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PROCESS OF PREPARING RUBBER-COATED ARTIFICIAL FILAMENTS

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4 Claims. (Cl. 18—54)

This invention relates to a method for forming filaments, yarns, and ribbons comprised of synthetic filament-forming material having a sheathing of latex rubber. More particularly it relates to a method for forming a filamentary cellulosic structure having a sheathing of latex rubber.

Rubber-coated yarns have been prepared heretofore by passing preformed threads in contact with a dispersion of rubber latex and coagulating the latex thereon. Such processes are expensive in that a plurality of steps are involved, and furthermore the yarns or threads formed are often unsatisfactory in that the latex covering does not always adhere to the core as well as desired, and the rubber sheath surrounds a plurality of filaments and not individual filaments.

An object of this invention, therefore, is to provide a simple, inexpensive method of forming latex rubber sheathed artificial filaments wherein the two materials are well anchored to each other and admirably suited to the formation of yarns, ribbons, and the like which are in turn perfectly adapted to the various uses to which yarns, filaments, and the like of this general type have heretofore been applied. A further object is to provide a simple and inexpensive method for forming artificial filaments of cellulosic material sheathed with latex rubber. A still further object resides in a simple and inexpensive method for forming cellulose acetate filaments having a well anchored sheathing of latex rubber. These and other objects will more clearly appear hereinafter.

The above recited objects are accomplished by my invention which comprises the extrusion of a coagulable solution of artificial filament-forming material into a dispersion of rubber latex under such conditions that mutual coagulation of the core- or filament-forming material and sheath-forming material simultaneously takes place. Preferably the core material is a solution of cellulosic filament-forming material, for example, a cellulose acetate solution in acetic acid or a cellulose acetate solution in acetone containing an acid coagulant, which is extruded into an alkaline latex, or the cellulosic solution may be of alkaline character such as viscose in which case it must be extruded into an acid latex.

The concentration of the cellulosic spinning solution may vary quite widely depending on the specific filament-forming substance, the character of the product desired and various other factors as are apparent to one skilled in the art. In the case of cellulose acetate dissolved in acetic acid, a concentration of about 10–15% cellulose acetate is preferred. In the case of viscose, a much lower concentration such as 6 or 8% cellulose is to be preferred.

Natural rubber latex or synthetic rubber latex may be used. In general, the dispersion of latex should contain about 2% to 10% of solids. Where an acid latex bath is to be used, it may be prepared in accordance with any one of the following patents, U. S. Patents Nos. 1,699,368, 1,699,369, or 1,823,119. Where a strongly acid solution or dispersion of latex is desired, the process of U. S. Patent No. 1,823,119 is preferred. The alkaline latex may be that commonly referred to as "ammonia preserved latex" or otherwise suitably prepared to have the desired alkalinity.

To further illustrate my invention, the following example is given. Percentages are by weight.

Example

A solution comprised of 15% cellulose acetate (about 54% combined acetic acid), 80% acetic acid, and 5% water was spun at room temperature through a multi-hole spinneret into a 5.5% dispersion of natural rubber, ammonia-preserved latex in water also maintained at room temperature. A smooth sheath of latex rubber surrounded each filament.

It is obvious, of course, that the viscosity of the latex, the composition of the latex, the addition of various compounding ingredients such as accelerators, vulcanizers, stabilizers, dispersing agents, etc., the rate of extrusion of the cellulosic filament-forming material, and the rate of withdrawal of the yarn from the latex bath, the length of bath travel and the method of drying the latex enveloped yarn may be varied as desired. Further, the latex may contain a specific coagulant for the cellulosic material such as an amine. In the spinning of relatively fine multifilament structures, it will be found desirable to incorporate in the latex an anti-sticking agent, for example glycerin, triethanolamine or the like. In the spinning of a monofil, this precaution will, of course, be unnecessary.

I claim:

1. A process of preparing artificial cellulosic filaments having a coating of rubber which comprises extruding a coagulable solution containing a cellulosic filament-forming material and a coagulant for a rubber latex into a dispersion comprising the rubber latex and coagulant for the cellulosic material whereby to form filaments

having a solid core of cellulosic material and a sheathing of rubber.

2. A process of preparing rubber-coated filaments of cellulose acetate which comprises spinning a coagulable solution comprising cellulose acetate and a coagulant for a rubber latex into a dispersion comprising the rubber latex and a coagulant for cellulose acetate whereby to form filaments having a solid core of cellulose acetate and a sheathing of rubber.

3. A process of preparing rubber-coated filaments of viscose which comprises spinning a coagulable solution comprising viscose and a coagulant for a rubber latex into a dispersion comprising the rubber latex and a coagulant for viscose whereby to form filaments having a solid core of regenerated cellulose and a sheathing of rubber.

4. A process of preparing rubber-coated filaments of cellulose acetate which comprises spinning a coagulable solution of cellulose acetate in acetic acid into a dispersion of rubber latex in water whereby to form filaments having a solid core of cellulose acetate and a sheathing of rubber.

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