Jan. 26, 1965 N. F. GETCHELL 3,166,765

DURABLY CREASED TROUSERS AND METHOD OF CUFFING SAME

Filed Aug. 26, 1964

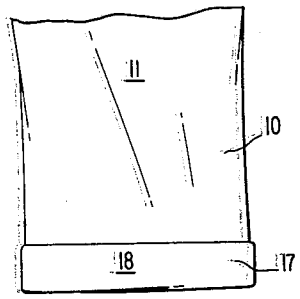


FIG.1

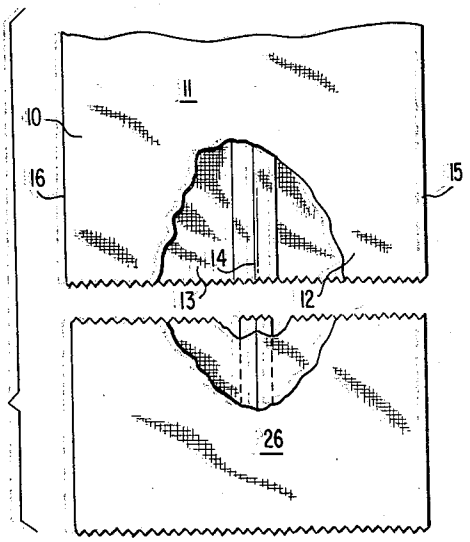


FIG.2

FIG.3

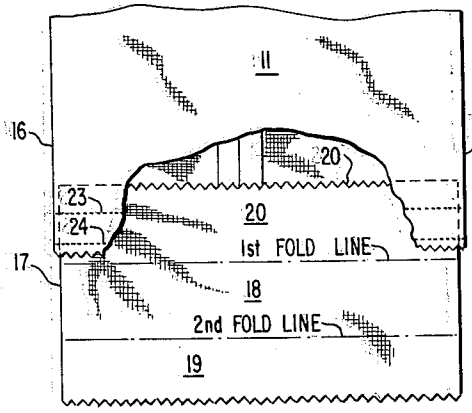
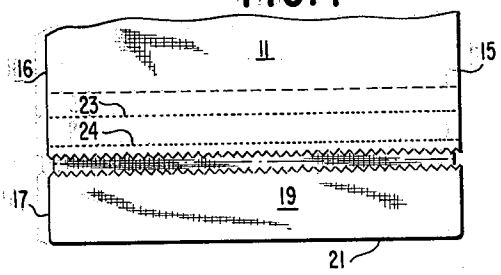


FIG.4



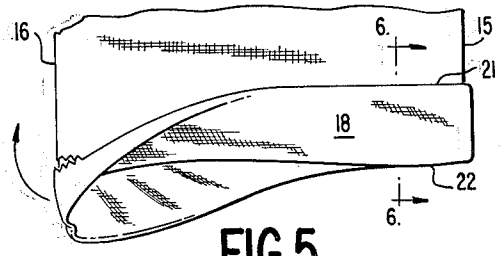


FIG.5

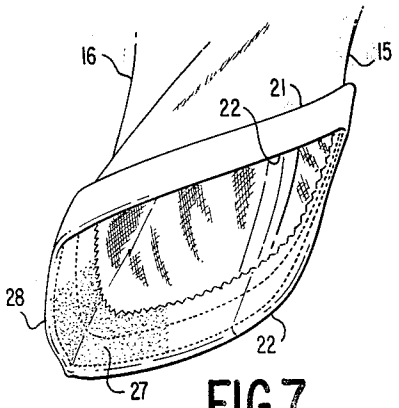


FIG.7

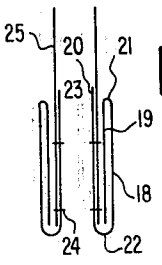


FIG.6

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DURABLY CREASED TROUSERS AND METHOD OF CUFFING SAME

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This application is a continuation-in-part of my co-pending application Serial No. 201,177, filed June 8, 1962, now abandoned.

This invention relates broadly to trousers formed of cellulose-containing material and, more particularly, to trousers containing cellulosic material which have been treated with wrinkle-resistant, crease-recovery, and wash/wear imparting chemical agents, and to a method of cuffing such treated trousers so that the cuffs have the same wrinkle-resistant, crease-recovery and wash/wear properties as the trousers.

During the last several years, the use of textiles consisting of or containing cellulosic fibers, such as cotton, regenerated cellulose (rayon), and blends of cotton and/or rayon with other natural and synthetic fibers has become more widespread due to the many processes which have been developed for imparting durable wrinkle-resisting, crease-recovery and wash/wear properties to these materials. Among the many other uses, such treated cellulose materials are used for men's trousers. While desirable creases placed in untreated cotton, rayon, and textile blends containing the same are not durable and are largely lost when the garment is either laundered or subjected to rain or even to very humid conditions, cellulosic textiles which have been treated with any one of the many resin and non-resin creaseproofing agents retain all creases which have been formed in the material prior to curing the agent thereon. Furthermore, while such untreated materials are readily susceptible to wrinkling during use, the treated textiles resist such wrinkling. Moreover, when the treated textile material or garment made therefrom is laundered and then hung to dry, not only is any crease formed therein prior to curing of the chemical agent retained, but the textile material dries in a substantially wrinkle-free state.

Cellulose fiber-containing textiles, such as cotton, rayon, linen and blends containing these fibers, have been used in making garments, including men's trousers. Such trousers are formed with longitudinally extending front and rear creases on the trouser legs prior to the curing of the creaseproofing agent with which the trousers have been treated. While these creases are retained during the life of the garment, due to the presence of the cured agent, it is difficult if not impossible to subsequently for many similar durable creases on the treated garment. This factor has been an obstacle to the increased use of these textiles for trousers.

Most of the trousers made by garment manufacturers and shipped to retail outlets are formed without cuffs. This enables the retail outlet to carry a smaller inventory than would otherwise be possible, since it is only necessary for the retailer to stock trousers whose size is governed by the dimension of the waist. If trousers were formed with cuffs by the manufacturer, the retailer would have to include several pairs of trousers with varying leg lengths in each waist size, and it is readily apparent that the size of the inventory required for such cuffed trousers would be almost prohibitive for small retailers.

In the usual retail sale, the purchaser is measured by the store tailor for the correct trouser length, and the cuffs are subsequently formed. Because the trousers have been treated with creaseproofing agents during their manufacture and now have wrinkle-resistant properties, any effort

by the tailer to impart durable creases to the top and bottom folded peripheral edges of the cuff will be resisted by the fabric. Thus any creases which may be formed in the cuffs are only temporary and will not appear as sharp as the longitudinal creases imparted by the manufacturer. Furthermore, as soon as the cuffs are subjected to rain, snow, high humidity, or laundering, the creases formed therein will largely disappear. Thus, purchasers of treated, wrinkle-resistant cotton trousers find it difficult, if not impossible, to have durable creases on the cuffs which match the durable longitudinal creases formed by the manufacturing process on the trouser legs.

Accordingly, it is an object of this invention to obviate the difficulties presently existing with regard to the formation of cuffs having durable creases on trousers which have been treated to resist wrinkling.

It is another object of the invention to provide trousers having cuffs with durable creases therein which match the appearance and wearability of the durable longitudinal creases formed in the trouser leg by the manufacturer and which have the same characteristics with respect to wetting or laundering as the remainder of the garment.

A further object of the invention is to provide separate trouser cuffs of the same material as the trousers, which cuffs, prior to being secured to the trousers, have imparted thereto durable wrinkle-resistant, crease-recovery and wash/wear properties.

Still another object of this invention is to provide a method for making a pair of trousers with cuffs which, from all outward appearances, are an integral part of the the store tailor for the correct trouser length, and the cuffs thereto.

In attaining the objects of this invention, one feature resides in separately forming and pretreating the cuffs with a creaseproofing chemical agent which is cured thereon after the cuffs have been formed, and then securing the treated cuffs to the inner bottom portions of the trouser legs after the purchaser has been measured and the trouser legs have been cut to his exact length, so that the trousers and cuffs attached thereto have the same crease-recovery, wrinkle-resistant, wash/wear properties.

Other objects, features, and advantages of the invention will be more apparent from the following disclosure when taken in conjunction with the accompanying drawing, wherein:

FIG. 1 is a side view of the bottom portion of a trouser leg having an embodiment of the cuff of the invention secured thereto;

FIG. 2 is an enlarged and exploded side view of the bottom portion of a trouser leg and the cuff material prior to its being folded and treated;

FIG. 3 is a side view of the bottom portion of a trouser leg having an embodiment of the cuff of the invention secured thereto and opened along two fold lines to show the structure of one embodiment of the cuff;

FIG. 4 is substantially similar to FIG. 3, except that the cuff is opened along a single fold line;

FIG. 5 is substantially similar to FIG. 4 with the cuff partially unfolded along the fold line;

FIG. 6 is a cross-sectional view taken along the lines 6—6 of FIG. 5, showing the separable feature of the cuff and the manner in which it is secured to the bottom of the trouser leg; and

FIG. 7 illustrates a further embodiment of the invention wherein the inner rear surface of the cuff is coated with a wear-resistant material.

Turning to the embodiment of FIG. 1, the bottom portion 10 of a trouser leg 11 has the cuff of the invention secured thereto.

From FIG. 2, it will be noted that the trouser leg 11 comprises a double layer 12, 13 of the fabric seamed along

an adjacent longitudinal edge 14 to form the tubular structure. While only a single longitudinal edge or seam 14 is illustrated in the drawing for the sake of simplicity of disclosure, it is recognized that almost all trousers have two such longitudinal seams, oppositely disposed and located centrally of the front and rear longitudinally extending creases 15, 16.

As is more readily seen in FIG. 6, the cuff 17 is formed from a strip of fabric which is similar to the fabric of the trouser, and has an outer surface 18, an inwardly and downwardly folded portion 19, and an inwardly and upwardly folded portion 20 which would normally overlie the portion 19. The folded portions 19 and 20 form upper crease 21 and lower crease 22 of the cuff, respectively.

As may be seen in FIG. 6, the inwardly and upwardly extending cuff portion 20 is secured by any convenient means, such as by sewing, stitching, and the like, about its circumferential surface to the bottom portion 10 of the trouser leg. While two rows of stitching, 23 and 24, are illustrated in the preferred embodiment, the manner of securing the inner portion 20 of the cuff to the trouser leg is up to the individual tailor, and can include stitching, or use of fasteners, such as snap fasteners, or may include securing the cuff to the trousers by means of an adhesive. By securing the inner portion 20 to the inner surface 25 of the trouser leg 11, a neater appearance is given to the finished product, as seen in FIGS. 1 and 5. Of course, it is preferable that any stitching of the portion 20 to the bottom of the trouser leg 10 be spaced below the corresponding periphery of the upper crease 21 so as to be hidden from view by the cuff surface 18. As is customary with men's trousers, the inner surface of the cuff is usually tacked to the bottom portion 10 of the trouser leg, preferably along the inner 14 and outer (not shown) longitudinal seams.

As illustrated in FIGS. 3 and 4, the inner portion 20 of the cuff 17 is secured to the bottom of the trouser leg by a double row 23, 24 of stitching and is integral with the outer surface 18 along the first fold line which defines bottom crease 22 on the cuff. The outer surface 18 is also integral with the inner portion 19 along a second fold line which defines the upper crease 21 on the cuff.

The garment manufacturer treats the trousers made from cellulose fiber-containing fabrics with a known chemical crease-proofing agent. Preferably the trousers are impregnated with a solution, dispersion, or suspension of the agent, the excess agent is squeezed out, and the trousers are dried. After the desired creases are placed in the trousers, they are subjected to sufficient heat and pressure to cure the agent thereon and impart not only durable creases but also wrinkle-resistance, crease-recovery and wash/wear properties thereto. The garment manufacturer also makes separate, individual cuffs for each pair of trousers. The cuffs undergo the same treatment as the trousers, namely, impregnation with a solution, suspension or dispersion of a chemical creaseproofing agent, such as the well-known resin precondensates, including urea-formaldehyde, melamine-formaldehyde, phenol-formaldehyde, cyclic ethylene urea-formaldehyde, polyfunctional epoxies, and the like, in the presence of an acidic catalyst therefor, including magnesium chloride, zinc nitrate, zinc fluoroborate, and similar catalysts. The cuffs may also be impregnated with the equally well-known nonresinous creaseproofing agents which include formaldehyde, dichloropropanol and other similar reactants or mixtures of resins and/or nonresinous agents. Included among the nonresinous agents are the vinyl sulfones and adducts therefor which are applied in an alkaline medium containing alkali metal carbonate or bicarbonate catalysts or other alkaline catalysts suitable for the same purpose. After the formed cuffs are immersed in the resin or nonresin bath, the excess solution is removed, the cuffs dried, and the agent cured thereon by applying heat and pressure, preferably by a hot iron, steam press, etc., so as to form the durable creases 21, 22 along the folded peripheral edges of the cuff 17. To insure adequate curing, the trousers and cuffs may be subjected to higher temperatures for a short period of time so as to complete the reaction between the crease-proofing agent and the cellulose fibers.

Another method for forming the separate cuffs of the invention is to treat the material 26 illustrated in FIG. 2 with the preferred creaseproofing agent and, after removing the excess solution, drying the material. The appropriate folds are then made in the material to form the cuff, as illustrated in FIG. 6, and sufficient heat and pressure are applied to the folded cuff so as to cure the chemical agent and impart a durable crease 21, 22 at the top and bottom of the cuff while at the same time imparting wrinkle-resistance, crease-recovery, and wash/wear properties to the cuff, which properties are identical to those previously imparted to the trousers.

The retailer, after selling a pair of the aforesaid trousers, measures the customer for the correct trouser length and cuts off the excess portion at the bottom of the trouser legs. He then takes the two treated cuffs provided by the manufacturer and secures them by sewing the inner portion 20 of the cuff to the inner bottom surface 25 of the trouser leg, as illustrated in FIG. 6. From an external appearance, the cuff and trouser are integral.

Alternatively, the manufacturer may make the trousers of the same length which he ordinarily makes, uncuffed, for the retail trade, except that cuffs are formed on each leg in any known manner prior to the trousers being treated with a known chemical creaseproofing agent by the manufacturer in the manner described above. In certain instances, the manufacturer may make the trousers from fabric which has been previously treated with a chemical creaseproofing agent, but where the agent is not finally cured thereon until the trousers have been formed. Thus, durable longitudinal creases in the trouser legs and durable creases at the top and bottom peripheral edges of the cuffs are formed. Once the trousers have been sold and the customer has been measured for trouser length, the formed cuffs may be readily severed from the lower end of the trouser legs, the trouser legs shortened to the appropriate length, and the formed cuffs may be readily sewn to the bottom portion of the shortened trouser legs so that the seam does not show and the trousers and cuffs have an integral appearance. By this alternative method, the advantages of the invention are retained, but the disadvantage of perhaps losing or misplacing the separately formed cuffs in transit from manufacturer to the ultimate purchaser is obviated.

In the embodiment of the invention illustrated in FIG. 7, the manufacturer, once the treated cuff is made, applies a thermoplastic film-forming material 27, having wear properties which exceed the wear properties of the cellulose fiber-containing textile, to a portion 28 of the cuff 17, and cures the composition onto the fibers of the material. Included among the thermoplastic film-forming materials useful for the purpose of the invention are the vinyl resins, such as polyvinyl chloride plastisol or organosol, polyvinyl acetate, copolymers of polyvinyl chloride and acetate, and other similar vinyl resin latexes which are colorless and which provide wear-resistant characteristics to the inner rear surface 28 and edge 22 of the cuff 17, as shown in FIG. 7.

While it is well-known that trouser cuffs have a tendency to wear out more rapidly along the front and back marginal edges during use, since these are the principal regions where the cuff comes into contact with the shoe of the wearer, it has not been possible for garment manufacturers to apply any resin coatings to the inner surface of the trouser legs, since the position of the bottom front and rear marginal edges of the cuff will vary with the height of the purchaser. Now, with the cuff of the invention, not only are the identical wash/wear, crease-recovery and wrinkle-resistant properties imparted to the

cuff, but the manufacturer can also apply a wear-resistant resin coating to at least the rear surface portion 28 of the cuff and of rear portion of the crease 22, or, if desired, can place the coating on the front inner portion of the cuff and crease, or can coat the entire inner surface of the cuff 17 and crease 22, thus increasing the life of the cuff.

By use of the above invention, it will be possible for purchasers of trousers formed of cellulose fiber-containing materials, such as cotton, rayon, linen, blends or cotton and/or rayon with other natural and synthetic fibers, including wool, nylon, Dacron, Orlon, and similar polyamide polyester and acrylonitrile polymers and copolymers, to have cuffs thereon which have properties identical to the properties which have been imparted to the trousers by the garment manufacturers, so that the sharp creases formed on the cuffs are substantially similar in appearance and durability to the longitudinal creases on the trouser legs. Dacron and Orlon are the trademarks of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., for its polyester and polyacrylontrile fibers, respectivelly.

Having fully defined the invention, what is claimed is:

1. In combination with a pair of trousers of cellulose fiber-containing material wherein said trousers have been treated with a chemical creaseproofing agent and, prior to curing said agent on said trousers, longitudinal creases are formed along the front and rear of each trouser leg, said longitudinal creases being durable after curing of said chemical agent thereon, said treated trousers having wrinkle-resistant, crease-recovery and wash/wear properties imparted thereto by said chemical creaseproofing agent, a separately formed cuff detachably secured at the bottom of each trouser leg, each cuff comprising an outer face surface and an inwardly and downwardly folded upper portion and an inwardly and upwardly folded bottom portion, said folded bottom portion being secured about its circumference to the bottom portion of said trouser leg, said folded bottom portion and said face surface being substantially parallel to said bottom portion of said trouser leg, said cuff being of the same material as the trouser leg, said cuff, prior to being secured to said trouser leg, having been treated with a chemical creaseproofing agent which was cured thereon after said cuff was formed to impart durable creases to said folded portions, said cuff having the same wrinkle-resistant, crease-recovery and wash/wear properties as said trousers.

2. The article as defined in claim 1 wherein said cellulose fiber-containing material is cotton.

3. The article as defined in claim 1 wherein the inner surface of said cuff has a film of colorless thermoplastic material formed thereon, said film having wear properties which exceed the wear properties of said cellulose fiber-containing textile.

4. The article as defined in claim 3 wherein said film of colorless transparent material is a vinyl resin latex.

5. The method of forming a pair of trousers of cellulose fiber-containing material with cuffs having the same properties as said trousers comprising applying a creaseproofing agent to said trousers, forming longitudinal creases on said trousers and applying sufficient heat and pressure to said trousers to cure said creaseproofing agent thereon and impart wrinkle-resistant, crease-recovery and wash/wear properties to said trousers together with durable longitudinal creases, forming a separate cuff for each trouser leg, said cuffs comprising an outer face surface, an inwardly and downwardly folded upper portion and an inwardly and upwardly folded bottom portion, applying a creaseproofing agent to said cuffs and applying sufficient heat and pressure to said cuffs to cure said creaseproofing agent thereon and impart wrinkle-resistant, crease-recovery and wash/wear properties to said cuffs, together with durable creases about the upper and lower folded peripheral edges of said cuffs, and securing the inwardly and upwardly folded portion of each of said cuffs to the bottom portion of a trouser leg to give the cuff an external appearance of being an integral part of the trousers.

6. In combination with a pair of trousers of cellulose fiber-containing material wherein the fabric of said trousers has been treated with a chemical creaseproofing agent and, prior to final curing of said agent on said trousers, longitudinal creases are formed along the front and rear of each trouser leg, said longitudinal creases being durable after curing of said chemical agent thereon, said treated trousers having wrinkle-resistant, crease-recovery and wash/wear properties imparted thereto by said chemical creaseproofing agent, a cuff separately affixed to the bottom of each trouser leg, each cuff comprising an outer face surface, an inwardly and downwardly folded upper portion and an inwardly and upwardly folded bottom portion, said cuff being secured about its circumference to the bottom portion of said trouser leg, said folded bottom portion and said face surface being substantially parallel to said bottom portion of said trouser leg, said cuff having been previously formed and being of the same material as the trouser leg, the fabric of said cuff having been treated with a chemical creaseproofing agent which was finally cured thereon after said cuff was formed to impart durable creases to said folded portions, said cuff having the same wrinkle-resistant, crease-recovery and wash/wear properties as said trousers.

7. The article as defined in claim 6 wherein said cellulose fiber-containing material is cotton.

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