

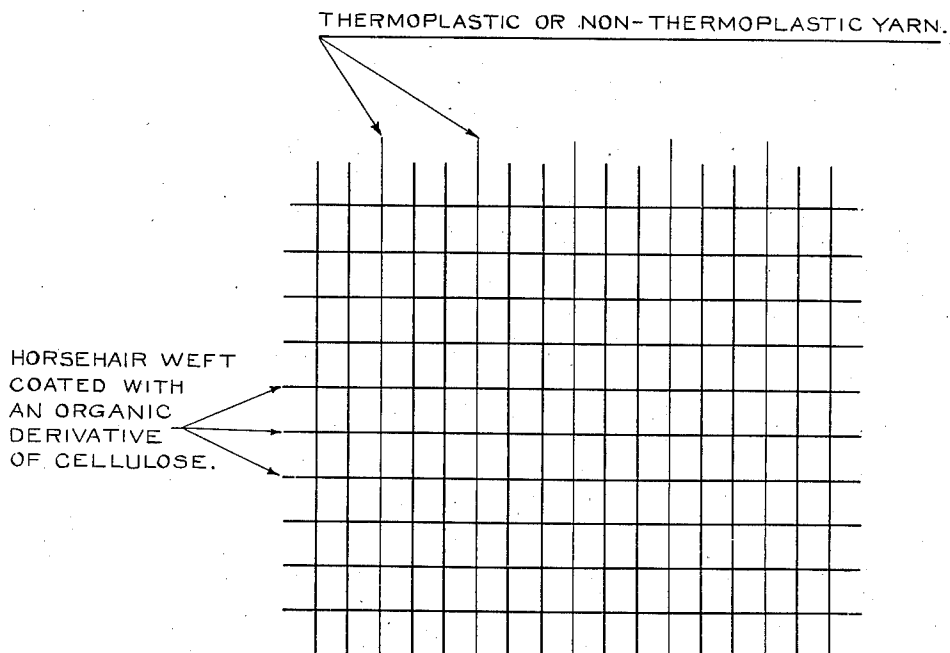
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TEXTILE MATERIAL

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TEXTILE MATERIAL

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This invention relates to the production of textile material, and relates more particularly to the production of stiffening fabrics suitable for use in the manufacture of wearing apparel.

In the manufacture of clothing, for example, coats, overcoats and the like, each forward or front section thereof contains what is known as an inner front which comprises one or more layers of a stiffening material such as hair cloth. These inner fronts of hair cloth were a source of difficulty since they had a tendency to slip after the garment was worn for some time. Furthermore, the hair cloth itself was unsatisfactory since the individual hairs thereof often became loose and worked their way out of the garment thus reducing the efficacy of the hair cloth as a stiffening material.

It is accordingly an important object of this invention to provide an improved stiffening material which will be free from the above-mentioned and other disadvantages.

Another object of this invention is to provide an improved fabric which will not only serve as a stiffening material for garments but which will also maintain the porosity essential to the comfort of the wearer when the fabric is employed in the manufacture of garments.

A further object of this invention is the provision of a hair cloth containing natural horse hair which is firmly and substantially permanently anchored in the hair cloth whereby none of the horse hair is loosened or lost during the life of the garment.

Still another object of this invention is the provision of a process for treating the horse hair prior to the formation of the hair cloth.

Other objects of this invention will appear from the following detailed description.

The figure of the accompanying drawing shows diagrammatically a form of fabric that may be employed in my invention.

In accordance with my invention, an improved hair cloth for use as stiffening material for coats, overcoats and other garments as well as for use in other technical or industrial articles and prepared by employing in the web horse hair which has been coated with a layer of an organic derivative of cellulose. This coating may consist of from 5 to 20% or more on the weight of the hair of an organic derivative of cellulose. After weaving the cloth or even after working the cloth into a garment or other article the cloth is pressed in the presence of steam or treated with a solvent, solvent vapor, or swelling agent for the organic derivative of cellulose, with or without heat, to effect a non-slipping relationship between the hair and the other yarns of the cloth. In some instances, this treatment may be such as to produce an appreciable bond or tacking of the hair to the other yarns of the cloth, while in some instances, although there is a tacking together of

the hair and yarns, the bond appears more as a deformity of the coating on the hair where other yarns cross the same which hold the other yarns and the hair in fixed relationship.

Any suitable type of hair may be employed in forming the hair cloth in accordance with this invention. It is particularly applicable, however, to the horse hair cut from the tail of a horse. These hairs may be straight in the form they are received from the Orient or they may be crimped by passing them between serrated nip rollers or by pressing them between embossing plates, with or without heat and softening agents. If desired, a crimp or indented surface may be impressed upon the hair after it has been coated with the thermoplastic derivative of cellulose in accordance with the teachings of this invention.

The coating applied to the hair may comprise any suitable thermoplastic material such as organic esters of cellulose and cellulose ethers or mixed esters or ether-esters of cellulose. Examples of organic esters of cellulose are cellulose acetate, cellulose propionate and cellulose butyrate, while examples of cellulose ethers are ethyl cellulose and benzyl cellulose. In coating the hair for use in accordance with this invention I prefer to use cellulose acetate which is relatively permanent to washing and dry cleaning. The coating may contain, besides the derivative of cellulose, plasticizers and effect materials the nature and amount of which will vary in accordance with the effect desired, as is well understood in the art.

The plasticizers may be any of the high boiling solvents or softening agents as, for example, the aryl sulphonamides such as para ethyl toluol sulphonamide, the alkyl phthalates such as dimethyl phthalate, the dialkyl tartrates such as dibutyl tartrate, the alkyl lactates such as ethyl lactate, the alkoxy esters of polybasic organic acids such as diethoxy ethyl phthalate, the polybasic esters of the mono alkyl ethers of polyhydric alcohols such as diethylene glycol ether ester of phthalic acid and dimethyl ether of ethylene glycol phthalate, the alkyl esters of phosphoric acid such as triethylglycol phosphate, and the aryl esters of phosphoric acid such as tricresyl phosphate. Mixtures of these plasticizers may be employed. 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.

The coating may be applied to the hair by dipping the same in a solution of an organic derivative of cellulose and removing the solvent, by forcing a solution of the organic derivative of cellulose through a bundle of the hair by means of vacuum and pressure, or the hair may be sprayed with a solution of the organic derivative of cellulose, so that each hair may be individually coated with the organic derivative of

cellulose. A preferred method of applying the coating is to submerge the hair in a solution containing an organic derivative of cellulose, with or without a plasticizer as desired, in a volatile solvent, removing the hair from the solution and evaporating the volatile solvent. In this latter method any tacking together of the hairs during the coating operation may be remedied by rolling the coated hairs to separate them.

The coated hair may be formed into fabrics to produce hair cloth of any suitable nature, as is well understood in the art, the particular weave of the fabric depending somewhat upon the use to which the hair cloth is to be used. The hair cloth may contain yarns of cotton, silk, linen, wool, etc., or it may contain such yarns and yarns containing an organic derivative of cellulose such as cellulose acetate. For instance, the warp may consist of a cellulose acetate yarn of relatively heavy denier, say above 200, then two cotton yarns, and repeating across the width of the warp. The hair may be the sole weft or the weft may consist of doubled hairs, alternate hair and other types of yarn, or two or more picks of hair, then one pick of yarn.

After the hair cloth is woven with the coated hairs, the hair may be anchored therein by pressing the cloth in the presence of steam, ethyl alcohol, acetone-alcohol mixtures or other low boiling softening or swelling agents. The bonding of the yarn may be effected only at the points where the hair crosses a warp yarn or a particular type of warp yarn or a more overall bonding may be effected by subjecting the cloth to a more severe treatment such as by using a medium of stronger solvent action and/or greater heat and pressure.

The following examples are given merely by way of illustration of the process of this invention and are not to be considered as being in any way limitative.

Example I

5 pounds of horse tail hair are distributed evenly over the false bottom of a rectangular vessel, the false bottom being constructed of 100 mesh wire gauze. A solution comprising 10 parts by weight of acetone-soluble cellulose acetate dissolved in 90 parts by weight of a solvent medium containing 5 parts by weight of ethyl lactate, 10 parts by weight of water and 85 parts by weight of acetone is run into the vessel containing the horse hair until the horse hair is submerged by the solution. The horse hair is treated for 15 minutes at 40° C. after which the solution is run off from the bottom of the vessel. Warm air at 50 to 55° C. is then blown gently through the vessel and the horse hair for 10 minutes effecting substantial evaporation of the solvent. Removal of the horse hair from the bath reveals that it is coated with a layer of cellulose acetate.

This coated hair is then woven as weft into a hair cloth employing cotton as the warp. The fabric is then wetted with ethyl alcohol and calendered between heated rolls at light pressure and with the rolls steam heated to 200° C. The coated horse hairs are found to be relatively firmly bonded to the cotton warp.

Example II

The same procedure is followed as in Example I except the warp of the fabric consists of one

end 200 denier cellulose acetate yarn, then 2 ends 20's cotton, and so on across the warp. It is found that the coated hairs are bonded to the cellulose acetate yarns by a strong bond and also bonded to the cotton yarns. An alternative to the employment of cellulose acetate yarns in the warp may be made by employing cotton yarns which have a coating of cellulose acetate thereon.

Example III

The procedure of Example I is followed except that the solution applied to the horse hair contains 5 parts by weight of dimethoxy ethyl phthalate. Hair cloth formed containing this amount of plasticizer need have no alcohol or other solvent applied to the cloth during the pressing operation, the heat and pressure being sufficient to effect a bonding of the hair to the warp yarns. In this particular case the temperature of 320° C. on the calender rolls produces excellent bonding.

It is to be understood that the foregoing detailed description is merely given by way of illustration and that many variations may be made therein without departing from the spirit of my invention.

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

1. A stiffening fabric for use in wearing apparel or other technical and industrial articles comprising a woven fabric having a weft containing horse hair individually coated with an organic derivative of cellulose, said organic derivative of cellulose coating forming a bonding material.

2. A stiffening fabric for use in wearing apparel or other technical and industrial articles comprising a woven fabric having a weft containing horse hair individually coated with cellulose acetate, said cellulose acetate coating forming a bonding material.

3. A stiffening fabric for use in wearing apparel or other technical and industrial articles comprising a woven fabric having a weft containing horse hair individually coated with cellulose acetate and a plasticizer for said cellulose acetate, said plasticized cellulose acetate forming a bonding material.

4. A stiffening fabric for use in wearing apparel or other technical and industrial articles comprising a woven fabric having a warp containing non-thermoplastic yarns and a weft containing horse hair individually coated with an organic derivative of cellulose, said warp and weft being substantially permanently bonded together.

5. A stiffening fabric for use in wearing apparel or other technical and industrial articles comprising a woven fabric having a warp containing non-thermoplastic yarns and a weft containing horse hair individually coated with cellulose acetate, said warp and weft being substantially permanently bonded together.

6. A stiffening fabric for use in wearing apparel or other technical and industrial articles comprising a woven fabric having a warp containing cotton yarns and cellulose acetate yarns and a weft containing horse hair individually coated with cellulose acetate, said warp and weft being substantially permanently bonded together.

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