantage realized through use of my improved laminated upper lining is found in a two-ply construction which presents a more readily moldable quarter portion as well as a counter-stiffener that becomes molded to the last in a thermosoftened state, during the pulling over and heel lasting steps, and requiring no preliminary molding operation as such.

The invention also includes within its scope a composite stiffener and quarter-lining member which will become adhesively secured to the outer integument during the pulling over and heel lasting steps, thereby eliminating the separate step of cementing the conventional counter-stiffener to the upper leather.

I have discovered that these and other desirable results may be achieved by employing as the composite stiffening and quarter-lining member a laminated construction comprising a foundation ply of reinforcing and supporting fabric, a ply of a flocked quarter-lining material and an intermediate film of a normally resilient thermosoftening film-forming bonding composition which acts to bond the quarter-lining to the foundation ply. Optionally, the composite unit may carry on the outer surface of its foundation ply a coating of a heat-sensitive adhesive adapted to secure the composite unit to the upper leather or other outer integument at the same time the counter is molded.

The reinforcing and supporting foundation ply may be of any fibrous or textile fabric sheet. Its essential function is to form a thin and structurally strong base ply to which the quarter-lining material can be permanently attached through the medium of a bonding composition.

While a textile material, such as an Osnaberg of weight 3.65 yds. per pound may be used, it is preferable to use a material possessing greater body and greater tensile strength. A very satisfactory material comprises a two-ply lamination of single nap flannel which is formed by impregnating and bonding the flannel, nap sides together, with a polyvinyl acetate emulsion which, after proper controlled distribution of its solids throughout the two fabrics and subsequent dehydration, results in a tough and durably

strong laminate importantly characterized by the thermoplasticity of the continuous polyvinyl stiffening film. Thus the stiffened two-ply fabric when used as a foundation ply provides a shoe structure light in gauge and adapted to reproduce the compound curvature of the heel of a normal shoe last when the ply is softened by heat and caused by pressure or tension to conform to the last.

The inner quarter-lining ply consists of any suitable sueded flocked sheeting which may be incorporated as one ply of laminated structure. Alternatively, the sueded flock may be affixed directly to the surface of the thermoplastic structural laminate, thus eliminating the necessity for separately attaching two plies.

The thermosoftening bonding adhesive may be any flexible, moisture-resistant film-forming composition which softens sufficiently by either moist or dry heat to conform unresistingly to the curvatures of the heel of a last under the tensions presented thereby by normal mechanical lasting practice and at temperatures commonly utilized in pre-heating shoe uppers preparatory to lasting operations and capable of being rendered adhesive by the use of such moist or dry heat or through the application of appropriate solvents, or both. This same bonding adhesive as used to attach the foundation ply to the quarter-lining member can, if desired, be also used as the adhesive material on the surface of the blank opposed to the quarter-lining surface, or a different adhesive of other characteristics concerned with viscosity under activation may be selectively used for this latter purpose.

The above described combination material, comprising when finished a flocked quarter-lining and foundation ply united by a thermosoftening bonding adhesive and having on its surface opposite to the quarter-lining a thermosoftening adhesive, a subject to be cut into blanks of the desired shape by conventional methods. Such blanks are thereafter skived around their base and top edges so that the stitching employed around the top line of the blank may pass through a plurality of the fibers in order to improve stitching tear strength. In using such blanks in force-lasted shoes made under the conventional California process, scarfs around the base of the blank will be of such length so as to cause the edge of the blank to be resiliently soft in receiving the stitches required to attach it to the sock lining at all points where both become co-engaged.

In accordance with the present invention, by using the bonding composition to secure adhesively the quarter-lining material in its functional relationship to the foundation ply as well as to impart some stiffness to the ultimate combination, the necessity of separately cementing a counter-stiffener to the quarter-lining is obviated; and by using conventional quarter-lining fabric as one of the plies of the laminated self-stiffening lining, the need of a separate ply of fabric used in conventional shoe structure is similarly eliminated. Thus the invention results in a saving of the cost of separately preparing and molding counters, the cost of assembling such counters in shoes, cementing counters in place, and the danger of misplaced stiffeners in the shoe. It also obviates the necessity of carrying large inventories of counters of different sizes and styles.

These and other features of the invention will be best understood and appreciated from the following description of preferred embodiments thereof, selected for purposes of illustration and

constructed as shown in the accompanying drawings in which:

Fig. 1 is a diagrammatic view showing schematically a convenient procedure for preparing the foundation ply,

Fig. 2 is a similar view showing one procedure for preparing a flocked surface fabric,

Fig. 3 is a similar view showing a method of combining the foundation ply and a ply of flocked fabric, and

Fig. 4 is a plan view of a counter lining assembled with a shoe upper.

The preferred foundation ply may be conveniently prepared from two sheets of single nap flannel of the desired weight and width, for example, about 3.90 yards per lb., 44 inches wide with nap on one side of each sheet. The two plies of flannel are first saturated or impregnated with polyvinyl acetate emulsion and then dried by being passed about steam heated drums and banks of infra-red lamps.

One convenient procedure for preparing the foundation ply is shown in Fig. 1. Two rolls 10—11 of single nap flannel are simultaneously unrolled, passing through tensioning rolls 12 and combining nap sides together at the roll 13. The combined plies of flannel 14 are then saturated with polyvinyl acetate emulsion 15 contained in a trough 16 in which is submerged a roll 17 around which pass the combined plies. From the submerged roll 17 the combined plies pass upwardly and thence over three guide rolls 18 to a pair of squeeze rolls 19 adjusted as to their relationship to remove excess emulsion which drains back to the trough 16. The combined plies 14 are then dried by passing around several steam heated drums 20 and finally through banks 21 of infra-red heaters. The rate at which the combined backing material 14 can be produced is dependent upon the rate of drying and must be adjusted so that a dry product emerges.

The sheet of suede flocked material may be prepared by any convenient or commercial process available, for example that fully disclosed in United States Letters Patent No. 2,173,032, September 12, 1939, Wintermute. As suggested in Fig. 2, the fabric 22 for this purpose is led from a coil 23 over suitable guide rolls and across the lower face of a plate electrode 24 contained in an enclosure 25. An adhesive coating is supplied to the fabric by a reservoir 26 so that in passing across the electrode 24 an adhesive surface is exposed to bombardment by loose flocking material in the shape of pile-forming fabric not over $\frac{1}{8}$ " in length.

The illustrated flocking apparatus includes a rapidly vibrating screen 27 of coarse mesh through which the flocking fibers are driven by an upwardly directed current of air. As the fibers begin to deposit on the sheet 22, the electrode 24 is rapped by a cam actuated rod 28 so that vibration is imparted to all of that portion of the sheet 22 which is held against the underside of the electrode 24. Any fibers not attached to the sheet by the adhesive are thus jarred away from the pile to be recirculated. The finished flocked fabric 29 passes upwardly out of the receptacle 25 and is now ready to be combined with the foundation ply.

The flocked fabric, which now has a suede appearance, may now be combined with the foundation ply 14 to produce the laminated self-stiffening quarter lining of this invention by being fed between calender rolls 31, 32 as shown in Fig. 3. A bank of suitable stiffening and bonding com-

position 30 may be maintained between the two plies at their entrance to the nip of the calender rolls. One satisfactory bonding and stiffening composition consists of 90 parts opal wax, 10 parts stearic acid, and 60 parts ethyl cellulose. The opal wax and the stearic acid are first melted and mixed together, and then the ethyl cellulose is added and heating is continued while the batch is stirred until a homogeneous viscous mass results. This composition becomes soft and pliable at about 200° F. and may be rendered adhesive by heating to a temperature of approximately 260° F.

While it is within the scope of the invention also to render the bonding composition adhesive through the action of solvents, it is preferred to use heat and thereby avoid the time and necessity of allowing the solvent to evaporate.

One example of the improved quarter lining of my invention is shown in Fig. 4. It is died out in the required shape from the laminated sheet produced in accordance with Fig. 3. Preferably the top margin of the foundation ply 10—11 is skived to facilitate a neat assembly with the upper in the counter portion of the shoe and the molding of the lined upper during the pulling over and heel lasting steps. If it is desired adhesively to combine the quarter lining with an outer integument of the upper, a coating of heat activating adhesive may be applied to the outer surface of the foundation ply. This adhesive may be of the same composition as that described above, although any satisfactory composition may be employed. One such is compounded of the following formula:

50 parts by weight gum rosin
50 parts ethyl cellulose
50 parts stearic acid.

These ingredients are combined by melting them together with stirring.

It is contemplated that, if desired, the flocking material may be applied directly to the foundation ply, that is to say, the laminated and impregnated foundation ply 10—11 may be substituted in Fig. 2 for the fabric 22.

In manufacturing shoes embodying the improved quarter lining of this invention, ordinary shoemaking processes are used. The quarter lining may be conveniently stitched like any other lining along its margins to the outer integument 33 of the upper. The combined parts of the upper are then heated to render the laminated quarter lining soft and moldable, and when the foundation ply carries an adhesive coating to activate that adhesive. Heating may conven-

iently be done in heaters similar to conventional box toe heaters or adaptations thereof. The upper thus assembled is then placed upon the last and pulled over in the conventional manner and subsequently lasted, thereby conforming the softened counter portion to the contour of the heel end of the last and securing adhesively the outer integument to the quarter lining. In addition to a very substantial saving in shoemaking costs, the improved quarter lining of my invention materially improves the appearance of the inside of the counter portion of the shoe, imparting to it a smooth and clean effect and providing a non-slipping suede surface for engagement with the wearer's foot.

Having thus disclosed my invention and described in detail a preferred method by which it can be carried out, I claim as new and desire to secure by Letters Patent:

1. A laminated unitary shoe lining having self-stiffening properties and comprising a foundation ply, a ply of textile fabric having a single flocked surface, and an intermediate ply of thermo-softening film-forming bonding material uniting adhesively the foundation ply and the flocked fabric with its flocked surface exposed for contact with the foot of the wearer, and having a film of a heat-activatable adhesive compound on the outer surface of the foundation ply adapted to become adhesively activated and to secure the laminated lining combination to the outer integument of the upper of the shoe when heated preparatory to the pulling over and heel lasting steps of the shoemaking process.

2. A quarter lining having counter-stiffening properties and comprising a multiply foundation of textile fabric carrying internally a uniformly distributed charge of thermoplastic stiffening compound and having one of its faces coated with a heat-sensitive adhesive compound for attachment to an outer integument of a shoe upper, the lining as a whole presenting a sueded flock texture for exposure inside the upper next the foot of the wearer.

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