

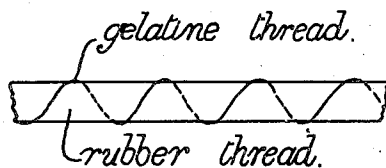
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RUBBER PROCESS AND PRODUCT

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RUBBER PROCESS AND PRODUCT

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8 Claims. (Cl. 18—54)

This invention relates to elastic rubber threads or yarns and their use in the manufacture of textile fabric, knitted or lacework and the like or parts thereof.

When rubber threads are led into a loom or knitting machine so as to be formed into a fabric it is very often difficult to control the rubber threads because of the extensive and variable stretch that they possess and the result of this is that the fabric when completed has a non-uniform surface appearance or that shirring or other defects are present in the finished material.

The object of the invention is to overcome this disadvantage and for this purpose to provide an improved rubber thread which is relatively inextensible during the weaving or knitting into a fabric, and which can be treated when in the fabric so as to render it relatively extensible.

The invention will now be described by way of example, it being understood that the nature of the invention will be specified in the accompanying claims.

In carrying the invention into effect in one form by way of example a rubber thread is wound in an ordinary doubling, twisting or winding machine with a strip of gelatine in the form of a thread or filament with about six turns per inch. The gelatine is then caused to adhere by passing the yarn through steam and subsequently drying.

The accompanying drawing shows an enlarged view of a rubber thread with a gelatine thread wound thereon. The thread is then incorporated as desired in the fabric, giving a flat fabric which is then boiled and washed until the gelatine is removed.

The rubber threads regain all their extensibility, and can contract if they are incorporated in the fabric in a stretched condition.

The winding referred to in the above example will reduce the extensibility of the rubber thread, the more so as the pitch of the windings is increased. It will not, however, in general be advisable to reduce the number of windings per inch below about two, since otherwise there will be danger of the strip not evenly accompanying the thread during the weaving or other process. I have found that about six turns per inch is satisfactory for normal thickness of rubber thread.

Instead of being in the form of a thread or filament, the gelatine may be a band, and its effect in reducing extensibility will be increased as the width of the band is increased; it will be found advisable, however, not to have the strip of too great width, since the flexibility of the thread may be undesirably reduced. For normal thick-

nesses of rubber thread, i. e. .02" diameter, the band might be from .01" to .08" in width, when the number of turns per inch is 10. It is possible to use such a width and pitch in conjunction that the gelatine entirely covers the rubber thread, the coils overlapping one another, and in a modification of the invention the step of treating with steam may be omitted in such a case.

The treatment with steam may result in the fusion of adjacent bands of gelatine and fusion may also be arranged to take place by the treatment with steam of a thread so closely covered with a helical winding of gelatine thread that adjacent coils are in contact. The result is a covered or coated rubber thread with considerable uniformity in the covering or coating and a closely predetermined thickness of such covering or coating.

The thread to which the gelatine is applied may contain gelatine or like extensibility reducing agent. The thread may therefore itself become to a greater or less extent tacky during the steaming, and it may alone, or in addition, be so rendered tacky before winding.

The winding may take place before the thread is dried after its formation.

The thread to which the gelatine is applied may be progressively stretched to render it temporarily non-elastic or may be coated with an adhesive for the same purpose. In the case of a coating it may if suitable be rendered tacky alone, or in addition, before winding.

Instead of gelatine, related bodies such as the glues may be used. These, or the gelatine, may for example after winding be treated or may be compounded with hardening agents, such as aluminium sulphate, formaldehyde and tannic acid, to make the thread more resistant to moisture, with softeners such as glycerine to make it more pliable and with known diluents such as sucrose. The wound rubber thread or the gelatine yarn itself may for example after winding be treated externally with solutions of hardeners; for example, ammonium bichromate in alcohol to make it less susceptible to humidity. Besides glue and gelatine, agar-agar and water soluble cellulose ethers may be used, and other suitable substances, such as resins, for example, vinyl resin, and rubber derivatives, for example, rubber hydrochloride. Instead of steam or in conjunction therewith, suitable processes, depending upon what is necessary to render the substance of the winding tacky, sticky, or adherent, may be used for ensuring that the gelatine or the like adheres firmly to the rubber thread; for example, benzol or

solvent naphtha for the treatment of vinyl resin and rubber hydrochloride.

The invention is not limited to "rubber" in the narrow sense, but includes threads also of balata, gutta-percha, synthetic rubber and other extensible and elastic materials. In the same way the wood "latex" includes aqueous dispersions of such materials.

I claim:

10 1. A method of rendering rubber thread relatively inextensible consisting in winding a soluble inextensible thread about the rubber thread, causing the said soluble thread to adhere to the rubber thread by treating the same with a solvent for the soluble thread, and drying the rubber thread thus treated.

15 2. A method as claimed in claim 1 in which the soluble thread winding consists of gelatine and the solvent therefor is water.

20 3. A method of rendering rubber thread relatively inextensible consisting in winding a soluble inextensible thread about a rubber thread in which an extensibility-reducing agent has been incorporated during manufacture, causing the soluble thread to adhere to the rubber thread by treating the same with a solvent for the soluble thread, and drying the rubber thread.

4. A method of rendering rubber thread rela-

tively inextensible consisting in applying to rubber thread in a freshly formed and still moist state, a winding of a water soluble thread to cause adhesion of the soluble thread to the rubber thread, and subjecting a thread to a drying operation.

5 5. A method of rendering rubber thread relatively inextensible consisting in applying thereto a coating of a water soluble extensibility-reducing agent and applying to the said coating while in a tacky condition a winding of soluble inextensible thread, and subjecting the rubber thread to a drying operation.

6. A relatively inextensible rubber thread composed of rubber upon which is wound and adhered a thread of gelatine.

7. A method of rendering rubber thread inextensible consisting in winding thereon an inextensible soluble flat thread so that the convolutions are in contact with one another, treating the rubber thread thus wound with a solvent for the flat thread so that the convolutions adhere to one another and to the rubber thread, and drying the latter.

8. A method as claimed in claim 7 in which the flat thread is gelatine and the solvent therefor is water.

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