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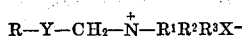
3,409,387

PRESS-FREE GARMENTS AND METHODS OF MANUFACTURE

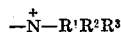
Alex F. Gordon, Black Mountain, N.C., assignor to United Merchants and Manufacturers, Inc., New York, N.Y., a corporation of Delaware
No Drawing. Filed Apr. 15, 1966, Ser. No. 542,756
9 Claims. (Cl. 8—116.2)

ABSTRACT OF THE DISCLOSURE

Process for the production of press-free garments which will retain their crease, which includes the steps of impregnating the fabrics from which the garments are produced with an aqueous solution containing an acetal and a synergistic catalyst, the synergistic catalyst comprising an acid salt of a primary aliphatic amine and a quaternary ammonium salt of the formula:



wherein R is an aliphatic hydrocarbon group containing about twelve to above eighteen carbon atoms, Y is —CONH— or —O—



is an aliphatic tertiary amine or a heterocyclic tertiary amine and X⁻ is a halogen atom or mineral acid radical; and optionally an additional catalyst constituent selected from the group consisting of a salt of (1) a metal of Group II, III or IV of the Periodic Table and (2) an organic acid, which additional constituent will impart a pH of below 7 to the aqueous solution. The impregnated fabric is then dried, cut and sewn to form the desired garment and thereafter cured at an elevated temperature.

This invention relates to textile finishing procedures in general and more particularly to improved processes for the production of press-free, crease-retaining garments and the products produced thereby.

In recent years, various methods have been developed by the art for treating fabrics so as to impart durable crease characteristics to the fabrics. In the early stages of these developments, processes were discovered which resulted in the so-called "wash and wear" fabrics, the products thereof requiring little or no ironing to reset the crease and remove wrinkles after each washing. The standard process for transforming fabrics into "wash and wear" garments comprises generally initial impregnation of the fabric with a thermosetting resin, drying, and then curing the impregnated fabric by heating to effect cross linking of the resin and fibers. Thereafter, the fabric was washed, cut, sewn and pressed to result in the finished garment.

Further developments in the garment industry soon gave rise to improvements or variation over the above-defined general process resulting in the so-called "permanent-press" fabrics. In this later development, the fabrics were subjected to an initial impregnation with a thermosetting resin and then dried, as in the "wash and wear" procedure. However, in the "permanent press" process, the impregnated fabric, after drying is cut, sewn and pressed to form the completed garment, without washing and prior to curing. Thereafter the finished garment is cured by the use of heat to effect setting or cross-linking of the resin with fibers of the finished garment. This process re-

2

sults in the production of garments which retain their press and remain wrinkle-free even after repeated washings.

While the "permanent-press" technique has met with general acceptance in the garment industry, and more importantly with consumers, a number of problems have arisen with its use which have precluded universal acceptance and satisfaction of the garments produced by the process. Foremost among these problems or difficulties is that the procedure has not been found suitable for producing garments composed entirely of cotton, particularly so-called light cottons. While some success has been attained by employing fabrics consisting of heavy cottons, i.e., eleven ounces in weight or more, no process has been developed heretofore which will effect suitable durable crease resistance in fabrics consisting of light cottons.

This problem appears to arise as a result of the thermosetting resins employed heretofore for impregnation of the fabrics as the chemicals employed have affected the tensile strength and durability of the cottons with resultant poor garment wear and discoloration. The resins primarily employed heretofore to impregnate the fabrics, and which have been found deleterious to the cotton, comprise generally the urea-formaldehyde resins, the melamine-formaldehyde resins, certain sulfones and imidazolidones. As pointed out hereinabove, none of these have yielded satisfactory results when working with all-cotton fabrics.

As cotton is one of the most desirable fabrics for garment formation, attempts have been made to circumvent the problems by employing cotton, which is composed of cellulosic fibers, fortified with synthetic fibers such as polyesters and polyamides (nylon). However, it has been found that incorporation of synthetic fibers into cotton in fact does not prevent or eliminate the deteriorative effect of the finish to the cellulosic fibers, but merely serves to mask the deterioration.

A further problem encountered by prior processes is that the extended curing cycles heretofore employed (sixteen minutes or more) have resulted in shade changes of many of the dyed fabrics. This difficulty has been particularly manifest when working with fabrics colored by dispersed dyes as the dye-stuff tends to migrate from the cloth to the wall and other parts of the equipment thus resulting in difficult cleaning and maintenance problems as well as creating shading changes and nonuniform shading. Moreover, these prior processes have not been suitable for producing white cottons by reason of the fact that white garments tend to suffer discoloration and yellowing during the curing operation and subsequent wash and wear period. Another difficulty interrelated to this problem is the expensive equipment required to effect these long curing or setting periods. Another disadvantage resulting from the extended curing cycles of the art is that wash resistance and light fastness properties of the fabric are adversely affected by long, high temperature curing.

Still another disadvantage of processes employed heretofore is that full resin polymerization or cross-linking is not uniformly achieved as the extent and ratio of the inter- and intra-molecular cross-linking is not subject to effective control.

It is accordingly one object of the present invention to provide processes for producing press-free, crease-retaining garments and the products thereof which obviate the disadvantages heretofore incurred by the art.

A further object of the present invention is to provide

an improved process for the production of press-free, crease-retaining garments which retain their durability and tensile strength and are not subject to color variations during production or when subjected to repeated washings during the wear period.

A still further object of the present invention is to provide an improved process for producing garments composed of cellulosic fibers by the impregnation thereof with a special class of acetal resins contained in an aqueous solution wherein brief curing cycles are employed to result in cellulosic fabrics having improved tensile, tear and abrasion strength and durability.

An even further object of the present invention resides in the provision of a process for the production of press-free, crease-retaining garments by the impregnation thereof with a resin-forming aqueous solution of acetals containing a synergistic catalyst, wherein substantially complete resin polymerization or cross-linking is achieved with excellent control.

Other objects and advantages of the present invention will become apparent as the detailed description thereof proceeds.

In accordance with the present invention, and in satisfaction of the above objects and advantages, there is provided an improved process for the production of press-free, crease-retaining garments which comprises impregnating the fabrics with an aqueous solution containing an acetal and a synergistic catalyst, drying the fabric, cutting and sewing to form a desired garment and then curing the garment at an elevated temperature for a short period. Also provided by the present invention are the garment products produced by the novel process.

When proceeding according to the process of the present invention, it has been found that press-free, crease-retaining garments may be produced which do not suffer from the disadvantages of prior garments as enumerated above. It has been found that impregnation of the fabrics with a certain aqueous solution of acetals containing a synergistic catalyst results in the production of garments having a soft, lustrous hand, outstanding strength and durability properties, remain wrinkle-free and are not subject to discoloration either during the curing step or during the wash and wear period.

The novel process of the invention is considered applicable to the several types of fabrics now employed in the textile industry for forming crease-retaining garments including cellulosic and synthetic fibers in general as well as blends of these fibers, such as cotton blended with nylon or polyesters in ratios of about 40% to 60%. However, the present process is considered particularly applicable to fabrics composed solely of cellulosic fibers, sometimes called "all-cottons," and this fabric forms a preferred aspect of the present invention. Even more preferred fabrics for use in the present invention are the light-cottons, or the all-cotton fabrics of less than about eleven ounces in weight. Such light cotton fabrics are eminently suitable for forming garments such as shirts, blouses, and the like, which have not been successfully commercially produced heretofore because of the processing problems enumerated hereinabove.

In carrying out the process of the invention, the selected fabrics are initially treated or impregnated with an aqueous solution containing (A) an acetal or mixture of acetals as hereinafter defined and (B) a synergistic catalyst mixture constituted of (1) an acid salt of a primary aliphatic amine of the following formula:



wherein R is an alkyl or aryl-alkyl group of one to about eight carbon atoms and HX is a strong acid; and (2) a quaternary ammonium salt of the following formula:



wherein R is an aliphatic hydrocarbon having about twelve

to about eighteen carbon atoms which can be normal or branch-chained, Y is $-\text{CONH}-$ or $-\text{O}-$



5 is an aliphatic tertiary amine cation or a heterocyclic tertiary amine cation, such as dialkylaniline, trialkylamine, pyridine, quinoline, picoline, or homologs of these compounds, such as alkyl-pyridines, quinolines, picolines, etc., and X⁻ is a halogen anion, preferably chlorine or bromine or a mineral acid radical.

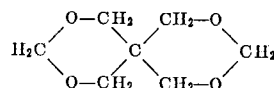
10 This synergistic catalyst mixture may also contain a third (3) catalyst constituent if desired, namely a salt, e.g., a halide, oxyhalide, nitrate, sulfate, etc., of a metal of Group II, III or IV of the Periodic Table, or an organic acid, which constituent functions to impart a pH below 7 to the treating solution. Any such water-soluble metallic salt which, when added to water produces a solution having a pH below 7 may be used. Examples of such salts are the alkaline earth metals, e.g., calcium, magnesium, etc., chlorides, nitrates, bromides, chlorates and iodides; aluminum chloride or sulfate boron fluoride, soluble zinc salts including zinc silico fluoride; and zirconium oxychloride. Also, there may be employed instead of, or in conjunction with the metal salt, an organic acid such as citric acid, monochloro acetic acid, formic acid and the like with similar results.

The acetal employed in forming the above aqueous solution comprises the reaction product of an aldehyde with a glycol or polyglycol containing not more than about six carbon atoms in the glycol molecule, the acetal being produced by reaction at least one mole of the aldehyde per mole of glycol. In a preferred embodiment, at least two moles of aldehyde are reacted per mole of glycol. As a general rule, it is preferred to employ as many moles of aldehyde as there are hydroxy groups in the glycol reactant.

The aldehyde reactant employed for producing the acetal includes any material which will function to donate aldehyde radicals under the conditions of the reaction. Such materials include, in addition to formaldehyde per se, paraformaldehyde and other formaldehyde polymers, as well as acrolein, methacrolein, glyoxal, glutaraldehyde, and the like. The preferred aldehyde is aqueous formaldehyde.

55 The glycols considered applicable for use in forming the acetals of the present invention by reaction with the aldehyde include the well known glycols or polyglycols containing not more than about six carbon atoms in the glycol molecule and comprise such materials as diethylene glycol, ethylene glycol, propylene glycol, trimethylene glycol, dipentaerythritol, tripentaerythritol, etc., as well as glycerol derivatives.

The acetals are prepared by reacting one mole of one of the above defined glycols or glycerols with as many moles of aldehyde as there are hydroxy groups contained in the glycol compound. The preferred acetal for use in forming the aqueous solutions of the invention is pentaerythritol bis acetal of the following formula:



60 The acid salts of the primary aliphatic amine identified generally hereinabove [component (1) of synergistic catalyst mixture (B)] include the acid salts of compounds such as monoethanol amine; butanol amine; ethylamine; 2-amino-1-butanol; 2-amino-2-methyl-1-propanol; 2-amino-2-methyl-1,3-propanediol; 2-amino-2-ethyl-1,3-propanediol, tris(hydroxy-methyl)-amino methane, etc. 65 The strong acids which may be employed to form the acid salts of the above amines include the mineral acids such as hydrochloric acid, sulfuric acid, nitric acid, phosphoric acid and organic acids such as citric acid and the like. The preferred amine salts for use in forming the aqueous solution of the invention is 2-amino-2-methyl-1-

propanol hydrochloride, known commercially as Catalyst AC.

The quaternary ammonium component [component (2) above] includes such compounds as stearamide methyl pyridinium chloride; octadecyl oxymethyl pyridinium chloride, oleyloxymethyl pyridinium chloride, stearamide methyl picolinium chloride, stearamide methyl quinolinium chloride, etc. The preferred quaternary ammonium compound for use in the solution is stearamide methyl pyridinium chloride, sold commercially under the trade name of "Zelan AP," chiefly in view of the fact that it is readily available and relatively inexpensive.

The aqueous treating solution prepared employing the above-identified materials should contain from about 2% to about 16% by weight of the acetal reactant on a basis of 100% acetal and not more than about 10% by weight of the synergistic mixture of catalysts with the catalyst components in the mixture present in approximately equal amounts. When operating with or treating cotton fabrics, a solution containing from about 2% to about 10% by weight of the acetal (100%) should be used. When treating rayon or viscose textiles, the acetal content should be from about 4% to about 16% by weight.

When using an aqueous solution containing only catalyst components (1) and (2) above, the amount of the synergistic catalyst mixture should not exceed about 7% or 8% by weight based on the total weight of the treating solution. Preferably the solution should contain from about 0.5% to about 2% of each of the catalyst components (1) and (2) and if component (3) is also used, as preferred, it is employed in the amount of about 1.5% by weight to about 2.5% by weight of the aqueous solution.

The treating solution may also contain additives such as a small amount, for example, of from 0.1% to about 5% by weight, of a buffer to minimize degradation of cellulose fibers due to the acid catalyst. Examples of such buffers include melamine formaldehyde, triazine urea formaldehyde resins (Aerotex 23), dimethylol ethylene urea, dimethylol dihydroxy ethylene urea, dimethylol propylene urea, dicyandiamide (DCY) and the like. The solution can also contain esters of stearylalcohol and melamine formaldehyde (Permel B sold by American Cyanamid Company) or a mixture of two or more such buffers and from about 0.5% to about 4% of glycerin, glucose or sorbitol which serves to protect the cellulose and acetal in the treating solution during the early stages of the processing while the acetal is chiefly in the liquid phase. The solution may also contain if desired suitable textile softeners as well as suitable deodorants.

The above aqueous solution is formed to serve as a padding or impregnating bath for the fabrics which are ultimately to be formed into garments. In a preferred embodiment, the bath employed for applying the treating solution is prepared by mixing a portion of the water with the acetal and the other constituents are added in solution form to the water-acetal mixture. The quaternary ammonium salt component is preferably added by dissolving in hot water at a temperature of about 160° F. and added to the solution. The remaining constituents, if not soluble in water at room temperature above about 70° F., are dissolved in water at an elevated temperature below the boiling point of the water and added thusly. The temperature of the resultant bath will depend on the particular constituents employed and should be such that all constituents remain in solution. Any temperature below the boiling point of water can be used. As a practical matter, however, temperatures near room temperature or a few degrees above room temperature for example, from 70° F. to about 110° F., should be employed.

In alternative procedures for impregnating the fabrics with the treating solution, the latter may be sprayed, printed, padded or otherwise applied to impregnate the textile with the treating solution. By either treating

method, however, the wet pick-up should be from about 65% to about 85% by weight based on the weight of the dry textile after extraction of the excess solution.

Before the impregnation of any of the fabrics with the aforementioned aqueous solution, it is preferable to thoroughly wash the fabrics in a suitable aqueous soap solution, including a suitable detergent to remove any starch, gelatine, glucose, dextrine, coloring matter or other impurities which may be present, and subsequently rinsing the washed fabrics in clear rinse water. This procedure is deemed necessary to avoid any undue stiffening of the material.

Following application of the treating solution to the fabric at the desired temperature and extraction of the excess solution so that the wet pick-up is from about 65% to about 85% by weight based on the dry weight of the textile, the fabric is dried at a temperature maintained substantially below the temperature required to cure, set or polymerize the resins on the fabric. That is, the polymerization of the resin forming ingredients of the solution, with which the fabric is impregnated, is deliberately avoided in the method of the invention during the stages of padding stretching, finishing and drying. A preferred temperature range for drying the impregnated fabric has been found to be about 200° F. to about 260° F. for a period of from about 0.5 to about 3 minutes.

One embodiment for impregnating and drying the fabrics comprises winding the fabric onto rolls and then successively and continuously impregnating with the above-described aqueous solution by passing the fabric through a conventional dipping or padding machine, stretching and sizing on a standard tenter frame and simultaneously drying as the fabric passes along the frame. Thereafter, the fabric is finally rolled onto a suitable drum for transportation to a garment makeup room where the treated fabric is cut, sewn and finished to provide the completed garment for subjection to the final curing step to effect polymerization of the resins in the garment. If desired the fabric may be double-dipped in the above described aqueous solution to insure approximately 100% pick-up of the solution by the fabric. Extraction of excess solution may be effected by passing the impregnated fabrics through rollers operating under forced pressure so as to result in a wet pickup of about 65% to about 85% based on the dry weight of the fabric.

In the padding or impregnating step including squeezing of the fabric, approximately 65% to 85%, preferably 70% by weight of the solution is retained in the fabric as it leaves the padding machine for passage to the tenter frame for stretching and setting to size such as width. Whenever it is desired to impart a mechanical finish to the fabric, a conventional flat nip calendar can be employed in conjunction with the tenter frame, the rolls of the calendar being heated at the drying temperature to effect the mechanical finish. It is to be understood that the drying atmosphere of approximately 200° F. is to be maintained as the fabric is passed along the tenter frame, such drying atmosphere being substantially below the temperature required to cure, set or polymerize the resins impregnated on the fabric.

The final roller upon which the fabric is rolled after passing through the tenter frame and flat nip calendar, if used, may or may not be heated depending upon the degree of crease resistance desired in the fabric and this is dependent upon the type of fabric being processed. It has been found that heating of this final or take-off roller usually serves to effect an increase in the crease resistance of the treated fabrics. It is preferred also to so control the drying of the solution and impregnated fabrics so as to retain approximately about 2% to about 8% of the solution or moisture content over and above the natural moisture of the fabrics. After completion of the impregnation and drying steps, the entire drum or roller with the processed or impregnated fabric, containing the residual moisture content mentioned, is then transferred

extent and ratio of inter- and intra-molecular cross-links formed as the resin insolubilizes on the cellulose fibers. This feature, in turn makes possible the control of the adverse effect of the acidic catalyst on the cellulose.

The following examples are given to illustrate the process of this invention.

In the following examples, cotton broadcloth was treated with the solutions set forth in the examples. The aqueous solution was at room temperature (70° F.) when the cloth was passed therethrough and after passage through the bits of the padding rollers the fabric was left with a wet pick-up of about 70% based on the fabric weight. The treated cloth was then dried on the rollers at about 200° F.

In Examples 1 to 11, inclusive, the acetal was pentaerythritol bis acetal, employed as a 56% solution in water. In Examples 12 to 19, inclusive, the acetal was triethylene glycol acetal employed as a 54% solution in water and methanol. The percentage values given below represent the percentages by weight of 56% and 54% solutions, respectively, of the acetals based on the total weight of the solution.

The Aerotex employed in the examples was used in the form commercially available containing 48% solids in an aqueous or aqueous/isopropanol medium. The dimethylol-ethylene urea was in the form of a water or water-isopropanol solution containing 48% resin solids. The dimethylol-dihydroxy-ethylene urea was in the form of a 50% aqueous solution containing 50% resin solids. The Zelan was used in a concentration of 50% solids, the rest being water.

Component (1) was Catalyst AC, but the acid salts of any other primary aliphatic amine having six or less carbon atoms such as hydrochloric acid, sulfuric acid, etc., be described above, can be used with similar results. Component (2) is referred to as Zelan, the compound used being stearamide methyl pyridinium chloride, although other quaternary ammonium salts, as hereinabove disclosed, may be used with equal results. All percentages and values given are by weight, based on the weight of the total solution.

In each of the examples, two different cotton fabrics were employed. The first consisted of plain white cotton

by the process of the invention are not subject to discoloration either during the curing operation or thereafter and that the dyed cottons retain their color uniformly without suffering shade changes.

EXAMPLE 1

Component:	Percent
Acetal	16.0
Aerotex	2.0
Glycerine	1.5
DCY	0.25
Catalyst AC	0.5
Calcium chloride	2.0
Zelan	2.0
Water	75.75
Total	100.00

EXAMPLE 2

Component:	Percent
Acetal	16.0
Aerotex	2.0
Glycerine	1.5
DCY	0.25
Catalyst AC	0.5
Calcium chloride	4.0
Zelan	2.0
Water	73.75
Total	100.00

EXAMPLE 3

Component:	Percent
Acetal	16.0
Aerotex	2.0
Glycerine	1.5
DCY	0.25
Catalyst AC	0.5
Zinc silico-fluoride	3.0
Zelan	2.0
Water	74.75
Total	100.00

Example No.	4	5	6	7	8	9	10	11
Pentaerythritol bis acetal	5.0	8.0	12.0	16.0	4.0	6.0	10.0	14.0
Dimethylol Ethylene Urea	5.0				6.0			
Dimethylol Dihydroxy Ethylene Urea		2.0	8.0			6.0		4.0
Glycerin	1.0		1.0			2.0		1.0
DCY	0.2		0.25	0.5				
Catalyst AC	0.5	0.5	0.5	0.5	1.0	1.0	1.0	
Methanol Amine HCl								1.0
Zelan	2.0	2.0	2.0	2.0			2.0	
Magnesium Chloride	2.0	2.0	2.0	2.0				
Zirconium Oxychloride								0.5
Monomagnesium Phosphate								0.3
Pyridinium Methylene bis Oxymethyl chloride					1.0	1.0		1.5
Water	84.30	85.50	74.25	79.00	88.00	84.00	86.50	75.50

Example No.	12	13	14	15	16	17	18	19
Triethylene Glycol Acetal	5.0	8.0	12.0	16.0	4.0	6.0	10.0	14.0
Dimethylol Ethylene Urea	5.0				6.0			
Dimethylol Dihydroxy Ethylene Urea		2.0	8.0			6.0		4.0
Glycerin	1.0		1.0			2.0		1.0
DCY	0.2		0.25	0.5				
Catalyst AC	0.5	0.5	0.5	0.5	1.0	1.0	1.0	
Methanol Amine HCl								1.0
Zelan	2.0	2.0	2.0	2.0			2.0	
Magnesium Chloride	2.0	2.0	2.0	2.0				
Zirconium Oxychloride								0.5
Monomagnesium Phosphate								3.0
Pyridinium Methylene bis Oxymethyl Chloride					1.0	1.0		1.5
Water	84.30	85.50	74.25	79.00	86.00	82.00	86.50	75.50

broadcloth whereas the second was a colored cotton fabric dyed with a dispersed blue dye. The purpose of including both plain white and dyed fabrics in the samples was to illustrate the applicability of the process of the invention to both types of materials according to the above disclosure. The results to be achieved by use of this technique was to show that white garments produced

After impregnation and drying of the cotton fabrics employing the aqueous solutions set forth in the above examples, the treated fabrics were cut and sewn into sport shirts. After formation and low temperature pressing of the shirts, they were subjected to the action of a "hot-head" press for three minutes at 310° F., during which period the setting action of the impregnated resin

11

occurred. After removal from the press, the shirts showed a pleasing soft hand with good wear resistance and dimensional stability. The finish imparted to the garments was found to withstand repeated washings and dry cleanings and required no ironing to retain their original unwrinkled shape and creases.

The shirts produced from the white cotton fabric showed no discoloration or fading at the crease lines or anywhere on the shirts immediately following the curing operation or during the subsequent wash and wear period. The blue shirts formed from the dyed cotton fabric retained their original color uniformly throughout the curing step and wear period thus attesting to the attributes and advantages of the disclosed process.

It will be understood that other impregnating solutions of the type described hereinabove may be employed in the process of the invention with similar results obtaining. Also, the impregnated fabrics may be cut and sewn into other types of garments such as trousers, blouses and the like, as will be obvious to those skilled in the art.

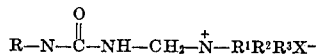
It will be appreciated that this invention is not to be limited to the disclosure set forth hereinabove, but is to be limited only by the appended claims.

What is claimed is:

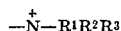
1. A process for the production of press-free, crease-retaining garments which comprises impregnating the fabrics from which the garments are produced with an aqueous solution containing an acetal and a synergistic catalyst, the synergistic catalyst comprising (a) a mixture of a primary aliphatic amine of the formula:



wherein R is an alkyl group having not more than about six carbon atoms and HX is a strong acid, and (b) a quaternary ammonium salt of the formula:



wherein R is an aliphatic hydrocarbon having from about twelve to about eighteen carbon atoms



12

is selected from the group consisting of aliphatic tertiary amines and heterocyclic tertiary amines, and X^- is selected from the group consisting of a halogen atom and a mineral acid radical, drying the impregnated fabric, cutting and sewing to form the desired garment, curing the garment at an elevated temperature and thereafter removing the garment.

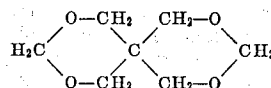
2. A process according to claim 1 wherein the fabric is composed solely of cotton.

3. A process according to claim 1 wherein the acetal is the reaction product of an aldehyde and a glycol.

4. A process according to claim 1 wherein the aqueous solution contains an additional catalyst constituent (c) selected from the group consisting of a salt of (1) a metal of Group II, III or IV of the Periodic Table and (2) an organic acid, which constituent imparts a pH of less than about 7 to the treating solution.

5. A process according to claim 1 wherein the curing step is carried out at a temperature of about 260° F. to about 350° F. for about 2 to 5 minutes.

6. A process according to claim 4 wherein the acetal reactant is pentaerythritol bis acetal of the formula:



7. Press-free, crease-retaining garments as produced by the process of claim 1.

8. A process according to claim 1 wherein the garments are subjected to pressing and/or creasing prior to curing.

9. A process according to claim 1 wherein the fabric is a blend of cellulosic and synthetic fibers.

References Cited

UNITED STATES PATENTS

3,190,715 6/1965 Gordon ----- 8-116

NORMAN G. TORCHIN, *Primary Examiner*.

J. CANNON, *Assistant Examiner*.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

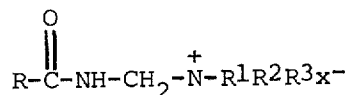
Patent No. 3,409,387

November 5, 1968

Alex F. Gordon

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 8, line 32, "recatant" should read -- reactant --. Column 9, line 11, "bits" should read -- bite --. Column 11, lines 36 to 38, the formula should appear as shown below:



Column 12, line 21, claim reference numeral "4" should read -- 3 --.

Signed and sealed this 10th day of March 1970.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

WILLIAM E. SCHUYLER, JR.

Commissioner of Patents