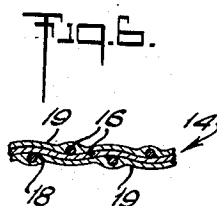
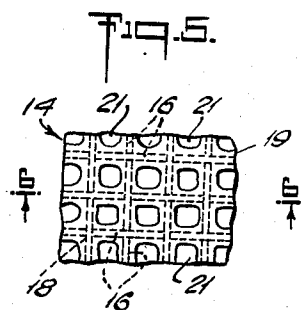
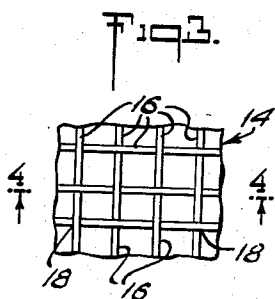
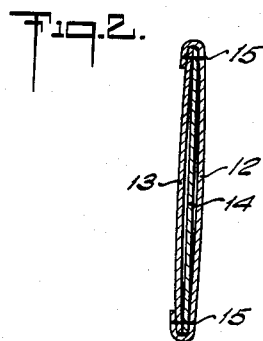
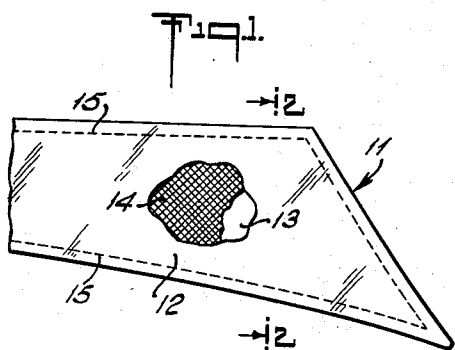


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COLLAR CONSTRUCTION

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COLLAR CONSTRUCTION

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1 Claim. (Cl. 2-143)

1

The present invention relates to nylon wearing apparel and more particularly to wearing apparel constructed in whole or in part of two or more plies of nylon fabric separated by an interliner intended to stiffen the nylon fabric and improve its suitability for the intended purpose. In one of its specific embodiments the invention relates to interliners for nylon shirt collars and cuffs.

Considerable effort has heretofore been directed to the development of interliners suitable for use in constructing nylon shirt collars and cuffs. Principal effort has been directed to the use of interliners made of nylon monofilaments and nylon multifilaments with a view to producing an interliner inherently possessing the same dimensional stability or resistance to distortion during laundering as the nylon outer plies. Thus far, however, the available interliners are characterized by different shrinkage properties than the nylon fabric comprising the outer plies, with the result that the shirt collar puckers after repeated washings. Interliners constructed of nylon monofilaments and nylon multifilaments have not proved entirely satisfactory because of the various difficulties that have arisen with the use of such materials including undesirable dimensional stability characteristics, fraying and shifting of weave during cutting and formed and an inherently high cost.

The primary purpose of the present invention is to provide a low cost interliner for nylon shirt collars and cuffs, the interliner being so designed as to permit its use without resort to heat treatment by the shirt manufacturer and characterized by a high degree of stability as regards shrinkage during washing. Another object is to overcome the fraying and weave-shifting encountered with previous interliners constructed of nylon monofilaments and multifilaments. Other objects and advantages of the invention will be apparent as the description progresses.

I have found that the foregoing objects and advantages may be attained by suitable treatment of cotton fabric of the type conventionally used in the preparation of interliners for cotton shirt collars and cuffs. The invention is based upon the discovery that the shrinkage characteristics of cotton fabrics of this type may be significantly altered by a very simple process with the result that the treated cotton fabric constitutes a satisfactory interliner for nylon shirt collars and cuffs.

By nylon is meant any long-chain synthetic polymeric amide which has recurring amide groups as an integral part of the main polymer

2

chain, and which is capable of being formed into a filament in which the structural elements are oriented in the direction of the length of the filament.

The treatment of the cotton fabric base material referred to above involves the use of soluble nylon. This material is soluble in aqueous alcohol and may be crosslinked or converted to an infusible and insoluble state by heat treatment of the soluble nylon polymer in the presence of known condensation catalysts.

In carrying the invention into practice, I prefer to employ a solution containing the soluble nylon polymer dissolved in aqueous ethyl alcohol. In order to obtain a satisfactory end product, shortly prior to the treatment of the cotton base fabric with the nylon solution, I add to the solution a suitable quantity of condensation catalyst. After the catalyst has been dissolved in the polymer solution, the resulting liquid constitutes the treating fluid for the base cotton fabric, the liquid being applied to the fabric by any suitable means such as immersion, or coating. The resulting coated fabric is then dried at moderate temperature to remove the volatile solvent and water, after which the dried fabric is then exposed to elevated temperatures for the purpose of converting the soluble nylon to an infusible and insoluble state. The resulting coating imparts to the cotton base fabric a dimensional stability surprisingly similar to that of a fabric consisting wholly of nylon monofilaments or multifilaments. In addition, the weave of the resulting fabric is locked and its stiffness is increased, thereby substantially reducing fraying and shifting of the weave during cutting and forming of the fabric into suitable collar interliner blanks.

In order to more clearly disclose the nature of the present invention a specific example will hereinafter be described. It should be clearly understood, however, that this is done solely by way of example for the purpose of illustrating the invention and not for the purpose of delimiting its scope.

Example

A solution was made containing ten to twenty per cent of soluble nylon, dissolved in ethyl alcohol-water (80%-20%) solution. To this solution was added an amount of solid citric acid equal to two per cent by weight of the dissolved polymer. The citric acid was added to the solution while cool and the solution was stirred until the citric acid was dissolved, thereby producing the coating solution.

The resulting coating solution was applied to

3

a cotton fabric (64 x 56, 5.29 yds./lb.), preferably by means of a knife coater. The coated fabric was dried at 82-100° C. temperature until the alcohol and water had evaporated, after which the dried fabric was heated at 120° C. for fifteen to twenty minutes to insolubilize the polymer. The resulting fabric was cut into collar interliner blanks and the latter used in constructing shirt collars having nylon outer plies, using standard well known collar making techniques.

The structure of a typical collar of the invention will be understood from the following additional description taken together with the drawings wherein: Fig. 1 is a partially cut away view of a collar of this invention, Fig. 2 is an enlarged sectional view along the line 2-2 of Fig. 1, Fig. 3 is a magnified view of the basic fabric used for the interliner of the collar of Figs. 1 and 2. Fig. 4 is a sectional view taken along the line 4-4 of Fig. 3. Fig. 5 is a magnified view of an interliner material of the fabric of Fig. 3 after it has been coated with nylon. Fig. 6 is a sectional view along the line 6-6 of Fig. 5.

The collar 11 of the invention comprises the inner and outer nylon collar covers 12 and 13 and the interliner 14, as shown in Figs. 1 and 2. The inner and outer covers may be attached to the interliner 14 and each other by any suitable means such as stitching 15.

In the magnified view of Fig. 3, the threads 16 of the interliner base fabric 14 are shown spaced from and overlapping one another at the thread intersections 18. Figure 5 shows the results of coating the fabric of Fig. 3 with nylon to provide an interliner material. As shown, the nylon coating 19 extends around the individual threads 16 of the fabric, binding said threads together at their intersections 18. The spaces between the threads 16 are sufficiently great to allow the nylon coating to pass around the individual threads and, at the same time, leave openings 21 between the threads.

The interliner obtained by the procedure described in the above example is characterized by several advantageous properties. It may be cut into collar blanks to provide an interliner of significantly lower cost than those made from mono or multifilament nylon. It is more inherently free of distortions which are troublesome to shirt manufacturers. It is stable dimensionally and will not crease to the same degree as monofilament fabrics. The method of introducing the condensation catalyst as a component of the coating solution brings about an

4

improvement which is not obtained by using a washing solution of the acid catalyst after the coating operation. The resulting fabric, as regards shrinking characteristics is substantially the equivalent of an all-nylon fabric made of nylon mono or multifilaments, yet it can be made at a substantially lower cost and is additionally characterized by substantially improved resistance to fraying and shifting of the weave during cutting and forming.

It will be apparent to those skilled in the art that many variations may be made in the procedure described in the foregoing example. Thus for instance, any equivalent condensation catalysts known in the nylon art may be employed in lieu of the citric acid. Likewise, the proportions of materials described in the example may be varied within wide limits. In addition, the preferred base fabric may be replaced by other cotton fabrics of different weave or construction, including for example, non-woven cotton fabrics as well as those made by conventional weaving operations. These and many other variations may be made without departing from the spirit and scope of the invention as defined in the appended claim.

I claim:

A semi-soft shirt collar constructed of laminated material comprising plies of nylon textile fabric between which is interposed a separate interliner comprising a cotton fabric having a nylon coating extending around the individual threads of said fabric binding said threads together at their intersections, said coated threads being spaced to provide openings for the passage of air between them, whereby the weave of the resulting fabric is locked and pervious to air and said interliner possessing substantially the same shrinkage characteristics during washing as those of the nylon plies rather than the shrinkage characteristics of the cotton base fabric from which said interliner was derived.

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