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CELLULOSIC SPINNING SOLUTIONS CONTAINING ALIPHATIC SILICON COMPOUNDS

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8 Claims. (Cl. 106—40)

The present invention relates to a process of preparing cellulosic spinning solutions from which soft-lustre products, such as filaments, yarns, ribbons, films, etc., may be produced.

The primary object of my invention has to do with the incorporation of alkyl derivatives of monosilane acid (HSiO.OH) into cellulosic spinning solutions, such as viscose and cuprammonium cellulose, which will yield upon extrusion or molding soft-lustre products of pleasing hand.

Another object of my invention has to do with the admixture of silicoacetic acid with viscose and cuprammonium cellulose solutions.

A third object of the present invention has to do with the incorporation of silicopropionic acid into viscose and cuprammonium cellulose solutions.

A fourth object of my invention has to do with the incorporation of silicobutyric acid into the aforementioned spinning solutions.

A fifth object of this invention relates to the manufacture of novel, soft-lustre products per se containing alkyl derivatives of monosilane acid.

Other objects of my invention will become apparent to those skilled in the art after a study of the following specification.

In the early days of rayon manufacture, the demand was entirely for yarns having the highest degree of lustre. Later, when it was found that highly lustrous rayon too clearly indicated its origin—an artificial fibre—a demand arose for artificial silk which more closely approximated to natural silk. The earliest attempt to meet the demand of dull-lustre viscose, for example, was a method of retaining sulphur particles in the fibres by discontinuing the normal desulphurizing step during its manufacture. Although this yarn showed decreased lustre, due to scattering of light by the sulphur particles, it was impermanent and exhibited an unattractive "bloom". This method has been improved by dispersing, instead of sulphur, fine inorganic or organic particles and globules in cellulosic spinning solutions, for example, pigments, hydrocarbons, oils, etc. When inorganic compounds, such as titanium dioxide, silica, etc., are dispersed in cellulosic spinning solutions, they tend to cut the thread guides through which they are led during the extrusion process, and in addition they weaken cellulosic yarns considerably. Hydrocarbons, emulsified with spinning solutions to deluster cellulosic products obtained therefrom, have the great disadvantage of being inflammable, while vegetable oils become rancid and form skin-irritating acids.

I have, unexpectedly, found that alkyl derivatives of monosilane acid, having the formula HSiO.OH, possess properties which render them especially suitable as delustering agents for rayon products, since they are practically fire-resistant and do not form irritating decomposition products. The following table depicts a number of such derivatives of monosilane acid which may be used in combination with viscose and cuprammonium cellulose solutions.

Table

Derivatives of HSiO.OH, having the structure R.SiO.OH, in which R represents an alkyl radical.

Silicoacetic acid
Silicopropionic acid
Silicobutyric acid
Silicocaproic acid

and higher molecular derivatives of HSiO.OH.

In addition, I have found that other derivatives of monosilane acid may be used for the purposes, set forth above, such as orthosilicoacetic acid-triethylester, orthosilicopropionic acid-trimethylester, orthosilicopropionic acid-triethylester, orthosilicobutyric acid-trimethylester, orthosilicobutyric-triethylester, orthosilicocaproic acid-trimethylester, orthosilicocaproic acid-triethylester, etc. In other words, I may use fatty acid esters of alkyl derivatives of monosilane acid.

Example

About 1 to 20% of an alkyl derivative of monosilane acid, or an ester of an alkyl derivative of monosilane acid is dispersed in and/or emulsified with a cellulosic spinning solution, such as viscose and cuprammonium cellulose, the aforementioned percentage being based upon the cellulose content of the solution. After uniformly distributing the delustering agent in the spinning solution, it is extruded through suitable spinning nozzles into a conventional spinning bath Organic solvents, inorganic or organic pigments, etc., may be added to the spinning solutions in addition to the silicon compounds. The amounts of these aliphatic silicon derivatives to be added to the cellulosic solutions may be varied at will. In this manner more or less delustered rayon products may be obtained.

Modifications of my process will readily be recognized by those skilled in the art, and I desire to include all those modifications falling within the scope of the appended claims. In these

claims, the term "aliphatic silicon compound" is limited to such compounds which are substantially water-insoluble and resistant to attack by acids and alkalis of such concentrations conventionally used in the rayon art.

I claim:

1. A spinning solution for the manufacture of soft-lustre products comprising a solution of the group consisting of viscose and cuprammonium cellulose and silico-acetic acid, said acid being stable in said solution.

2. As a new article of manufacture, regenerated cellulose containing a small amount of silico-acetic acid.

3. A spinning solution for the manufacture of soft-lustre products comprising a solution of the group consisting of viscose and cuprammonium cellulose together with a silicon compound having the structure R.SiO.OH in which R represents an alkyl radical, said compound being stable in said solution.

4. A spinning solution for the manufacture of soft-lustre products comprising a solution of the group consisting of viscose and cuprammonium cellulose together with a silicon ester, said ester being produced by causing a mono-atomic aliphatic alcohol having the structure R.OH in which R represents an alkyl radical to react with a silicon derivative having the structure R.SiO.OH in which R represents an alkyl radical, said ester being stable in said solution.

5. A spinning solution for the manufacture of soft-lustre products comprising a solution of the group consisting of viscose and cuprammonium cellulose together with a silico-propionic acid.

6. As a new article of manufacture, regenerated cellulose containing a small amount of a silicon compound having the structure R.SiO.OH in which R represents an alkyl radical, said compound being finely dispersed throughout said cellulose.

7. As a new article of manufacture, regenerated cellulose containing a small amount of a silicon ester, said ester being produced by causing a mono-atomic alcohol having the structure R.OH in which R represents an alkyl radical to react with a silicon derivative having the structure R.SiO.OH in which R represents an akyl radical, said ester being finely dispersed throughout said cellulose.

8. As a new article of manufacture, regenerated cellulose containing a small amount of a finely dispersed silico-propionic acid.

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