

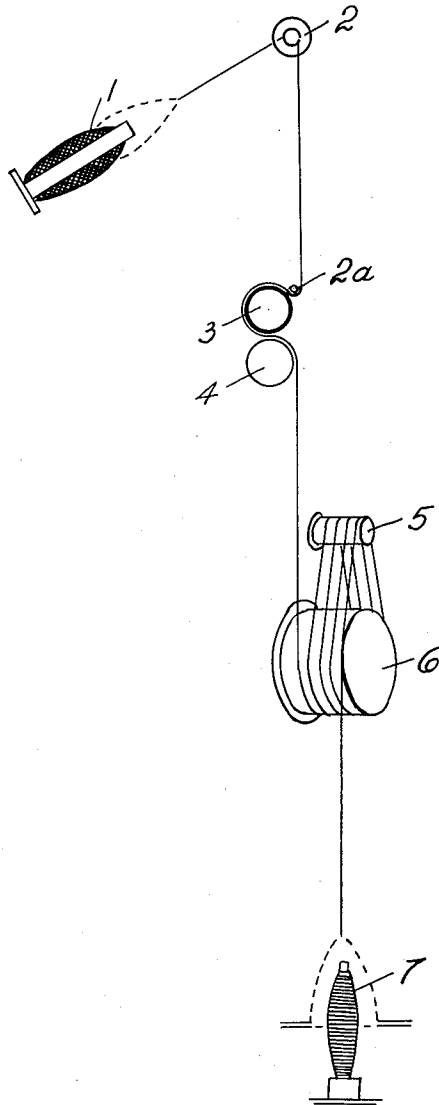
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DEVICE FOR STRETCHING SYNTHETIC SILK

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DEVICE FOR STRETCHING SYNTHETIC SILK

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1 Claim. (Cl. 28—71.3)

This invention relates to an improved device for stretching synthetic silk.

More particularly the invention relates to a method for stretching superpolyamides and superpolyurethamines.

The usual procedure of stretching polyamides consists in leading the yarn to be stretched between two rollers whose speeds correspond to the desired degree of stretch over a braking device, preferably an agate pin of not more than 1/2" diameter, so that the "stretch point" is restricted to a length of 1/2". Only in this manner it was hitherto possible to produce uniformly stretched yarn.

It developed that the agate pin, which through the heat of friction may get hotter than 120° C., is the cause of capillary rupture, i. e. rupture of some of the component threads or even ruptures of the entire thread. In order to overcome this disadvantage, the speed of stretching has to be reduced. Thus, for instance, 260 den. (stretched) cord silk which is stretched five-fold and more, cannot be stretched at a higher speed than 120 m. per min. By the frequency of thread ruptures one is also limited to a certain maximum relative stretch. This is a disadvantage insofar as at higher relative stretch the quality of the yarn is much improved.

It is an object of this invention to provide a new method and a new device permitting to pull the yarn off the supply-roller at a constant speed, thereby avoiding the disadvantages pointed out before.

This is performed, according to the invention by giving the yarn to be stretched a sufficiently high preliminary tension before applying the proper stretch.

The yarn thus obtained exhibits no titre variations, or irregularities in dyeing quality, due to the special kind of stretching according to this invention.

In carrying out my invention a device as schematically shown in the accompanying drawing may be used.

Reference 1 is the spool, carrying the silk to be stretched; 2 is a thread brake, and 3 is a weighting roller provided with an outer layer of cork, rubber, or plastic; 4 is the feed roller for the yarn to be stretched; 5 is a deflection roller; 6 is the tension roller; and 7 is the spooling device.

The speeds of roller 4 and of roller 6 determine the amount of stretch. If roller 4, for instance, runs at 50 m./min. and roller 6 at 200 m./min. there results a stretch of 1:4.

The yarn to be stretched runs from spool 1 over the thread brake 2 to the deflection thread guide 2a, is wrapped around about 3/5 of weighting roller 3, runs off the feed roller, over roller 6 to the deflection roller 5, the latter two being wrapped at least three times by the yarn, and is spooled on spooling device 7.

In carrying out the invention the unstretched yarn is given, between 2 and 2a, by means of the thread brake 2 (thread restriction) a pre-tension corresponding to the titre and/or the stretch, whereby the frictional resistance at the feed roller becomes so high that the yarn is drawn off at constant speed at the contact point of the rollers 3—4.

For the thread brake 2, every usual form is suitable

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as long as it achieves a fully uniform impedance of the thread which can be regulated according to the titre.

Continued checks of the titre have shown that the uniformity of titre in the process according to invention is as good as in the processes known heretofore.

On the other hand, the process according to invention shows a considerable decrease of thread and capillary ruptures. Thus a direct improvement of quality is achieved, but the quality is improved to a far greater degree if the stretch ratio is increased to the maximum allowed by the number of thread ruptures. As the examples indicate, the strength then increases considerably while the elastic stretch is reduced.

A further advantage of the process according to the invention is that the number of thread ruptures is independent of the speed of stretching so that the latter may be increased at will.

Example 1

Stocking silk of caprolactampolyamid, 12 thread, unstretched titre 108=30 den. stretched, exhibits at a stretch ratio of 1:3.7, the following number of thread ruptures figured on 100,000 m.:

Manner of stretching	Thread ruptures	Capillary ruptures
According to present invention.....	2.1	6.9
According to previous practice.....	8.8	57.4

Thus, the new process results in only 1/4 of the complete thread ruptures heretofore and less than 1/10 of the capillary thread ruptures.

Example 2

On the basis of an equal number of ruptures in the present new process as compared with the previous processes, the stretching can be carried out in the new process to a ratio of 1:3.8, but in the old process only to 1:3.6, whereby the following differences of strength occurs:

Ratio of stretching	Titre (den.)	Rupture Load, g.	Stretch, percent
New process 1:3.8.....	30.1	185.5	19.5
Old process 1:3.6.....	31.4	140	29.3

This comparison indicates very clearly the quite considerable advantages of the new process.

I claim:

A device for stretching polylinear yarns of the type of superpolyamides and superpolyurthanes comprising a spool for the yarn to be stretched; a thread brake, a weighting roller and a feed roller pressing together, between which the yarn delivered from said spool is led and moved; stretching means for the yarn delivered from said rollers; and a spooling device for the stretched yarn, said thread brake being arranged between the spool carrying the yarn to be stretched and said weighting and feed rollers in order to impart pre-tension to the material before the stretching process proper is performed.

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