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Production of Medical Products from Natural Silk

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Abstract: This article provides information on the production of medical dressings from silk threads, machine sequences and sample characteristics. Taking into account the fact that the fabric is of different thicknesses, technological parameters have been developed for warp and argob yarns. The sequence of technological processes for the production of textile with new content was selected and its indicators were determined. The technological parameters developed for the machines necessary for the execution of the process are presented. Samples of medical products with different surface densities were obtained from raw silk, spun silk, and silk and cotton blends using the cloth method.

Keywords: defective cocoons, raw silk, linear density, rewinding, kalava, reel, blown silk threads, strength of turns, warp, rope.

In recent years, complex measures have been implemented in the Republic to develop the cocoon industry, expand the types of products, as well as comprehensively support the export and investment activities of cocoon industry enterprises. In particular, in a series of decisions taken by the head of state and our government, deepening the reforms implemented in the sector, creating favorable conditions for rapid development, wide introduction of the cluster method of production organization, increasing the volume of investments in the deep processing of cocoons, and ready-made products with high added value the goal is to widen the production of products.

The textile industry plays an important role in the development of the republic's economy. It provides the population with clothes and household items. It is no secret that the textile industry closely cooperates with agriculture and other sectors. The production of spun yarn is one of the important branches of the textile industry. By developing the textile industry, it is possible to achieve a further increase in the export volume of silk products.

As you know, the technology from the cocoon to the production of the finished product includes many processes. Sorting of silk waste according to its origin, separated into waste from cocooning sheds and control collection department [1].

It can be concluded from this study that using raw silk of 10, 27, 42 and 100 d linear density, 200 d linear density of 100, 200, 500 and 1000 br/m were produced and their quality indicators were determined. According to the results, the physical and mechanical properties of spun silk are strongly dependent on the number of twists, and its structure is strongly dependent on the dimensions of untreated raw silk. In addition, the characteristics of the flexibility of the spun yarns obtained from raw silk with high linear density were very high [2].

In this work, the sequence of technological processes for the preparation of woven threads from raw silk for the production of medical bandages is shown. Add 2,33 tex raw silk with 3 left side woven S 350 br/m and add 3,23 tex raw silk with 8 left side woven S 500 br/m. Based on the research results,

the linear density, breaking strength, variation coefficient of linear density, elongation to break, number and direction of twists, variation coefficients of twists are presented [3-5].

In this study, the relevance of the problem, antibacterial silk napkins made of natural silk were used in the treatment of inflammatory diseases of the maxillofacial area. In patients with purulent-inflammatory diseases of the maxillofacial region, the use of boiled silk medical napkins has been shown to reduce the local symptoms of the disease compared to traditional treatment. The use of silk boiled medical napkins for the treatment of wounds in purulent-inflammatory processes in the maxillofacial area significantly accelerated the process of cleaning the wound, that is, it helped in the growth of skin tissue [6-9].

Hygienic properties of silk fabrics are determined based on their functional tasks. Shirt silk fabrics are characterized by water absorption, air, vapor, water permeability, etc. properties.

The production and processing of natural silk textile products (yarn, fabric, etc.) is one of the most complex technological processes of the textile industry. Products made of natural silk are characterized by high sanitary-hygiene properties, durability, ease of use, shine and good appearance. The need for silk fabrics in the world market is increasing not only in clothing, household, but also in the technical and medical fields.

Taking into account that silk has high hygienic (antiseptic) properties, TITLI's "Textile fabric technology" department together with the "Silk Technology" department is conducting scientific research on the creation of a new type of silk fabric and researching its properties, and the following tasks are being carried out as a goal:

- study of factors affecting the structure of silk tissue;
- in order to expand the possibilities of assortment of modern looms, production of silk fabric with a new composition based on three types of weaving ;
- research of complex indicators describing the structure and technological conditions of production of silk fabric with new composition;
- determination and comparative research of physical-mechanical properties of tissues with new composition.

The technical and technological indicators of the new composite fabric are presented in Table 1 below.

Table 1

No	Indicators	Unity	Quantity
1.	Thread type		Silk
2.	Strip the threads: by warp by weft	*tech*	 3,23 3,23
3.	Tissue density: by warp by weft	*yarn/dm*	 60 75
4.	Tissue surface density	g/m^2	19,7
5.	Thread shrinkage: by warp by weft	*%*	 1,6 1,5
6.	Reed number	*tooth/dm*	60
7.	The number of threads passed through the reed	*yarn*	1
8.	installed lamellas	*pieces*	4
9.	Weave rapport by warp by weft	*yarn*	 2 2

The following technological processes (Fig. 1) were selected for the production of an experimental sample of a fabric with a new composition: rewinding (Murata R11-7 rewinding machine) → picking (Beninger pleating machine) → weaving (shuttle loom) [10-12].

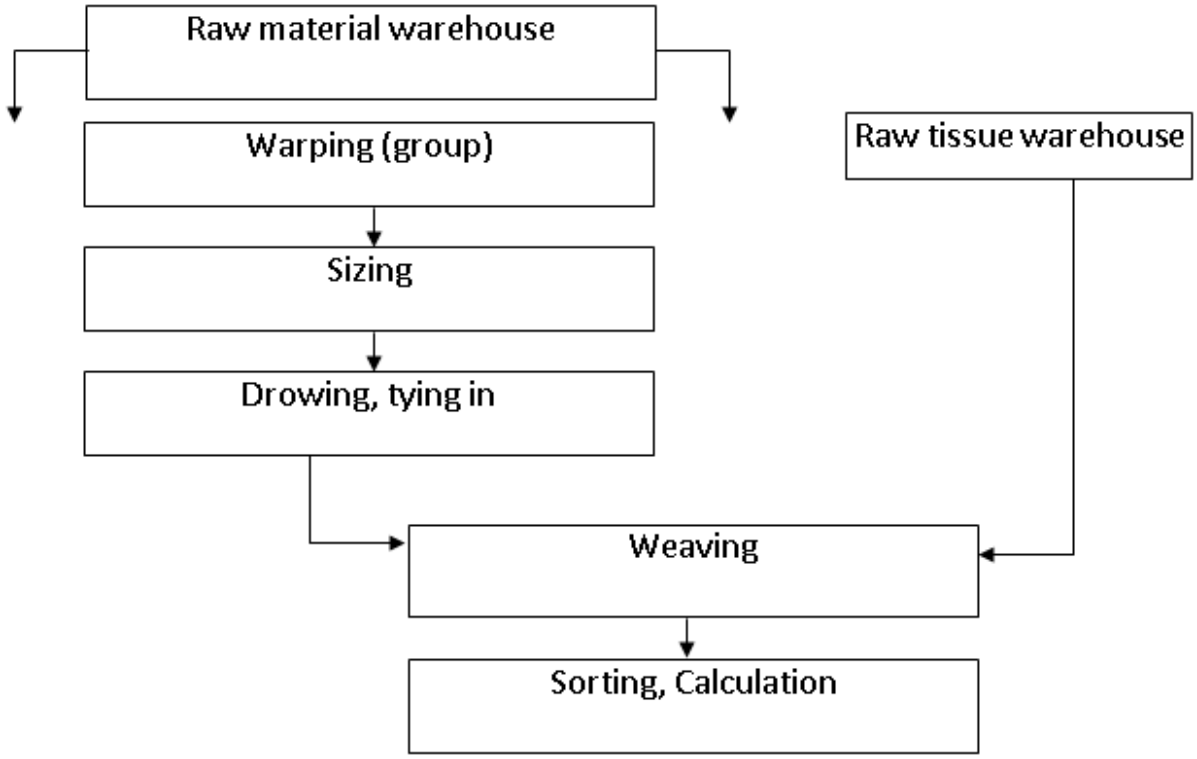

Figure 1. Technological processes of experimental sample production

Factors were calculated for each technological process of preparation of warp and weft yarn for fabric production, and some were selected based on references. Table 2 below shows the technological process adopted to produce the new composition fabric on the loom factors are listed.

Table 2. Preparation department according to technological processes factors

No	Warping factors	Unity	Rewinding factors	Warping factors
1.	Thread line density	Tex	14	14
2.	Warping speed	m / min	400	300
3.	Thread tension	cN	35	35
4.	Number of breakage	rpm /10^6 m	3	2
5.	Packing density	g / cm^3	0,48	0,48

AT-100 shuttle loom is used in the weaving process. Table 3 lists the refilling factors.

Table 3. Factors of processes in the weaving department

1	Loom speed	*rpm /min*	210
2	Breakage of threads is 1 *m* tissue	*break / m*	0,30
3	Weft of threads breakage	*break / m*	0,06
4	Thread tension : Warp Weft	*cN*	50 15
5	Weft thread sliding paths	*mm*	2
6	Number of average circumstances	*mm*	25
7	Throat height at reed	*mm*	48
8	The distance from the center of the tissue to the leading edge of the warp	*mm*	680
9	Distance from the edge of the fabric to the middle of the lamella	*mm*	890

2nd picture tissue weaving enthronement on the table scheme shown .

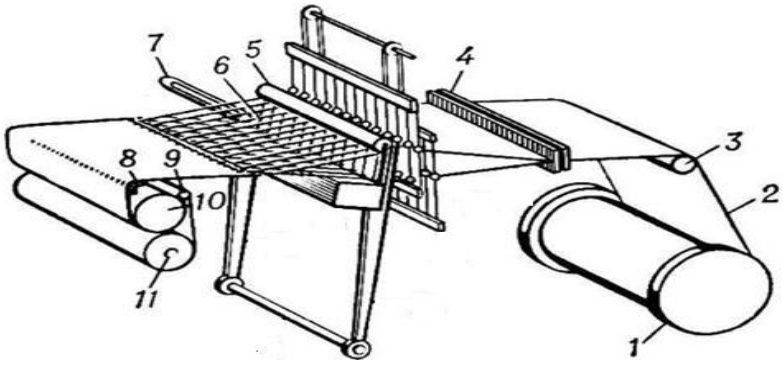

Figure 2. Schematic of the technological layout of the shuttle loom

1. weaving reel; 2. Warp thread; 3. scale; 4. lamella; 5. item; 6-yarn thread; 7th shuttle; 8-grudnitsa; 9- roller; 10- valyan .

1. weaving reel; 2. warp thread; 3. scale; 5. Sunken; 6 weft threads; 7. shuttle; 8. loom breast ; 9. roller; 10. felted.

The main goal was to ensure the following technological factors when the machine was working and refilling:

- ✓ mechanisms parameters high stability;
- ✓ controls loom factors;
- ✓ tissue width easy adjust;
- ✓ production specific weave;
- ✓ tissue stretch for soft materials apply opportunity;
- ✓ Threads breakage eliminate reach the time reduce.

The calculation of tissue engraftment is given in the final Table 44.

Table 4. Don't read T enthronement h number final schedule

No	Naming	Unity	Quantity
1	Binding coefficient		0,59
2	weave replenishment factor		0,41
3	number of threads in the middle fabric	*yarn*	580
4	number of threads in the shed	*yarn*	20
5	Total thread count	*yarn*	600
6	reed number	*tooth / dm*	120
7	Surface density of 1 m2 raw tissue	g / m^2	19,7

To ensure the tension of the base threads, the base threads are secured using the thread adjuster of the machine. With the help of the warp brake, the required warp thread tension is created.

As the diameter of the weaving bobbin changes, the tension of the additional thread also changes, that is, it increases. In order to maintain the same tension, it is necessary to maintain the same tension of the thread coming out of the bobbin as the diameter of the weaving bobbin decreases. For this, the amount of gravity varies accordingly.

Due to the high thread density and small winding diameter in the production of silk bobbins, the influence of the interrelationship between the tension of the bobbin thread and the diameter of the bobbin is less. One of the main factors is to maintain the tension of the warp threads at the same level across the width of the weaving reel. Also, due to the low density of the fabric (Pt=60 *ip/dm)* in the production of gauze, it is necessary to ensure its continuity due to the large amount of transfer of the warp thread to the fabric formation zone during the formation of the fabric element.

Medical products with different surface densities from raw silk, spun silk, and silk and cotton blends using the cloth method. It was found that natural silk contains up to 30 percent of sericin after boiling it, and the residue does not exceed 3-4 percent. When boiling sericin from silk, an emulsion was prepared based on a special recipe in mixtures of natural substances that do not affect the quality of silk. The quality indicators of the new range of silk gauze samples boiled on the basis of the prepared emulsion were studied on the modern equipment installed in the certification laboratory at TITLI.

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