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M. SPERBER

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MULTI-PLY ARTICLE AND METHOD OF MAKING SAME

Filed Aug. 23, 1935

Fig. 1.

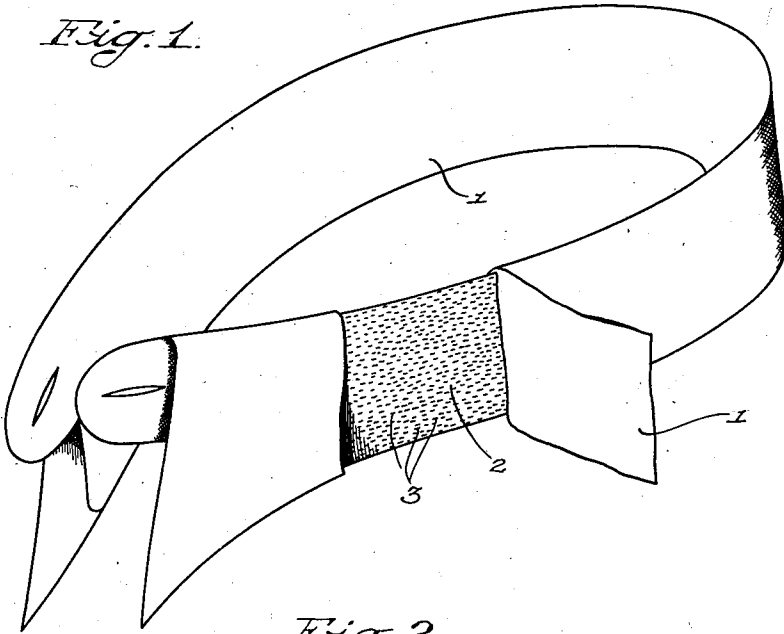


Fig. 2.

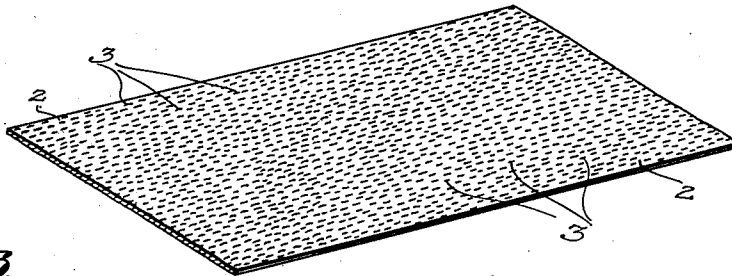


Fig. 3.

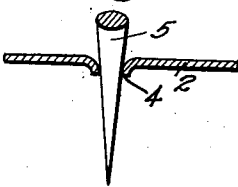


Fig. 4.



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UNITED STATES PATENT OFFICE

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MULTI-PLY ARTICLE AND METHOD OF
MAKING SAMEMeyer Sperber, Philadelphia, Pa., assignor of
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9 Claims. (Cl. 154-2)

My invention relates to an improvement in multi-ply articles, such as collars and other articles of apparel, and to a method of manufacturing such products. More particularly this invention relates to improvements in the type of multi-ply articles of apparel known in the trade as starchless or fused collars and the like.

The principal object of the present invention is to provide a novel multi-ply article which has many advantages, from the standpoint of both manufacture and use, as compared with the products previously available.

Another object of the invention is to provide an improved article of apparel, such as a collar, of the starchless or fused type in which the ply having the cementitious surface coating thereon is characterized by its pervious nature, with accompanying advantages.

A further object of the invention is to provide a novel method of manufacturing a multi-ply structure embodied in articles of the type described.

As the invention is directed particularly to articles of apparel of multi-ply construction, such as collars, cuffs, bosoms, and the like, it will be described with particular reference to this type of product, and more especially to collars, although it likewise pertains to other articles which are subjected to repeated laundering.

In the drawing:

Figure 1 is a perspective view of a collar embodying the invention, a portion of the outer cover cloth being turned back to disclose the lining ply;

Figure 2 is an enlarged perspective view showing the lining material of the invention;

Figure 3 is an enlarged fragmentary sectional view showing one of the pins or punches extending through the lining material; and

Figure 4 is an enlarged fragmentary sectional view of the multi-ply article shown in Figure 1.

It is general practice in the manufacture of collars to assemble multiple plies of fabric which have previously been cut in desired shape and size. A collar so assembled can be divided into its two major parts, namely, the neck-band and the fold-over top. In general practice, both of these major parts are constructed from three plies of fabric; a face ply, an interlining, and a back ply, the neck-band and fold-over top being made up separately, and subsequently stitched together. While there are other processes of manufacturing collars, this method is the one most universally practiced, and the present invention is intended to conform particularly with equipment used to manufacture collars of such general construction, although the

invention contemplates the possibility of eliminating one of the component plies, if desired.

The starchless or fused type of collars now on the market is in general characterized by the use of material associated with the interliner which is water-insoluble and binds the interliner to the cover cloth or cloths. These are of two types, in the first of which the interliner itself is woven of threads of cotton and of a latently cementitious material such as cellulose acetate. This interliner is placed in contact with the cover cloth or cloths and a solvent acting upon the cellulose acetate is applied. When the solvent evaporates, a bond is created between the interliner and the other material.

In the second type, the interliner which may be of the usual cotton fabric or other material employed in starched collars is treated with a cementitious material in plastic condition or in a solvent. The interliner upon being dried has an impervious coating of the material upon its surface. When the treated interliner is assembled with the cover cloth or cloths, a bond is created between the materials by an appropriate step depending on the nature of the cementitious material. If the material is of the type of cellulose acetate or the like, a solvent for the coating is applied and after drying a bonded product is obtained. In the United States Patent No. 2,009,139, granted to Frank R. Redman, July 23, 1935, the use of thermoplastic resinous material as the bonding agent is described, which material is capable of being cementitiously softened at pressing temperatures, but still retains its adhesion at and below the boiling temperature of water. If this type of material is used as the cementitious substance, the bonding of the plies is effected by heat and pressure without the aid of a solvent.

The present invention relates to the fused collars of the second type, that is to say, collars where an interliner coated with a cementitious material is employed in the fabrication of the article. As previously stated, the coating as originally applied at least, is impervious to air and water, and is in fact practically water-proof. When the type of cementitious coating described in the Redman patent is employed, the article becomes pervious after laundering, due to the mechanical action involved, as pointed out in the patent, page 3, column 2, lines 54 to 61. By the present invention, a pervious interliner is provided before fabrication of the article, which in all respects is equal or superior to the impervious coated interliners used previously.

There is a tendency for the collars manufac-

tured from the interliners having the impervious cementitious coating to blister during ironing after laundering with the production of resulting wrinkles in the iron product. This is due to the fact that the vapor evolved during the ironing has no outlet and, therefore, may build up in front of the iron in the form of a blister, it being understood that the collar has been moistened during laundering or prior treatment and that the application of the hot iron or other pressing device to the moistened collar results in the generation of vapor. Some difficulties are also at times encountered in the laundering of the product, since the washing fluids do not permeate the interliner. Such difficulties are more pronounced when the laundering includes a bleaching step with a chemical which must be removed by subsequent treatment. In this case, the final washing may not remove the cleansing materials completely, in which case the article of apparel may ultimately turn yellow.

The continuous film of cementitious material in the interliner imparts stiffness thereto which manifests itself in its paper quality, imparting to the finished article a "crackle" which is considered detrimental by some manufacturers. The lack of flexibility does not lend itself to easy manipulation in the manufacture of collars, particularly in the sewing of the plies together and in turning the points.

In accordance with the present invention, these disadvantageous tendencies are overcome and certain new advantages are imparted to the interliner by perforating the interliner to improve its porosity without in any way destroying the qualities which make it suitable for the purpose for which it is intended. While the untreated interliner may be perforated before coating, provided care is taken during the coating operation to avoid filling the perforations thereof with the coating material, it is recommended that the perforations be formed in the coated interliner. More particularly, the interliner with the continuous coating applied thereto, as taught by the prior art, for example, as taught by the above-mentioned Redman patent, is provided with a multiplicity of minute perforations which extend through the coating and interliner and break up the continuity of the surface coating, thereby rendering the interliner and the products made therefrom flexible and pervious to both air and water, and imparting to the fabric the desirable characteristics mentioned hereinafter.

The interliner is coated with the desired cementitious material in a solvent or in plastic condition, and thereafter it is dried to form the insoluble, impervious coating as is the practice in the art. The cementitious material may be any of the types suitable for the manufacture of starchless or fused collars, for example, cellulose acetate with or without a plasticizer. A thermoplastic resinous material, for example, the mixtures of vinyl resins described in the Redman Patent No. 2,009,139 may also be used. If desired, the interliner may be rendered substantially non-shrinking and non-stretching before the application of the cementitious material, as set forth in the aforesaid Redman patent.

The multiplicity of minute perforations may be formed through the coated interliner by any desired means, for example, by punching or by forcing a number of pins of the desired shape and size through the fabric. In either case, the structure of the interliner will be cut away at the points of perforation. The multiplicity of perforations

may be produced by forcing a plurality of pins through one side of the sheet, in which case the opposite side will have slightly raised portions surrounding the perforations and corresponding to the outline of the pins. Preferably, however, the perforations are formed by forcing a plurality of pins through both sides of the coated sheet alternately, and this may easily be accomplished by passing the coated sheet through rolls, both of which are provided with pins adjusted to perforate the sheet, it being understood that this procedure will result in the formation of slightly raised portions surrounding each perforation and extending from the side of the sheet opposite that penetrated by the pins or punches. The shape and size of the pins or punches may be varied as desired, but since a very large number of minute perforations is to be preferred, the pins or punches will be very small and usually circular in cross-section. The perforations may be produced without any thought of regularity and the number of apertures per unit area may be varied widely. In any event, the coated interliner is provided with a multiplicity of minute perforations, each surrounded by a slightly raised portion of the punched out material, which raised portions extend outwardly from one or both faces of the interliner depending upon whether the perforations are formed by pins or punches forced through one or both sides of the interliner.

In a specific example, a lining fabric of 60-ley of single thirtys cotton and 48 picks of single fortys cotton coated with a thermoplastic resinous material, as described in the above-mentioned Redman patent, is passed through a perforating machine to provide 245 minute perforations per square inch through the lining fabric. The interliner with its latently cementitious but pervious coating is placed between cover cloths or outer plies in the usual method of manufacturing fused or starchless collars, and the assembled multi-ply product is subjected to heat and pressure to create the desired bond between the lining and cover cloths as described in the Redman patent. During the ironing or pressing operation, the slightly raised portion of the interliner which surrounds each perforation and which results from the piercing or punching operation above referred to, is pressed into the corresponding perforation to partially but not completely fill the same, i. e., the material does not completely fill the perforation but leaves a relatively small opening through the interliner at each perforation, which openings are not discernible through the cover cloths but render the product sufficiently pervious to satisfactorily accomplish the objects of the present invention. The small perforations or openings remain in the interliner during repeated launderings but are not apparent in the finished article. In the drawing, the cover cloths are shown at 1, the interliner at 2, with its openings 3. In Figures 3 and 4 the numeral 4 designates the raised portion which surrounds each of the perforations made through the interliner by the pin or punch 5, Figure 3 showing the formation of the raised portion during the piercing or punching operation, and Figure 4 showing the said raised portions after the collar has been ironed or pressed to bond the cover cloth or cloths to the interliner to force the raised portions into the corresponding perforations to partially but not completely fill the same.

In addition to rendering the interlining pervious and flexible with the advantages previously pointed out, an increased bond is afforded be-

tween the cover cloth or cloths and the interliner, due to the fact that the perforations in the lining permit of slight, but invisible, indentations of the cover cloths therein, as shown in exaggeration in Figure 4. Each of the cover cloths is secured to the entire imperforate surface of the interliner and is also keyed to the interliner adjacent the perforations, this keying of the cover cloths at the perforations being due to the fact that there is a slight but not discernible indentation or depression in the surface of the interliner adjacent each opening as shown in greatly exaggerated form in Figure 4 of the accompanying drawings. These indentations or depressions materially assist in preventing slippage of the cover cloths with respect to the interliner. It will be obvious that when the collar is moistened and ironed, the openings 3 will permit the escape of steam or vapor through the collar and that blistering of the cover cloths and resulting wrinkling thereof will be effectively eliminated.

It will be understood, of course, that the invention is susceptible to change or modification as to its details without departing from the scope thereof.

I claim:

1. The method of making an interliner for use in the manufacture of multi-ply articles such as collars or the like which comprises applying to a sheet a coating of latently cementitious, substantially water-insoluble material, and thereafter providing said coated sheet with a multiplicity of perforations each of which is surrounded by a slightly raised portion of the coated sheet, which portion is bendable into its corresponding perforation to partially fill the same.

2. The method of making an interliner for use in the manufacture of multi-ply articles such as collars or the like, which comprises applying to a sheet a coating of latently cementitious, substantially water-insoluble, thermoplastic material, and thereafter providing said coated sheet with a multiplicity of perforations each of which is surrounded by a slightly raised portion of the coated sheet, which portion is bendable into its corresponding perforation to partially fill the same.

3. As an article of manufacture, an interliner for multi-ply articles such as collars or the like, comprising a sheet having a coating of latently cementitious and substantially water-insoluble material thereon and having a multiplicity of perforations extending therethrough with slightly raised portions of said coated sheet surrounding each corresponding perforation and extending outwardly from the surface of said sheet.

4. As an article of manufacture, an interliner for multi-ply articles such as collars and the like, comprising a sheet having a coating of latently cementitious, substantially water-insoluble, thermoplastic material thereon and having a multiplicity of perforations extending therethrough with slightly raised portions of said coated sheet surrounding each corresponding perforation and extending outwardly from the surface of said sheet.

5. In the manufacture of multi-ply articles such as collars and the like, the method which comprises piercing an interliner having a coating of latently cementitious, substantially water-insoluble material thereon to produce a multiplicity of perforations through said coated interliner with a slightly raised portion of the coated interliner surrounding each perforation, assembling said perforated interliner with a cover

cloth, and pressing said assembled multi-ply structure to render said coating material cementitious to bond said cover cloth to said interliner and to force the slightly raised portion surrounding each perforation into its corresponding perforation to partially fill the same so as to leave a multiplicity of small openings through the coated interliner of sufficient minuteness as not to be apparent on the face of the cover cloth.

6. In the manufacture of multi-ply articles such as collars and the like, the method which comprises piercing an interliner having a coating of latently cementitious, substantially water-insoluble material thereon to produce a multiplicity of perforations through said coated interliner with a slightly raised portion of the coated interliner surrounding each perforation, assembling said perforated interliner with a pervious cover cloth, moistening said assembled multi-ply structure, and applying heat and pressure to said assembled multi-ply structure to render said coating material cementitious to bond said cover cloth to said interliner and to force the slightly raised portion surrounding each perforation into its corresponding perforation to partially fill the same so as to leave a multiplicity of small openings through the coated interliner of sufficient minuteness as not to be apparent on the face of the cover cloth, said openings rendering the structure pervious to permit the escape of vapor created therein during the application of heat and pressure to the moistened assembled multi-ply structure, whereby blistering of the material and resulting wrinkling of the cover cloth are eliminated.

7. In the manufacture of multi-ply articles such as collars and the like, the method which comprises piercing an interliner having a coating of latently cementitious, substantially water-insoluble, thermoplastic material thereon to produce a multiplicity of perforations through said coated interliner with a slightly raised portion of the coated interliner surrounding each perforation, assembling said perforated interliner with a pervious cover cloth, moistening said assembled multi-ply structure, and applying heat and pressure to said assembled multi-ply structure to render said coating material cementitious to bond said cover cloth to said interliner and to force the slightly raised portion surrounding each perforation into its corresponding perforation to partially fill the same so as to leave a multiplicity of small openings through the interliner of sufficient minuteness as not to be apparent on the face of the cover cloth, said openings rendering the structure pervious to permit the escape of vapor created therein during the application of heat and pressure to the moistened, assembled multi-ply structure, whereby blistering of the material and resulting wrinkling of the cover cloth are eliminated.

8. A multi-ply article such as a collar or the like including a cover cloth and an interliner therefor, said interliner comprising a sheet having a coating of latently cementitious, substantially water-insoluble material thereon to bond said cover cloth to said interliner when said coating material is rendered cementitious and said coated interliner having a multiplicity of perforations each of which is partially closed by a portion of the surrounding coated sheet which extends into its corresponding perforation to produce a multiplicity of small openings through said interliner of sufficient minuteness

as not to be apparent on the face of the cover cloth.

9. A multi-ply article such as a collar or the like including a cover cloth and an interliner therefor, said interliner comprising a sheet having a coating of latently cementitious, substantially water-insoluble, thermoplastic material thereon to bond said cover cloth to said interliner upon the application of heat and pressure

to said cover cloth and interliner, said coated interliner having a multiplicity of perforations each of which is partially closed by a portion of the surrounding coated sheet which extends into its corresponding perforation to produce a multiplicity of small openings through said interliner of sufficient minuteness as not to be apparent on the face of the cover cloth. 5

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