Oct. 24, 1944. D. C. LIPPMANN 2,360,953

WEARING APPAREL

Filed May 21, 1942

Fig. 1.

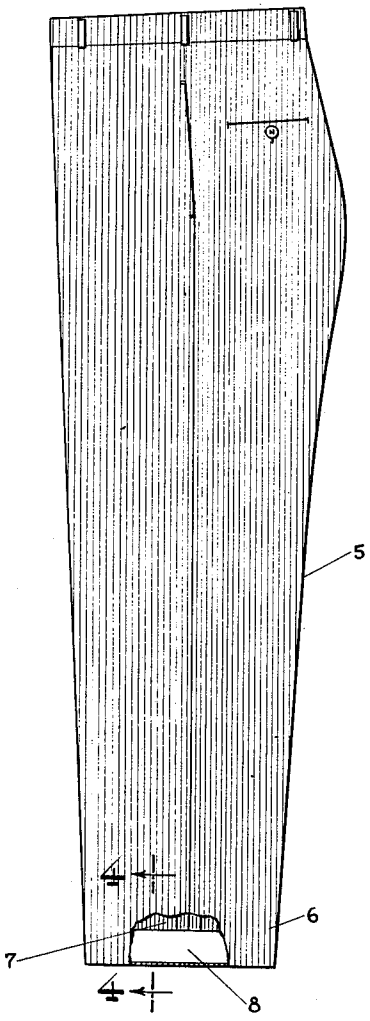


Fig. 2.

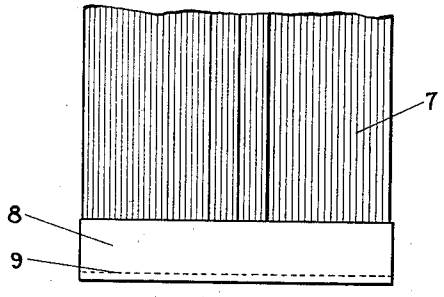


Fig. 3.

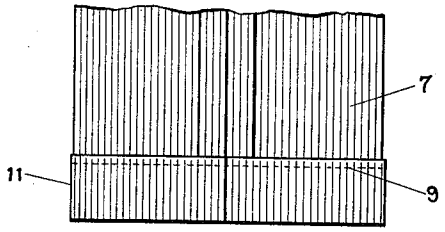
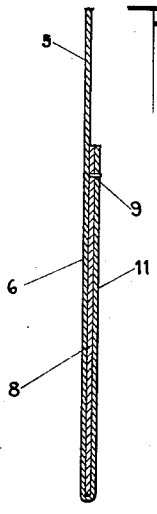


Fig. 4.



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WEARING APPAREL

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Application May 21, 1942, Serial No. 443,853

2 Claims. (Cl. 2—232)

This invention relates to wearing apparel, and relates more particularly to an improved method of finishing the bottoms of trousers, slacks and the like.

In one of the prior methods of finishing the bottoms of trousers, slacks and the like, hereinafter referred to as "slacks," without cuffs, the bottoms were turned up and sewed by a felling machine adjusted so that the stitches would not show through to the outside. However, this method of finishing often caused a wrinkling or puckering of the slack bottom. Another method formerly employed in finishing cuffless slacks was to paste the turn-up with a cement. This method was also far from satisfactory for the reason that in cleaning the garment, the cement was often washed away. It is accordingly an important object of this invention to provide a novel method of finishing slack bottoms without cuffs which will be free from the above and other disadvantages and which will be especially simple and efficient in operation.

Another object of this invention is the provision of an improved method of finishing cuffless slacks in which felling operations, cements and similar expedients are obviated.

A further object of this invention is to provide a novel method of finishing slacks without cuffs by employing a strip of woven fabric made of or containing yarns, filaments, or fibers of a thermoplastic material.

Still another object of this invention is to produce cuffless bottoms on slacks which are free from wrinkles and puckers, and which have more "body" thereby causing the slacks to hang better in wearing.

Other objects and advantages of this invention will appear from the following detailed description and drawing.

In the accompanying drawing wherein the preferred embodiment of my invention is shown,

Figure 1 is a side elevational view of a pair of slacks, a portion thereof being cut away at the bottom to show more clearly the position of the strip of woven fabric employed in accordance with my invention,

Figure 2 is a detail view, on an enlarged scale, showing the strip of woven fabric, employed in accordance with my invention, sewn on the inner side of the slack leg before it is turned up,

Figure 3 is a detail view, on an enlarged scale, of the inner side of the slack leg after the bottom has been turned up and bonded in position to form a finished bottom, and

Figure 4 is a cross-sectional view taken on line 4—4 in Figure 1, on an enlarged scale, showing the construction of the cuffless slack bottom produced in accordance with my invention.

Like reference numerals indicate like parts throughout the several views of the drawing.

In accordance with my invention, I finish the bottoms of slacks by first turning the slacks inside-out, applying a strip of suitable width of woven fabric made of or containing yarns, filaments or fibers of a thermoplastic material to the bottom of the slacks, turning up the bottoms, the width of the turn-up being the width of the strip of woven fabric, and then applying heat and pressure to the turn-up, with or without the use of a volatile liquid which is solvent, a latent solvent or swelling agent for the thermoplastic material, so as to effect the lamination of the slack bottoms. I prefer, however, to employ as the volatile liquid a denatured ethyl alcohol sold under the trade name "Solox."

The woven fabric employed as an adhesive material, hereinafter called the adhesive fabric, may be made of or contain yarns, filaments or fibers of any suitable thermoplastic material which becomes sticky or tacky by the action of heat, in the presence or absence of a solvent, latent solvent or swelling agent therefor. I prefer, however, to employ an adhesive fabric prepared by treating a woven fabric containing yarns, filaments or fibers of a thermoplastic organic derivative of cellulose and yarns, filaments or fibers of a non-thermoplastic material, such as cotton, regenerated, or reconstituted cellulose, silk, wool, linen, etc., with a plasticizer for the organic derivative of cellulose and then ageing the fabric for at least four days at a temperature of from 30 to 70° C. and preferably from 40 to 50° C.

Any suitable organic derivative of cellulose may be employed in preparing the adhesive fabric employed in accordance with the present invention. For example, the organic derivative of cellulose may be an organic ester of cellulose such as cellulose acetate, cellulose propionate or cellulose butyrate, or it may be a cellulose ether such as ethyl cellulose or benzyl cellulose. Other synthetic materials may also be employed in preparing the adhesive fabric. For example, thermoplastic polyvinyl or other synthetic resins, such as vinyl chloride, vinyl acetate, vinyl alcohol, crotonal, acrylic acid, methyl methacrylate, etc., may be employed as filaments in or impregnants or coatings for the adhesive fabric. However, the invention will be described in connection with the use of thermoplastic or-

ganic derivatives of cellulose and particularly cellulose acetate, since cellulose acetate at the present time is commercially the most important of the synthetic thermoplastic materials.

The adhesive fabric may be formed by weaving, knitting, knotting, netting yarns or filaments of cellulose acetate with yarns or filaments of non-thermoplastic materials into a fabric. The production of the fabric is preferably effected in such a manner that there is a uniform dispersion of yarn or filaments of cellulose acetate with the yarns or filaments of the other type. Where the adhesive fabric is formed by weaving or knitting yarns containing cellulose acetate with a textile yarn such as cotton, regenerated cellulose, linen, etc., it is preferable to so weave the yarns of cellulose acetate that they form floats on the surface of the fabric. In such a fabric the structure of the cellulose acetate yarns may be partially or substantially destroyed in the coalescing action without materially weakening the fabric, as they are contained in the fabric only as floats and not as a part of the fundamental structure thereof. The cellulose acetate yarns may be woven to alternate in the warp or in the weft or both in any desired degree of alternation with the yarns of non-thermoplastic fibers. This alternation may be, for instance, 1, 2, 3 or more cellulose acetate yarns, with 1, 2 or 3 or more cotton or other non-thermoplastic yarns. For convenience the warp may be made of such alternation of cellulose acetate yarn and yarn of other fibers, while the weft may consist wholly of such cellulose acetate yarn or wholly of yarn of other fibers. Furthermore, the weft may consist of an alternation of such cellulose acetate yarns and non-thermoplastic yarns of other fibers. However, where the fabric is made in ordinary looms the alternation may be used in which either warp or weft consists wholly of cellulose acetate yarn while the other component consists of non-thermoplastic yarns.

The adhesive fabric may also be formed of non-thermoplastic yarns and then have applied thereto a cellulose acetate powder, film or coating. Furthermore, a part or all the yarns of the fabric may be formed of a mixture of cellulose acetate fibers or filaments mixed with non-thermoplastic fibers or filaments. Although this invention is of particular importance in the production of adhesive fabric containing both cellulose acetate material and non-thermoplastic material, the ageing treatment may also be applied to adhesive fabrics made wholly of cellulose acetate yarns to effect a conversion of same or a penetration of the plasticizer.

The adhesive fabric may be impregnated with plasticizer in any suitable manner. For instance, the plasticizer may be applied to the adhesive fabric by dipping the fabric in a bath of the plasticizer, passing the fabric through nip rollers to remove excess plasticizer and removing the volatile liquids, if any, by heat. Adhesive fabric may also have the plasticizer applied thereto by spraying the fabric with the plasticizer, emulsions containing plasticizer or solutions containing plasticizer. Continuous methods of applying the plasticizer are preferable and this is usually accomplished by drawing the fabric through a bath containing the plasticizer dissolved in a volatile liquid, removing excess liquids by nip rollers, doctor blades, etc., and then passing the fabrics through hot chambers to remove the volatile liquids. The volatile liquid employed as a thinner or diluent for the plasticizer preferably has a softening or swelling action on the cellulose acetate such that the plasticizer is partially penetrated into the fabric at the time of application. If non-softening agents are employed a longer period of conversion must be had to effect a substantially complete migration and penetration of the plasticizer to the cellulose acetate.

Any suitable plasticizer may be employed for the cellulose acetate or other thermoplastic material employed. For instance, I may employ dibutyl phthalate, diethyl phthalate, dibutyl tartrate, diethyl tartrate, mono-ethyl-para-toluene sulphonamid, mono-methyl xylene sulphonamid, ether of ethylene glycol, methyl ether of ethylene, dimethoxy ethyl phthalate, triacetin, etc. A preferred plasticizer bath consists of about 58 parts dimethoxy ethyl phthalate, 4 parts triacetin and 40 parts of ethyl alcohol. There may be applied to the adhesive fabric a sufficient amount of this mixture of plasticizers such that upon removal of the alcohol there remains on the fabric from 10% to 60% or more of the plasticizer, based on the weight of the fabric. As stated above, the amount of plasticizer applied will depend upon the amount of cellulose acetate in the fabric and the use for which the fabric is intended as well as the particular type of plasticizer employed.

The adhesive fabric, after a plasticizer for the cellulose acetate is applied thereto, is converted to the more desirable state by an ageing operation involving the migration of the plasticizer from the non-thermoplastic portion of the fabric to the cellulose acetate portion of the fabric and also effecting a change in the nature of the cellulose acetate. The conversion of the adhesive fabric enhances the adhesive properties thereof such that it sticks better to outside layers of fabric when the composite article is subjected to heat and pressure. The conversion of the adhesive fabric allows it to have this property and still be stored in a condition such that it is not tacky enough nor sticky enough to stick to itself on the roll. This conversion of the adhesive fabric is effected by storing the fabric for a period of from 4 to 14 days or longer at room temperature. This time of conversion may be shortened by storing the fabric in a heated chamber maintained at from 30 to 70° C., preferably 40° C. to 50° C.

Referring now to the drawing for a more detailed description of my invention, the slacks shown in Fig. 1 and generally indicated by reference numeral 5 are provided with cuffless bottoms 6, the bottoms being finished in the following manner. The slacks 5 are first turned inside-out, the inside of the slack bottom being indicated by reference numeral 7, and the proper length of the leg determined. This length is the length of the leg required in the finished slack plus an extra length equal to the width of the adhesive fabric strip 8 which is preferably from 1½ to 2 inches but may be any other suitable width. Having cut the slack leg to the proper length, the adhesive fabric strip 8 is placed exactly along the bottom of the leg, and is stitched by machine along the circumference of the slack leg at a point about one-half inch from the bottom as shown by broken line 9 in Figs. 2 and 3.

After the adhesive fabric strip 8 is stitched in position, the subsequent steps in the finishing of the slack bottoms depend upon the nature of the fabric from which the slacks were made. Thus, where the slacks comprise an all wool worsted or tropical worsted, gabardine or similar fabrics, i. e., made of natural filaments or fibers, the turn-up, as shown at 11 in Fig. 3 is first made, sand-

wiching the entire width of the adhesive fabric strip 8 into the fold. The slacks are then turned right-side-out and the entire slack fabric turn-up is wet with, for example, denatured alcohol. The turn-up is then pressed until dry with a hot electric hand iron using a dry press cloth, or with a pressing machine. The slack bottom is thus laminated and finished.

Where the fabric of the slacks is of or contains filaments or fibers, such as cellulose acetate or other thermoplastic organic derivatives of cellulose, regenerated or reconstituted cellulose, or other synthetic filaments or fibers, the entire surface of the adhesive fabric strip 8 is first wet with denatured alcohol by means of a sponge, for example. The turn-up is now made, sandwiching the entire width of the adhesive fabric strip within the fold, the slacks are turned right-side-out and the turn-up is pressed and laminated as above but without the use of any additional denatured alcohol.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit of our invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. A cuff for garments such as trousers and the like, an edge construction comprising in combination, a portion adjacent said edge folded over on itself to form two layers of said garment material, a strip of fabric interposed between said layers, said strip incorporating thermoplastic material adapted to cause it to adhere to both of said layers upon application of heat and pressure to form a permanent folded garment edge, said strip being additionally attached to only said folded over portion by a row of stitching.

2. A method of finishing edges of garments such as trousers and the like, comprising positioning a strip of fabric having adhesive properties overlying the material of said garment adjacent the free edge thereof, permanently maintaining said strip in such position by a row of stitching passing through said strip and said garment material, folding said garment material over on itself to position said strip between the two adjacent garment material layers formed by said folding, and then causing said strip to adhere to said adjacent layers.

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