

UNITED STATES PATENT OFFICE

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WATER AND MOISTUREPROOF TEXTILE MATERIALS

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This invention relates to laminated textile fabrics that are water and moistureproof and also to coated fabrics that are adapted to prevent the escape of odor and taste imparting constituents of the material protected by the treated fabric.

An object of the invention is the production of a fabric that is water and moistureproof yet retains its fabric-texture appearance and flexibility. Other objects of the invention will appear from the following detailed description.

Fabrics treated according to this invention are applicable to such uses as shower bath curtains, pocketbooks, moistureproof bags, tobacco pouches, raincoats, cigarette cases and all similar articles. In appearance the materials retain the structure, color, etc. of the fabric base having, however, a slight glazed appearance not found in the fabric base. These laminated fabrics may be joined, seamed and shaped by cutting and sewing as are ordinary fabrics. These laminated fabrics may be formed into bags and pouches or hemmed by bending in such a manner that at least one treated side of the fabric is contacted in the joint, fold or hem and then merely applying heat and pressure.

According to my invention I laminate a sheeting or foil of an organic derivative of cellulose to an organic derivative of cellulose fabric with or without the aid of an adhesive or a lacquer. If no lacquer or adhesive is used, the two layers of material are welded together by heat and pressure.

The fabric employed may be woven, knitted, knotted, netted, braided or otherwise formed from yarns of organic derivatives of cellulose. The fabric may have thereon designs formed by embossing, printing, dyeing or by employing different types or color of yarns in the forming of the fabric. It is not necessary that all the yarns or filaments be of organic derivatives of cellulose but only that they be found sufficiently distributed in the fabric to form a substantial binding of the foil or sheeting to the fabric.

The yarns or filaments of organic derivatives of cellulose from which the fabric is formed may contain incorporated therewith effect materials such as pigments, filling materials, dyes or lakes, fire retardants, softening agents, sizes and lubricants. Examples of pigments and filling materials are powdered metals, powdered oxides of metals, metallic salts such as the carbonates, logwood, lamp black and organic compounds that are compatible with the organic derivatives of cellulose and that are translucent. Examples of

dyes or lakes are the induline and nigrosine dyes. Examples of fire retardants are beta chlor-naphthalene, triphenyl phosphate and tricresyl phosphate. Examples of softening agents are glycol and glycerol oleates, stearates, etc. and the triethanolamine stearates, oleates, etc. These effect materials may be added to the spinning solution from which the filaments are formed or they may be added to the filaments while the filaments are in a swollen condition due to a treatment with swelling agents such as the thiocyanates of ammonium, sodium, potassium and calcium, dilute phenol, dilute acetone, pyridine ethers and esters of glycols, etc.

The foil or sheeting layer of an organic derivative of cellulose to be applied to the fabric may be of any thickness depending upon the flexibility desired of the product. Foils having a thickness of 0.001 to 0.003" are suitable for this purpose. This foil or sheeting preferably contains plasticizers such as triphenyl phosphate, dimethyl phthalate, diethyl phthalate, triacetin etc. and may also contain coloring materials and like effect materials. The plasticizers may be those that act as solvents for the cellulose derivative at elevated temperatures yet that have no solvent action at ordinary temperatures.

This foil or sheeting is laminated to the fabric by merely superimposing the two and subjecting them to heat and pressure. The temperature and pressure will vary with the type of fabric and thickness of the foil or sheet employed and with the type of organic derivative of cellulose in each. For general use temperatures around 95° C. and a pressure of around 150 lbs. are usually employed.

The temperature and pressure may be reduced and, in some instances, elevated temperature may be entirely dispensed with by employing a lacquer or adhesive between the fabric and foil or sheet. Examples of lacquers that may be employed are those containing nitrocellulose and/or cellulose acetate, phenol aldehyde resin, diphenylol propane aldehyde resin, vinyl resins, casein resin and like substances dissolved in a volatile solvent. If it is desired to avoid coalescence of the organic derivative of cellulose filaments in the fabric as much as possible, the lacquer preferably contains a derivative of cellulose, different from that present in such filaments and having different solubility characteristics, dissolved in any liquid that has little or no solvent power for the organic derivative of cellulose of the filaments. Thus, if the fabric contains yarns of acetone soluble cellulose acetate, the lacquer employed may contain nitrocellulose dissolved in a solvent mixture, com-

prising butyl acetate, that has substantially no solvent action on such cellulose acetate.

The lacquer or adhesive may be sprayed, brushed or smeared upon either the fabric or the formed layer material such as foil and sheeting. The lacquers may be applied to the material from solutions of any degree of viscosity depending upon the mode of application.

The fabric and foil alternatively may be caused to adhere by interposing between them a thin layer of powder comprising an organic derivative of cellulose and plasticizer in intimate admixture and applying heat and pressure to the assembly.

For the purpose of maintaining a cloth-like feel to both sides of the product the moisture-proofing foil or sheet may be sandwiched between two layers of fabric. However, even in the case where the foil or sheet is exposed to view, the texture of the cloth shows through giving the appearance of cloth slightly glazed and does not appear as a laminated fabric. When using foil and welding the fabric thereto by pressure, the foil is embossed with the pattern of the fabric structure, so that the appearance of the assembly of being a laminated fabric is diminished.

For the purpose of producing a textile fabric appearing material that is proofed on both sides the textile fabric may be sandwiched between two layers of foil or sheeting. This structure then consists of a base of sheet material that may be readily cemented to wood, enamelware, etc. a top of sheet material that may be washed easily and a central sheet that imparts a fabric-like appearance to the assembly.

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

1. Method of waterproofing a textile fabric consisting of yarns of organic derivatives of cellulose, which comprises superposing on said fabric a film or foil consisting substantially of an organic derivative of cellulose and subjecting the assembly to a temperature of about 95° C. and a pressure of about 150 pounds to unite the same by direct adhesion and coalescence, while maintaining the fabric character of the base.

2. Method of waterproofing a textile fabric consisting of yarns of cellulose acetate, which comprises superposing on said fabric a film or foil consisting substantially of cellulose acetate and subjecting the assembly to a temperature of about 95° C. and a pressure of about 150 pounds to unite the same by direct adhesion and

coalescence, while maintaining the fabric character of the base.

3. Method of producing a waterproof textile fabric, which comprises interposing a film or foil consisting of cellulose acetate between two layers of fabric containing yarns of cellulose acetate and subjecting the assembly to a temperature of about 95° C. and a pressure of about 150 pounds to unite the same by direct adhesion and coalescence, while maintaining the fabric character of the outer layers.

4. Method of producing a waterproof textile fabric, which comprises interposing a fabric consisting of yarns of cellulose acetate between two layers of film or foil consisting substantially of cellulose acetate and subjecting the assembly to a temperature of about 95° C. and a pressure of about 150 pounds to unite the same by direct adhesion and coalescence, while maintaining the fabric character of the intermediate layer.

5. Method of waterproofing a textile fabric consisting of yarns of organic derivatives of cellulose, which comprises superposing on said fabric a film or foil consisting substantially of an organic derivative of cellulose and a plasticizer therefor and subjecting the assembly to a temperature of about 95° C. and a pressure of about 150 pounds to unite the same by direct adhesion and coalescence, while maintaining the fabric character of the base.

6. Method of waterproofing a textile fabric consisting of yarns of cellulose acetate, which comprises superposing on said fabric a film or foil consisting substantially of cellulose acetate and a plasticizer therefor and subjecting the assembly to a temperature of about 95° C. and a pressure of about 150 pounds to unite the same by direct adhesion and coalescence, while maintaining the fabric character of the base.

7. Method of waterproofing a textile fabric consisting of yarns of cellulose acetate, which comprises superposing on said fabric a film or foil consisting substantially of cellulose acetate and a plasticizer therefor, which plasticizer is a solvent for the cellulose acetate at elevated temperatures, and subjecting the assembly to a temperature of about 95° C. and a pressure of about 150 pounds to unite the same by direct adhesion and coalescence, while maintaining the fabric character of the base.

GEORGE SCHNEIDER.

CERTIFICATE OF CORRECTION.

Patent No. 2,114,320.

April 19, 1938.

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It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 5, claim 3, after "consisting" insert the word substantially; and line 6, same claim, for "containing" read consisting of; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of June, A. D. 1938.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.

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