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PROCESS FOR TREATING FABRIC
CONTAINING RUBBER THREAD

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This invention relates to the manufacture of fabrics containing rubber thread and concerns processes I have discovered it advisable to carry into effect after cloth or fabric has left the loom for example.

The object of the invention is to ensure that fabrics manufactured for example as hereinafter explained will maintain or attain physical properties such as flatness and uniformity of breadth in the strip, during processes which occur after the fabric has been manufactured.

The manufacture above referred to is one preferably involving the use of threads having a setting agent such as glue or gelatin incorporated in the substance of rubber or rubber-like threads, which setting agent is to be removed from the rubber or rubber-like threads of the woven fabric in order to restore their comparative elasticity. Reference may be made to British Patents numbered 447,972, 448,098, 449,314, 459,434, and 467,083.

The invention consists in a process of treating fabric comprising rubber or rubber-like threads such as those having a setting agent incorporated in the substance of the rubber or rubber-like material from which the thread is made, in which the fabric is held under tension during part or the whole of the vulcanisation step thereby obtaining a finished fabric which is flat, free from puckers and perfectly elastic.

Also according to various forms of the invention the rubber thread from which the fabric is to be made, may be of the type disclosed in said British Patent 459,434, viz., a thread treated by coating a vulcanized or unvulcanized thread under a desired degree of stretch, for instance 20–25%, with a suitable kind of water-soluble adhesive consisting for example of glue, gelatine (equal parts by weight in water), etc. The coating may be applied and allowed to dry to such a degree that the resulting thread is deprived of its elasticity or resilience.

The invention also consists in a process as described in the preceding paragraph in which when a setting agent is used the removal of the setting agent is effected at the same time the rubber is being partly or wholly vulcanised under tension.

Other features of the invention are hereinafter fully described and claimed in the appended claims.

The rubber threads used are preferably those made according to the specifications mentioned above, but threads similar to the above in which the setting agent or agents have been rendered

insoluble in water, e. g. as described in British Patent No. 449,462, may be used, or threads with no or only a very small percentage of setting agent. The tension may be exerted either across the width or along the length of the fabric or both ways, depending on the manner in which the rubber thread has been incorporated.

In carrying the invention into effect in one form by way of example, cloth is woven with the weft composed of rubber threads set at 50 per cent. elongation in the manner described in British Patent No. 447,972. The cloth is taken from the loom and wound dry round a perforated hollow roller in such a way that the selvage edges lie immediately over one another. Only sufficient tension is used to make the layers of cloth lie flat upon the roller. The piece is then tied down with bands at each end and in the centre in such a way that the cloth is unable to shrink when placed in the vulcanising bath. The latter consists of a vat of boiling water and the wrapped roller is totally immersed in this for one hour, which time is sufficient to vulcanise the rubber present and to remove the greater part of the setting agents. When the fabric comes into contact with the water of the vulcanising bath the threads of rubber tend to shrink to their original length. This shrinkage is prevented by the fact that the cloth is bound down and subsequently the rubber remains in a state of tension throughout the period of vulcanisation. Completely to remove all setting agents, the fabric is washed, after the vulcanisation, in tepid water for an hour. The finished fabric will be found to be flat and free from puckers and perfectly elastic.

In carrying the invention into effect by way of a second example a cloth is woven with an all unstretched set rubber weft. The cloth is passed to a stentering frame which is so adjusted that the loom width is stretched 25 per cent. The cloth in this stretched condition slowly passes through hot water which not only effects vulcanisation, but completely desets the rubber thread. The cloth is finally dried and batched.

By way of illustration of the application of this invention to the manufacture of very close and dense elastic fabrics the following further example is given: A fabric is woven with an all rubber weft, the thread used being unvulcanised rubber thread set with 150 per cent. elongation. This thread when dry possesses little or no elasticity, but when brought into contact with warm water shrinks to its original length. The fabric is passed through a similar stentering machine to that used in the second example, except that

the clips are set to a width of only 75 per cent. of the width of the loom the fabric was woven on. Thus, if the loom width was 42 inches, the clips would be set to 31.5 inches. As the cloth passes into the hot water it tends to retract more than 10.5 inches, but the clips limit it to this amount and the thread in the weft is thus vulcanised under tension. The width of the finished fabric will be 31.5 inches and will appear to be much more closely woven than before vulcanising and desetting.

I claim:

1. Process for producing a smoothly-lying and closely woven elastic fabric from stretched and unvulcanized rubber thread containing a soluble extensibility-reducing agent to prevent retraction of the thread, which comprises: treating said fabric with a solvent for said agent in the presence of heat to remove the agent and vulcanize the thread, while limiting retraction of said fabric.

2. Process for producing a smoothly-lying and closely woven elastic fabric from stretched and unvulcanized rubber thread containing a soluble extensibility-reducing agent rendering the thread inelastic, which comprises: weaving the thread into a fabric, and thereafter treating with a heated solvent to remove said agent and vulcanize said thread, while limiting retraction of said fabric.

3. Process for treating a fabric woven from stretched and unvulcanized rubber thread containing an extensibility-reducing agent which renders said thread inelastic and which is soluble in aqueous solution, said process comprising: treating the fabric in the presence of heat with an aqueous solvent to remove said agent and to vulcanize the thread, while limiting retraction of said fabric.

4. Process for producing a smoothly-lying and

closely woven elastic fabric from stretched and unvulcanized rubber thread containing an extensibility-reducing agent, soluble in aqueous solution, which renders said thread inelastic, said process comprising: weaving the thread into a fabric, and thereafter treating with an aqueous solvent in the presence of heat to remove said agent and vulcanize the thread, while limiting retraction of said fabric.

5. The method of treating fabric formed at least partly of thread including unvulcanized rubber accompanied by a soluble setting agent acting to reduce the elasticity of said thread, which comprises: subjecting said fabric to treatment with a hot solvent for vulcanizing said thread therein while the fabric is under tension and for dissolving said agent.

6. Process for producing a smoothly lying and closely woven elastic fabric from unvulcanized rubber thread, which comprises: stretching said thread prior to weaving, applying a setting agent to said thread for retaining same in stretched condition, then weaving said thread into a fabric while in such stretched condition, and thereafter vulcanizing said fabric under tension.

7. The process of producing flat, smoothly-lying elastic fabric which consists in making such fabric out of yarn composed of rubber in a vulcanizable condition and which, by the use of a setting agent, has been rendered inelastic in an extended condition for fabric-making purposes, such yarn being capable of being rendered elastic and thereby caused to contract by the action of a liquid solvent on the setting agent, and subjecting the fabric so made to the action of such solvent, hot, the temperature of such solvent and the duration of its action being of such degree as to vulcanize the rubber in the fabric.

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