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METHOD OF SIZING ARTIFICIAL FIBERS

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This invention relates to a method of sizing and more particularly to a method of sizing fibers, threads, or filaments having a cellulose derivative, such as an ether or ester, as a base.

Prior to this invention it has been the common practice to size artificial fibers having a cellulose derivative as a base with benzol or toluol solutions of sizing materials. These solutions are inflammable and, in addition thereto, are quite expensive. Accordingly, it is desirable to use or employ an aqueous solution or emulsion for sizing. If fibers having a cellulose derivative as a base are sized in the same manner as cotton, artificial silk formed of regenerated cellulose, or wool, it is found that very little sizing remains on the fibers. In fact, the quantity of sizing remaining on the fibers is insufficient to give them the desirable cohesion necessary in the weaving operation to which they are destined.

I have found that I can satisfactorily size fibers, threads or filaments having a cellulose derivative as a base with an aqueous sizing solution or emulsion by subjecting the fibers, threads or filaments to the combined action of a sizing materal and a swelling agent, the swelling agent serving to modify the said fibers, threads or filaments to permit satisfactory application and adhesion of the size thereto.

It is, therefore, an object of this invention to provide a method of sizing fibers, threads or filaments having a cellulose derivative as a base with an aqueous solution or emulsion of a sizing material.

Another object of this invention is to provide a method of sizing fibers, threads or filaments having as a base a cellulose derivative which comprises subjecting said fibers to the combined action of a swelling agent and a sizing material, the swelling agent serving to modify the said fibers, threads or filaments to permit satisfactory application and adhesion of the size thereto.

Other objects will become apparent from the following description and appended claims.

To attain the above objects, skeins of artificial silk are introduced or immersed in a solution or emulsion which contains a swelling agent for the cellulose derivative comprising the fibers, threads or filaments. After removing the excess of the swelling agent, the swelled fibers, which retain an appreciable quantity of the solution in which they were submerged, are introduced into an aqueous sizing solution. Upon the removal of the fibers from the sizing bath, the treated fibers are subjected to the usual finishing operations.

Instead of immersing the artificial silk in a solution or emulsion containing a swelling agent and then in the sizing solution, the artificial silk may be submerged, after a preliminary wetting with water, in a sizing bath containing the swelling agent. After removal from the bath, the treated silk is finished in the usual manner.

If the artificial silk is in the form of warp threads, the process constituting this invention may be carried out in the usual slashing machines.

Various materials may be used as swelling agents. I have found that solutions of formaldehyde, acetone, acetic acid, formic acid, pyridine, phenol, salicylic acid, alkaline sulfocyanide, aniline, furfurol and the like, emulsions or suspensions of solvents of cellulose ethers or esters in water or in soap solutions produce satisfactory results.

If it is desired to increase the suppleness of the treated fibers, threads or filaments, materials, such as soap, oil and the like, may be added to the sizing bath in any suitable quantity.

The sizing materials used are generally subject to mold or decay. Accordingly, by adding to the sizing bath a small quantity of any well-known disinfectant, such as boric acid, salicylic acid, phenol, and the like, the sizing solution may be preserved.

In order to more clearly explain the invention the following examples are given. It is to be understood that these examples are merely illustrative and not limitative of the invention.

Example I.—One kilogram of cellulose acetate silk in skeins is immersed in an aqueous solution containing 20% of ammonium sulfocyanide for one hour at approximately 25° to 30° C. Upon the removal of the skeins from this bath, they are rinsed, wrung and plunged into a bath containing 5% of gum arabic in which is emulsified 1% of cocoanut oil and .01% of boric acid. After remaining in this bath for one hour, the skeins are wrung and dried in the usual manner.

Example II.—One kilogram of cellulose acetate silk, previously wetted in warm water, is immersed in a solution containing 3% of gelatin, 0.25% of dextrin, 1% acetic acid, and 0.5% of sulphonated castor oil at 60° C. for approximately fifteen minutes. After wringing and drying, the cellulose acetate silk is found to be sized and is ready for weaving.

Since various modifications may be made in the above-described methods without departing from the nature of the invention, this invention is not limited to the specific details above set forth, except as defined in the following claims:

I claim:

1. A method of sizing artificial fibers, threads or filaments formed of a cellulose derivative of the class consisting of organic acid esters and ethers for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises subjecting said fibers, threads or filaments to the combined action of a swelling agent and a sizing material, the swelling agent serving to modify the material under treatment to permit satisfactory application and adhesion of the size thereto, and drying the treated material.

2. A method of sizing artificial fibers, threads or filaments formed of a cellulose derivative of the class consisting of organic acid esters and ethers for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises subjecting said fibers, threads or filaments to the combined action of a swelling agent and an aqueous solution containing a sizing material, the swelling agent serving to modify the material under treatment to permit satisfactory application and adhesion of one size thereto, and drying the treated material.

3. A method of sizing artificial fibers, threads or filaments formed of a cellulose derivative of the class consisting of organic acid esters and ethers for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises subjecting said fibers, threads or filaments to an aqueous solution containing a swelling agent and a sizing material, the swelling agent serving to modify the material under treatment to permit satisfactory application and adhesion of the size thereto, and drying the treated material.

4. A method of sizing artificial fibers, threads or filaments formed of a cellulose derivative of the class consisting of organic acid esters and ethers for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises wetting said fibers, threads or filaments with water, immersing the wetted materials in an aqueous solution containing a swelling agent and a sizing material, the swelling agent serving to modify the material under treatment to permit satisfactory application and adhesion of the size thereto, and drying the treated material.

5. A method of sizing artificial fibers, threads or filaments formed of a cellulose derivative of the class consisting of organic acid esters and ethers for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises treating said fibers, threads or filaments with a swelling agent and then with a sizing material, the swelling agent serving to modify the material under treatment to permit satisfactory application and adhesion of the size thereto.

6. A method of sizing artificial fibers, threads or filaments formed of a cellulose derivative of the class consisting of organic acid esters and ethers for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises treating said fibers, threads or filaments with a swelling agent and then with an aqueous solution containing a sizing material, the swelling agent serving to modify the material under treatment to permit satisfactory application and adhesion of the size thereto.

7. A method of sizing artificial fibers, threads or filaments formed of a cellulose derivative of the class consisting of organic acid esters and ethers for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises subjecting said fibers, threads or filaments to the combined action of a swelling agent and a sizing material, the swelling agent being of the class which consists of solutions of formaldehyde, acetone, acetic acid, formic acid, pyridine, phenol, salicylic acid, alkaline sulfocyanides, aniline, furfurol, and emulsions or suspensions of solvents of cellulose ethers or esters in water or in soap solutions, said swelling agent serving to modify the material under treatment to permit satisfactory application and adhesion of the size thereto, and drying the treated material.

8. A method of sizing artificial fibers, threads or filaments formed of a cellulose derivative of the class consisting of organic acid esters and ethers for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises subjecting said fibers, threads or filaments to the combined action of a swelling agent and an aqueous solution containing a sizing material, the swelling agent being of the class which consists of solutions of formaldehyde, acetone, acetic acid, formic acid, pyridine, phenol, salicylic acid, alkaline sulfocyanides, aniline, furfurol, and emulsions or suspensions of solvents of cellulose ethers or esters in water or in soap solutions, said swelling agent serving to modify the material under treatment to permit satisfactory application and adhesion of the size thereto, and drying the treated material.

9. A method of sizing artificial fibers, threads or filaments formed of a cellulose derivative of the class consisting of organic acid esters and ethers for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises subjecting said fibers, threads or filaments to an aqueous solution containing a swelling agent and a sizing material, the swelling agent being of the class which consists of solutions of formaldehyde, acetone, acetic acid, formic acid, pyridine, phenol, salicylic acid, alkaline sulfocyanides, aniline, furfurol, and emulsions or suspensions of solvents of cellulose ethers or esters in water or in soap solution, said swelling agent serving to modify the material under treatment to permit satisfactory application and adhesion of the size thereto, and drying the treated material.

10. A method of sizing artificial fibers, threads or filaments formed of a cellulose derivative of the class consisting of organic acid esters and ethers for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises wetting said fibers, threads or filaments with water, immersing the wetted materials in an aqueous solution containing a swelling agent and a sizing material, the swelling agent being of the class which consists of solutions of formaldehyde, acetone, acetic acid, formic acid, pyridine, phenol, salicylic acid, alkaline sulfocyanides, aniline, furfurol, and emulsions or suspensions of solvents of cellulose ethers or esters in water or in soap solutions, said swelling agent serving to modify the material under treatment to permit satisfactory application and adhesion of the size thereto, and drying the treated material.

11. A method of sizing artificial fibers, threads or filaments formed of a cellulose derivative of

the class consisting of organic acid esters and ethers for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises treating said fibers, threads or filaments with a swelling agent and then with a sizing material, the swelling agent being of the class which consists of solutions of formaldehyde, acetone, acetic acid, formic acid, pyridine, phenol, salicyclic acid, alkaline sulfocyanides, aniline, furfurol, and emulsions or suspensions of solvents of cellulose ethers or esters in water or in soap solutions, said swelling agent serving to modify the material under treatment to permit satisfactory application and adhesion of the size thereto.

12. A method of sizing artificial fibers, threads or filaments formed of a cellulose derivative of the class consisting of organic acid esters and ethers for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises treating said fibers, threads or filaments with a swelling agent and then with an aqueous solution containing a sizing material, the swelling agent being of the class which consists of solutions of formaldehyde, acetone, acetic acid, formic acid, pyridine, phenol, salicylic acid, alkaline sulfocyanides, aniline, furfurol, and emulsions or suspensions of solvents of cellulose ethers or esters in water or in soap solutions, said swelling agent serving to modify the material under treatment to permit satisfactory application and adhesion of the size thereto.

13. A method of sizing artificial fibers, threads or filaments of cellulose acetate for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises wetting the cellulose acetate material with water, immersing the wetted material in an aqueous solution containing gelatin and acetic acid, the acetic acid serving to modify the material under treatment to permit satisfactory application and adhesion of the size thereto, and drying the treated material.

14. A method of sizing artificial fibers, threads or filaments of cellulose acetate for the purpose of imparting thereto the cohesion and other characteristics desirable in the weaving thereof which comprises immersing the cellulose acetate material in a solution of ammonium sulfocyanide, removing the excess solution, and then immersing the material in a bath containing gum arabic.

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