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IMPREGNATION OF TEXTILE MATERIALS

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1 Claim. (Cl. 91—68)

This invention is for improvements in or relating to the impregnation of textile materials in the form of laps, slivers, slubbings, rovings, yarns or threads or in the form of manufactured or semi-manufactured articles. It has already been proposed, for example in specification Serial No. 443,470, to impregnate textile materials with an aqueous dispersion of unvulcanized rubber, the rubber introduced into the fibres being subsequently subjected if desired to a vulcanizing process. In certain processes it is desirable that the textile material after impregnation with an aqueous rubber dispersion should not be subjected to such conditions of temperature and pressure as are necessary to effect the vulcanization of the rubber and in such cases it is desirable to provide a process whereby the rubber or like vulcanizable elastic or plastic substance is introduced into the textile fibres in the already vulcanized state. Moreover in carrying out the impregnation process, the presence of suspended sulphur, accelerators and activators (necessary in order to carry out subsequent vulcanization) may be disadvantageous, but if a vulcanized rubber dispersion is used in impregnation this difficulty is avoided. Again, much time may be saved by avoiding vulcanizaton after impregnation and there is no danger of deterioration of the textile material such as may arise from faulty vulcanization.

The present invention accordingly consists in a process for the manufacture of textile materials impregnated with rubber which comprises introducing under pressure into the textile material an aqueous dispersion of vulcanized rubber (hereinafter referred to as vulcanized latex), the textile material being first subjected if desired to the action of a vacuum. In one preferred form of the invention the textile material is subjected to more than one treatment with vulcanized latex and if desired between successive treatments the latex is removed and the textile material subjected to vacuum. Alternatively the textile material may be subjected to vacuum immediately before the first and after the last treatment with latex. According to a modified form of the invention the textile material is immersed in vulcanized latex in a closed vessel and vacuum and pressure are applied alternately with or without removal of the latex from the vessel.

The viscosity of the vulcanized rubber latex and the pressure applied thereto may be so adjusted that the latex is forced between and completely surrounds the individual fibres of the textile threads.

The invention further comprises a process in which prior to the treatment of the textile material with vulcanized rubber latex the textile material is first impregnated with an unvulcanized rubber dispersion.

In cases where the textile material is first treated with an unvulcanized rubber dispersion this may subsequently be coagulated and vulcanized, if desired prior to subjecting the material to impregnation treatment with the vulcanized latex.

In one preferred form of the present invention the vulcanized latex is introduced in two or more stages and if desired the properties of the successive latex baths may be varied so as to obtain in successive layers rubber differing in properties.

Preferably the impregnation with the vulcanized latex is carried out at pressures between a vacuum of 28 inches of mercury and a pressure of 100 lbs. per sq. inch and at ordinary atmospheric temperatures.

Under certain conditions of impregnation it may be desirable to guard against any tendency to premature coagulation of the vulcanized latex and/or to improve the capacity for impregnation. When this is the case any of the well known stabilizing and/or wetting agents such as casein, glue, soaps, sulphonated alcohols, cholates and the like may be added.

The vulcanized latex employed in the present process may be prepared for example by any of the processes disclosed in specifications of Patents Nos. 1,443,149, 1,682,857, and the properties of the latex may be modified as desired by the addition of wetting agents, pigments, fillers, anticoagulants or substances reacting chemically and beneficially with the vulcanized latex. It is also within the scope of this invention to employ mixtures of vulcanized and unvulcanized latex or latex which has been only partially vulcanized. After impregnation the textile material may be subjected to such processes as bring about the coagulation of the latex. If desired, the impregnation with vulcanized latex may be carried out in conjunction with processes similar to those described (for the use of unvulcanized latex) in patent specifications Serial Nos. 640,126, 640,128 and 648,311 and any suitable alternative or additional preliminary treatment may also be used. The process may also be applied to mineral textile materials such as asbestos, slag wool and the like.

Following is a description by way of example of one method of carrying the present invention into effect. Cotton yarn wound on bobbins is treated with vulcanized latex in apparatus of the

type described in specification Serial No. 443,470 after a preliminary keir boiling and treatment with any of the well known wetting-out agents which assists the subsequent impregnation with the vulcanized latex.

The impregnating process is carried out by subjecting the bobbins in the closed vessel to a vacuum of 28 inches of mercury, then introducing vulcanized rubber latex (prepared by the process described in specifications Nos. 1,443,149 or 1,682,857) into the closed vessel so as to cover the bobbins and subjecting the latex to a pressure of 100 lbs. per square inch for 15 minutes. The latex is then withdrawn and vacuum again applied and this sequence of operations is repeated twice. The bobbins are then subjected to vacuum to remove excess of vulcanized latex and are subsequently removed from the closed vessel and subjected to a process of maturing similar to that described in specification Serial No. 640,128 and the yarn subsequently wound off through a coagulating bath consisting of dilute acetic acid is dried and rewound.

I claim:

A process for the manufacture of textile materials impregnated with rubber which comprises subjecting a textile material in the form of a yarn easily permeable to liquid first to treatment with a wetting agent, then to vacuum, then to immersion in a bath of vulcanized rubber latex at ordinary atmospheric temperature and under a fluid pressure of the order of 100 pounds per square inch and subsequently maintaining the impregnated yarn in a humid atmosphere containing ammonia gas, the impregnated yarn being moved in the said atmosphere so as to prevent drainage therefrom of excess of the rubber dispersion.

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