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QUALITY INDICATORS OF BICOMPONENT YARN MADE FROM NATURAL FIBERS WITH HIGH HYGIENIC PROPERTIES

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Abstract
In this article, based on the analysis of modern researches devoted to the process of weaving fabric made from natural and cotton raw materials, information and recommendations were given about the working process of the currently used equipment, sorting equipment of theoretical and practical importance. The task and purpose of the research is to increase the efficiency of weaving, reduce the cost of weaving and prepare a competitive product in the world market by conducting theoretical and practical research. This product is made of 100% natural fibers.

Keywords: Cocoons, natural silk, raw silk, unwinding, warping, twisting, surgical thread, resulting linear density, quality, standard, surgical operation.

Introduction

Rewinding silk

The purpose of re-winding silk is to make it suitable for further technological processes. Also, in the process of re-winding, the quality of the silk is improved by removing thin, very thick and large knotted areas, and by cleaning all kinds of impurities in the silk, and the amount of silk in the winding increases several times.

The improved quality of silk in the process of rewinding leads to an increase in productivity in subsequent processes and an increase in the quality of semi-finished products made in the process. In our dissertation work, a spool of silk is made from a silk skein in the MSH-3 silk rewinding machine. The following Table 1 shows the technological indicators of re-winding natural raw silk with a linear density of 3.23 tex on the MSH-3 rewinding machine.

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Table 1 Technological indicators of re-winding of natural raw silk

No.	Name of technological indicators	Unit of measure	Value	
1	Machine type	MSH-3		
2	Linear density of silk	Tex	3.23	2.33
3	Rewind speed	m/min	160	160
4	Input wrapping type	spun		
5	Weight of raw materials in a package	g	80-150	60-140
6	The tension of the thread in the winding	sN	10-20	10-15
7	The weight of the suspended load on the boat	g	120	100
8	Number of normal interruptions	Uz/kg	25-40	40-70
9	Type of packaging available	rell		
10	The density of the coil winding	g/sm³	0.6-0.7	0.6-0.7
11	The winding step of the hook on the spool	mm	1.1-1.7	1.6-1.7
12	The width of the hook wrap on the spool	mm	100	100
13	The mass of the hook winding on the reel	g	140-160	100-110
14	Ring connector number and node type	“0”; simple knot		

Research of the quality parameters of cotton yarn

The degree of ripeness of cotton fiber is one of the most important properties, and its determination is a very laborious process. This work can be done mainly in scientific research centers or institutions. Cotton ginning and textile enterprises operating in Uzbekistan use special methods to perform these tasks. These methods are a bit laborious and take some time. Technological processes in the textile industry consist of a complex set of physical and chemical phenomena, which can only be successfully researched using modern advances in science and technology [1]. Every production, including textiles, involves the reception of raw materials, the production of semi-finished products in various workshops and their reception in subsequent departments, the production of finished products, the adoption of new techniques, the improvement of technological processes, technological there are common problems such as placement of equipment and optimization of their basic technological and structural parameters [2].

The product of the spinning process varies depending on the yarn used, the type of raw materials used, and the methods of spinning. Raw materials are selected depending on the cooking of the thread and the customer's order. Also, the quality of yarn is evaluated based on consumer requirements [3]. Various additional works are performed in order to satisfy the consumer's demand. In addition to the properties of raw materials, thread properties also depend on the alternation of the working parameters of technological equipment. It should be noted that yarn with different properties can be obtained from the same raw material in different spinning methods.

The main function of the ring spinning machine is to produce yarn from the pile. The purpose of the spinning machine is to ensure the continuity and durability of the product, which is several times thicker than the thread, and to form a coiled thread with a convenient shape for

further processing. In the ring spinning machine, mainly three technological processes are performed - stretching, baking and winding [4].

The thread coming out of the coil windings on the suspension handle of the supply device, covering the guide pins, passes through the tensioner of the drive mechanism and comes to the supply pair of the stretching tool. In the stretching device, the hair is thinned to the specified linear density and comes out from the output pair in the form of a thin tuft. A fluff sucker is installed at the bottom of the take-out cylinder, and when the thread breaks, it pulls the fibers into the fluff sucker system. After twisting the resulting thread into a thread, the thread passes through the conductor and is cooked continuously under the influence of a high-frequency spinning iron. Then the thread passes through the loop and is wound into the tube [5].

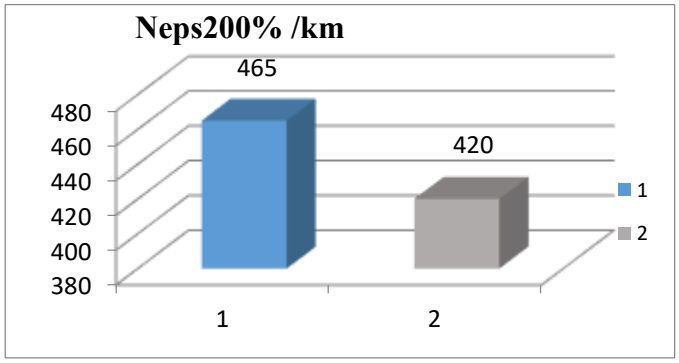
The experiment was carried out in the production conditions of the yarns of the 1st sample at "Vodiy Toshlok Fergana" textile LLC, and the yarns of the 2nd sample at the "Expo-solor print" LLC enterprise. Yarn samples were taken under experimental and production conditions of Rieter ring spinning machines installed at the enterprises.

A number of experiments were conducted in order to improve the quality indicators of spun yarns. Experimental tests 16.5 tex spun yarn was produced and the quality indicators of the obtained samples were determined in modern laboratory equipment of the enterprise. The obtained results are presented in.

Table 2 The main properties and quality indicators of Nye 40/1 (16.5 tex) thread taken for experimental testing

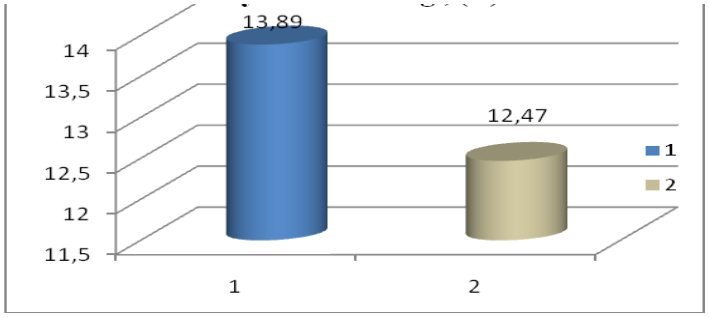
№	Name of indicators	Unit of measure	Uster statistics 2025 %	Ne 40/1	
				1st	2nd
1	Linear density	tex	20	20.10	20.15
2	Number of twists	TPM	400	440	460
3	Breaking strength	cN	380	308	314
4	Relative breaking strength, (Rkm)	cN/tex	14.5	14.5	14.7
5	Elongation at break, Ye	%	6.5	6.51	6.15
6	Unevenness according to Uster, (U)		13.71	12.47	13.89
7	(- 50%) / thin areas	Pieces/1000meters	2.5	2.5	3.12
8	(+50%) / thick areas	Pieces/1000meters	262.5	285.0	312.5
9	(+200%) / nodes	Pieces/1000meters	400	420	465
10	Hairiness, N	%	4.4	4.7	5.08

We know the important role of densifiers in the active zone of the stretching tool in thread formation. It affects the parameters of product maturity.



Example 1
Example 2

Figure 3. Histogram of the difference in Neps, 200%/km of knots of the yarn obtained in the two variants.



Example 1
Example 2

Figure 4. Histogram of the difference in % of the Uster non-textile of the yarn obtained in the two variants

The unevenness of the spun yarns refers to the repetition of their thin and thick parts. In our study, we compared the spun yarns, that is, the yarns produced at the enterprise, and the yarns obtained through experiments, and we managed to determine the difference in their indicators. It was found that the unevenness of the spun yarn produced in sample 1 is 12.47%, while the unevenness of the yarn obtained in sample 2 is 13.89%. In this, we can see that the unevenness of sample 1 yarn is improved. The purity of the thread is determined by the defects on its surface. The smoother and cleaner the thread, the smoother and better the fabric will be. Currently, the term "neps" is an important indicator [2]. In the conducted research, when we checked the defects on the surface of the yarn on the USTER TESTER 6 device, the average number of knots of the spun yarn of the 1st sample was 420 units/km, and the number of defects of the yarn in the experimental sample of the 2nd sample was 465 units/km. we can see. It can be seen that when comparing the 16.5 tex yarns from sample 1, the yarn in the sample compared to the yarn produced in sample 2 was improved by 11%.

Conclusions

1. When creating a program for weaving new shirt fabric from silk and cotton yarns, the main weaving class: linen weaving was selected.

2. For the body of the fabric, we used cooked silks with a linear density of 3.23x3 tex, the number of twists in the Z direction was 300 twists/m, and cotton with a thickness of 16.5-17 tex and 400 twists/m.
3. The technology of production of shirt fabric from a mixture of silk and cotton threads was created and its technical parameters were justified.

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