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TEXTILE YARN FINISH

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This invention relates to the finishing of textile fibers, filaments and yarns, and more particularly to an improved finish composition for fibers, filaments and yarns of regenerated cellulose and the like.

In preparing for subsequent processing such as dyeing, twisting, etc., it is customary to coat the freshly spun yarn with a finish composition. This finish composition may contain one or more mineral oils, drying oils, vegetable oils, wetting agents, anti-static agents, sizes and many other materials. This composition is usually an aqueous emulsion or dispersion of the desired constituents.

This finishing is used to prevent abrasion or breaking during subsequent processing to counteract static charges, to facilitate dyeing and many other purposes. The composition is selected according to the desired result.

It has been found that when a mineral oil aqueous emulsion is used to prevent abrasion or breaking of the yarn and the yarn is subsequently processed into a fabric and dyed, barré may be present.

Therefore, it is an object of this invention to prevent the occurrence of the barré.

It is a further object of this invention to provide an improved finish composition for fibers, filaments and yarns.

Another object of this invention is to provide an aqueous, oil emulsion which will prevent the formation of barré in fabrics made from regenerated cellulose fibers.

Still another object is to treat regenerated cellulose fibers, filaments and yarn with an improved finish to insure improved processing and yarn of improved quality.

These and other objects will become apparent from a reading of the following detailed description.

It has unexpectedly been found that if a stearic acid ester of ethylene oxide and 2,2'-methylenebis (4-methyl-6-tertiary-butyl phenol) are used in conjunction with an oil to form an aqueous mineral oil finish, there is a substantial reduction if not complete elimination of barré. In addition, yarn abrasion and breaking was prevented by the use of this finish.

The aqueous oil finish may be any one of the usual aqueous emulsions containing mineral, vegetable and/or animal oils, sulfonated oils, anti-static agents, etc., which have previously been used in the finishing of textile fibers, filaments and yarns. The preferred composition is a mineral oil aqueous emulsion. The mineral oil will usually be a white oil having a Saybolt Universal viscosity of 85 seconds and be in a concentration of from 49–86.5% by weight of the total composition. Water in 0.5–2% concentration by weight of the total finish composition may be added for clarity of the finish composition. The finish composition is then added to water in an amount sufficient to yield a finish concentration of from 0.5–20%. The preferred concentration is between 0.65–1.0%.

The stearic acid ester of ethylene oxide is prepared by reacting 1.235 parts by weight of ethylene oxide with one part of stearic acid in the presence of 0.3% sodium methylate as catalyst. The final product contains polyoxyethylene chains of varying lengths with the average being about 7.4. The final product may be represented by the formula: $C_{17}H_{35}COO(C_2H_4O)_xH$, wherein x averages 7.4. Other esters may be used such as those wherein x is any number from 3–12.

The amount of the stearic acid ester that is used may vary from 13% to 50% by weight of the total finish composition. The preferred amount is 15%. If less than 13% is used a suitable emulsion cannot be obtained. If more than 50% is used the increased improvement in the results is not sufficient to warrant the increase in the ester.

The remaining constituent of this improved finish is 2,2'methylenebis (4-methyl-6-tertiary-butylphenol). This compound is sold commercially under the name AC–5 by the Catalin Corporation. This compound will be used in amounts of from 0.05–5% by weight based on the stearic acid ester, the preferred amount being 0.5%. This will give the desired result and keep the cost of the finish within its proper range.

In order to illustrate more fully the nature of the present invention, the following example is set forth, it being understood that this description is presented by way of illustration only and not as limiting the scope of the invention.

Example

150 denier, 40 filament regenerated cellulose yarn cakes were prepared in a conventional manner and subjected to normal purification. These cakes were sorted into two groups, one to be coated with a conventional mineral oil finish, and the other to be coated with the finish of this invention. A dilute aqueous emulsion containing about 0.75% finish composition was prepared, which composition contained the following components:

	Percent
White oil (Saybolt viscosity, 85 seconds)	84.0
$C_{17}H_{35}COO(C_2H_4O)_xH$, wherein x averages 7.4	15.0
2,2'-methylenebis (4-methyl-6-tertiary-butyl phenol) (based on the weight of the stearic acid ester)	0.5
Water	1.0

An equal volume of the conventional finish and the above described finish were passed through an equal number of cakes. The cakes were subsequently dried and the yarn was further processed for use as filling in an acetate warp. No barré was evident after scouring and dyeing in those treated with the above composition, whereas those treated with the conventional finish exhibited moderate to heavy barré. The coefficient of friction was obtained for each group and it was found that the above composition reduced the same.

It was observed that the above described composition was nonstaining, exhibited a desirable degree of dispersibility in water, and was light in color. In addition, the finish composition was very stable. This is in contrast to other finishes which yellow the yarn, are difficult to disperse in water and are unstable.

It will be apparent from the foregoing that this invention not only enables the production of yarn that when subsequently processed is free of barré but enables the production of yarn of improved quality with the attendant reduction in costs. Although this invention has been described in connection with the production of regenerated cellulose yarn, it will be obvious to those skilled in the art that it may be applied to other textile materials such as cellulose acetate, cuprammonium celluose, cellulose ethers or other cellulose derivatives, nylon, polyesters, polyacrylonitrile, etc.

While specific embodiments have been set forth in the foregoing description, it will be apparent that many changes and modifications may be made therein without departing from the spirit and scope of this invention and it is intended that the same be limited only by the following appended claims.

What is claimed is:

1. In the process of finishing textile filaments of or-

ganic, filament forming material wherein the freshly formed filament is coated with an oil-containing, aqueous finish composition, the improvement comprising incorporating in said finish a stearic acid ester of ethylene oxide and 2,2'-methylenebis (4-methyl-6-tertiary-butyl phenol).

2. A process according to claim 1 in which the stearic acid ester of ethylene oxide is $C_{17}H_{35}COO(C_2H_4O)_xH$, wherein x averages 7.4.

3. A process according to claim 1 in which the stearic acid ester of ethylene oxide is added in an amount of 13–50% by weight of the oil-containing, aqueous finish.

4. A process according to claim 1 in which the 2,2'-methylene-bis (4-methyl-6-tertiary-butyl phenol) is added in an amount of 0.05–5% by weight of the stearic acid ester.

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