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TREATMENT OF YARNS OR CORDS COMPRISING CELLULOSE FILAMENTS

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2 Claims. (Cl. 28—59.5)

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Our invention relates to the treatment of yarns or cords comprising cellulose filaments, particularly the cords employed in the fabrication of pneumatic tire casings.

It is known to increase the tensile strength of a yarn or cord comprising cellulose filament by wetting the said yarn or cord and allowing it to elongate under tension while being subjected to the action of steam.

The extent to which a cotton cord which has been treated by such a process stretches under a given weight is less than that of the untreated cord under the same weight. The diminution in capacity for stretching of the treated cord is moreover greater, the greater the extent to which the cord has, during the treatment, been allowed to elongate under tension.

Cord of very low extensibility may be objectionable for some industrial operations; if, for example, a raw tire structure comprises plies of rubberized cotton cord of very low extensibility defects may be developed in the tire produced from the structure during the final moulding-vulcanising operation.

It is the object of the present invention to impart increased extensibility to cotton yarns or cords which have been allowed to elongate under tension while being subjected to the action of steam and, at the same time retain all, or a great part, of the increased tensile strength conferred on the yarns or cords by such treatment.

According to this invention a process for treating yarns or cords comprising cellulose filaments comprises wetting the said yarn or cord, elongating the wetted yarn or cord by the application of a load while subjecting the said yarn or cord to the action of steam, and submitting the elongated yarn or cord to a further steaming operation while applying a load less than the aforesaid elongating load to the said yarn or cord.

The load applied to the yarn or cord while retraction takes place is small and is considerably less than that applied to the yarn or cord to elongate it. For example the load under which retraction takes place may be not more than 1% of the load applied to elongate the yarn or cord.

The degree of retraction in the yarn or cord is controllable by variation of the load applied while retraction takes place.

The degree of retraction is moreover substantially the degree of increase in potential extensibility induced by the treatment.

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The table hereunder records comparative determinations of tensile strength and extensibility on untreated 3/5/22 8's corded cotton, the same cord treated according to the above referred to known process, and the same cord treated according to the invention.

The treatment of the cord is indicated briefly in the left hand column of the table. "Break-lb. wt." denotes the tension in lb. wt. required to break the cord and is an index of the tensile strength; "E_{10}—%" denotes the percentage extension of the cord under a tension of 10 lb. wt. and is an index of the capacity of the cord for stretching.

Table

	Cord conditioned in atmosphere of 70% R. H. at 65° F.		Cord dry	
	Break, lb. wt.	E_{10}—%	Break, lb. wt.	E_{10}—%
Untreated	19.7	14.7	16.1	11.6
Stretched in steam under tension of 7 lb. wt.	22.2	3.8	21.5	3.8
Stretched in steam under tension of 2 lb. wt.	20.2	9.0	16.8	6.0
Stretched in steam under tension of 7 lb. wt. and then relaxed in steam under very low tension	21.6	8.2	19.4	8.1

From the results recorded in the last series of the table it is to be observed that the present process gives a cotton cord with an extensibility which does not vary greatly according to the moisture content of the cord. Cotton cords possessing this property are particularly useful as the textile material of the cord fabric employed in the building of pneumatic tire casings.

Having described our invention, we claim:

1. A process for treating yarns consisting of cotton filaments which comprises wetting said yarn, elongating the wetted yarn by a tension load while subjecting said yarn to the action of steam and thereafter subjecting the elongated yarn to steam while applying a load substantially less than the elongating load of the prior steaming operation.

2. The process of claim 1 in which the load applied during the second steaming operation is substantially negligible.

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