

Study Of Damageability Of War Threads According To The Threading Width Of The Sp-140 Warling Machine

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Abstract: The aim of this work is to evaluate the stress-strain state of cotton yarn with a linear density of 25 tex on the warping machine SP-140, installed in the warping department of the preparatory workshop of the weaving production at the Textile Company Paxtakortex LLC.

Keywords: Stress-strain state of cotton yarn, linear density, warping machine SP-140, weaving production workshop.

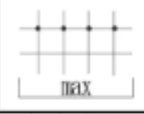
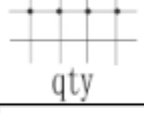
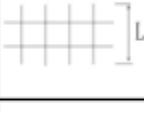
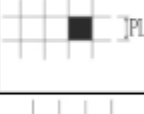
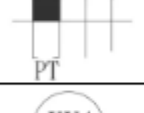
INTRODUCTION:

The aim of this work is to evaluate the stress-strain state of cotton yarn with a linear density of 25 tex on the warping machine SP-140, installed in the warping department of the preparatory workshop of the weaving production at the Textile Company Pakhtakortex LLC.

The relevance of the work lies in the study of the stress-strain state of cotton yarn with a linear density

of 25 tex, which allows for prompt influence on the course of the technological process of warping, which will reduce breakage and increase productivity, both in warping and in subsequent processes.

The scientific novelty lies in the use of modern methods for calculating the damage of cotton yarn with a linear density of 25 tex by the width of the thread on the warping machine SP-140.

Program		HWJX1500	HWJX2000	HWJX2500
	Wire diameter	2.5-6.0mm	2.5-6.0mm	2.5-6.0mm
	Max mesh width	≤1500	≤2000	≤2500
	Number of electrodes	31	41	48
	Mesh Length	0.7-6.0m	0.7-6.0m	0.7-6.0m
	Cross wire spacing	50-300mm	50-300mm	50-300mm
	Line wire spacing	50-300mm	50-300mm	50-300mm
	Electric capacity	500KVA	630KVA	800KVA
	Work strokes	40-60/min	40-60/min	40-60/min
	Control System	PLC programmable controller	PLC programmable controller	PLC programmable controller

The practical significance lies in the fact that recommendations were given to improve the quality of the technological warping process carried out during the processing of cotton yarn with a linear density of 25 tex on the SP-140 warping machine.

A study of the warp thread tension across the threading width on a warping machine was conducted on a machine under dynamic conditions.

The determination of the thread tension is carried out

in an area accessible for experimentation – the “creel machine” – using a strain gauge installation.

Ten points of one warp thread were selected evenly across the creel threading width in one row.

With the warping machine running, the thread tension data were taken using a strain gauge installation according to the developed scheme shown in Figure 1.

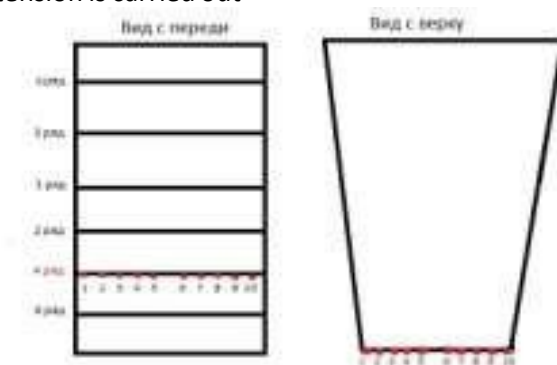


Fig. 1 - Diagram of the location of points on the warping machine creel where thread tension measurements were taken using a strain gauge.

The strain gauge installation is designed to measure the tension of a group of moving threads and is used to measure the tension of threads on weaving equipment when performing research work.

As a result of the experiment, tensograms of warp

thread tension at 10 points were obtained using a strain gauge setup. An example of a tensogram at point 1 is shown in Figure 2.

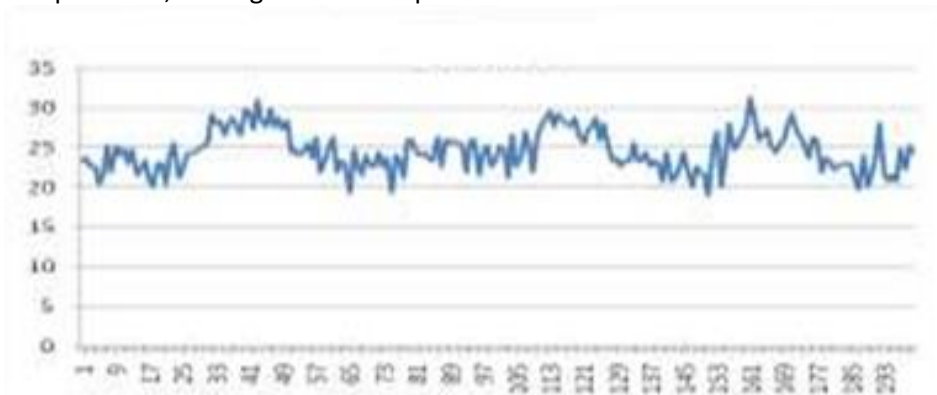


Fig. 2 - Tension tensogram of warp threads of cotton yarn with a linear density of 25 tex on the warping machine SP-140 at point 1

After receiving the tensiograms, a selection was made from the experimental database of the thread tension section and the formation of the initial data base in the program "Calculation of damage to threads and yarn during technological processes of weaving production according to the Moskvitin long-term strength criterion based on the use of Newton's interpolation polynomial", as a result of the calculation we obtain a mathematical model using the Newtonian function approximation method and

subsequently determine the thread damage coefficient according to the Moskvitin long-term strength criterion.

During the calculation on the computer, the values of damage coefficients of cotton yarn with a linear density of 25 tex were obtained on the warping machine SP-140 installed in the warping department of the preparatory workshop of the weaving production at the Textile Company Paxtakortex LLC, presented in Table 1.

Table 1 - Values of the coefficient of damage of threads during warping η .

Interval	Damage coefficient	Root Mean Square Error
1	0.42014	8.59860
2	0.46375	13.10635
3	0.39407	22.14699
4	0.5204	3.13838
5	0.36159	8.15756
6	0.39108	9.22466
7	0.45165	8.99082
8	0.4045	6.45865
9	0.40675	10.44365
10	0.48535	3.26104

Based on the obtained values, a graph of the distribution of thread damage by the threading width on the SP140 warping machine during the processing

of cotton yarn with a linear density of 25 tex was constructed, which is presented in Figure 3.

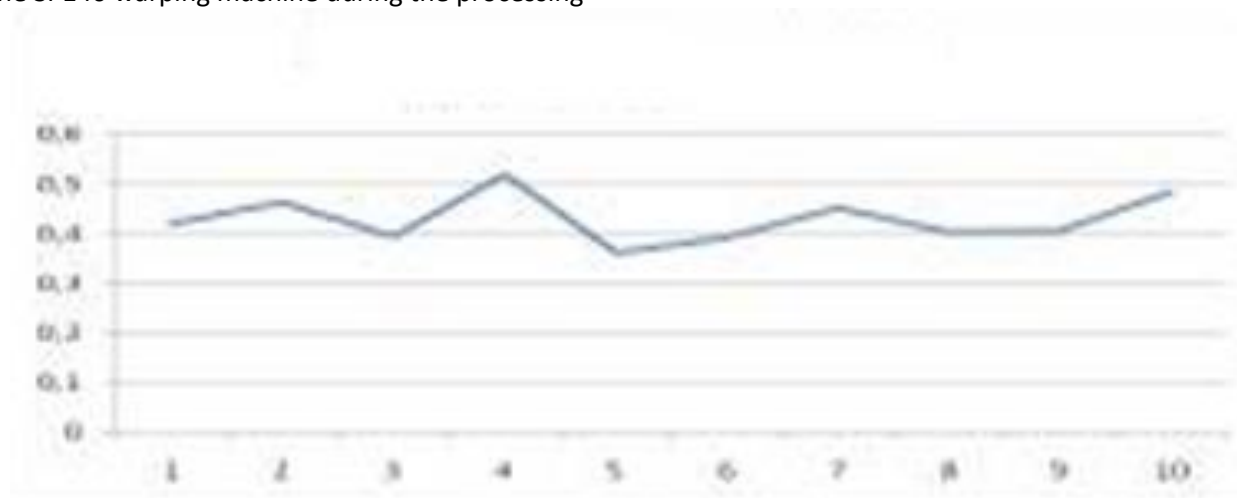


Fig. 3 - Graph of distribution of thread damage by threading width on the SP-140 warping machine when processing cotton yarn with a linear density of 25 tex.

CONCLUSIONS

As a result of the conducted research, it was established that during the technological process of warping on the SP140 warping machine at OOO Paxtakortex, when processing cotton yarn with a linear density of 25 tex, points were established in which increased breakage of threads was observed, and points were also established in which the process takes place in rather stressful conditions. From all this, it can be concluded that the damage of cotton yarn with a linear density of 25 tex across the width of the threading on the SP-140 warping machine is not uniform and it is necessary to coordinate the technological process of warping.

The development of recommendations based on the results of this work on the degree of reduction of thread damage and improvement of the quality of manufactured products are as follows:

When developing a warping technological mode, be guided by the results of the research work and adjust the tension device of the warping machine in order to equalize the tension across the width of the warp;

When assessing the stress-strain state of threads, use the determination method using the Moskvitin long-term strength criterion proposed in this work;

When calculating the damageability of a thread during mathematical modeling of the warping process and calculating damageability, use the program developed in the environment "Calculation of damageability of threads and yarn during technological processes of weaving production according to the Moskvitin criterion of long-term strength based on the use of Newton's interpolation

polynomial".

REFERENCES

1. Program in the programming environment "Calculation of damage to threads and yarn during technological processes of weaving production according to the Moskvitin long-term strength criterion based on the use of Newton's interpolation polynomial" by M.V. Nazarova
2. Nazarova M.V. Development of automated methods for designing technological processes for manufacturing fabrics of a given structure. Diss. for the degree of Doctor of Technical Sciences - 2011
3. Handbook of Cotton Weaving / Bukaev P.T., Onikov E.A. and others. – M.: Legprombytizdat, 1987. – 576 p.
4. Vlasov P.V., Shosland Ya. Nikolaev S.D. Forecasting the technological process of weaving. – M.: MTI, 1988. – 41 p.