IMPROVED TECHNOLOGY OF PREPARING SILKWORM COCOONS FOR UNWINDING

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Annotation: *this article presents the results of research work on the study of the current state and improvement of the technology of accepting live cocoons from silkworms, transporting and filling the internal volume of silkworm cocoons with process water in preparing them for unwinding. For the acceptance of live cocoons, their transportation and storage, a solid container in the form of suitcases was created and tested in production conditions. And to fill the internal volume of cocoons with process water, a universal vacuum unit was created and tested under production conditions. The use of improved methods in the production conditions of cocoon-winding enterprises creates the possibility of producing raw silk with high technological and quality indicators.*
Key words: *silkworm, live cocoon, cocoon harvesting, drying, interior space, storage, cocoon winding, steaming, linear density, raw silk, quality*

The Republic of Uzbekistan is one of the leading countries in the world in the cultivation and processing of silkworm cocoons. The cocoons of the silkworm silkworm go through several stages of preparation before the raw silk is spun. At each stage, certain technological processes are carried out; in most cases, these processes require a large amount of manual labor. Currently, the methods and equipment used when receiving cocoons cannot ensure good preservation of the quality indicators of cocoons. Grown-up cocoons are brought in their own containers, baskets, bags, etc. When receiving or handing over cocoons, rigid nets are practically not used; the resulting cocoons are collected in one place. This situation leads to a significant deterioration in the quality of cocoons. Many scientific studies have been carried out on the acceptance, transportation and storage of cocoons [1, 2, 3, 4, 5,], many designs of rigid networks for transporting and storing cocoons have been proposed, and some rigid networks have been introduced. production, but they are not used anywhere. Therefore, improving the technological processes for receiving, transporting, drying and storing silkworm cocoons is considered one of the most pressing issues today [6,7].

In order to improve the existing technology, a number of scientific studies have been carried out and a number of proposals have been made. For example, based on a new technology for the preparation and pre-processing of cocoons, solid (metal) boxes have been developed, and the ability to mechanize manual operations has been created. As a result, the processes involved in storing and transporting living cocoons from collection to drying were carried out in boxes made of solid material. This, in turn, freed the cocoon workers from the heavy manual labor associated with dropping cocoons on the ground, carrying them in bags, and turning and mixing the cocoons with shovels. The practical use of these cells protects cocoons from crushing, deformation and deterioration in quality [8,9]. Some researchers have proposed making cocoon boxes from wood. The dimensions of such cages are 60 cm in length, 50 cm in width and 40 cm in height, with a capacity of 20 kg of cocoons. At one time, such bags were used at the Margilan silk factory and other fulling enterprises [10]. But the use of such cages was one- or two-season, and required a large building or covered area to store them during the off-season. This is the biggest drawback of these cells and these cells are not widely used. Therefore, a number of researchers have proposed making elements from perforated duralumin. Such cages are made with dimensions of 60 x 50 x 40 cm, the capacity of the cocoons is 20 kg, the net weight of the cage is 7 kg, the number of perforations in them is 1992, the diameter of the holes is 8 mm [11, 12]. However, due to the high cost of these boxes, they were not widely used in production. Based on the above, the Andijan Mechanical Engineering Institute has developed a device in the form of a suitcase for receiving, transporting and storing living cocoons until they are dried. The basis of the new device is a prefabricated rib of the device (frame), which is assembled from metal tubes 0.6 mm thick and 12 mm in diameter (see Fig. 1).

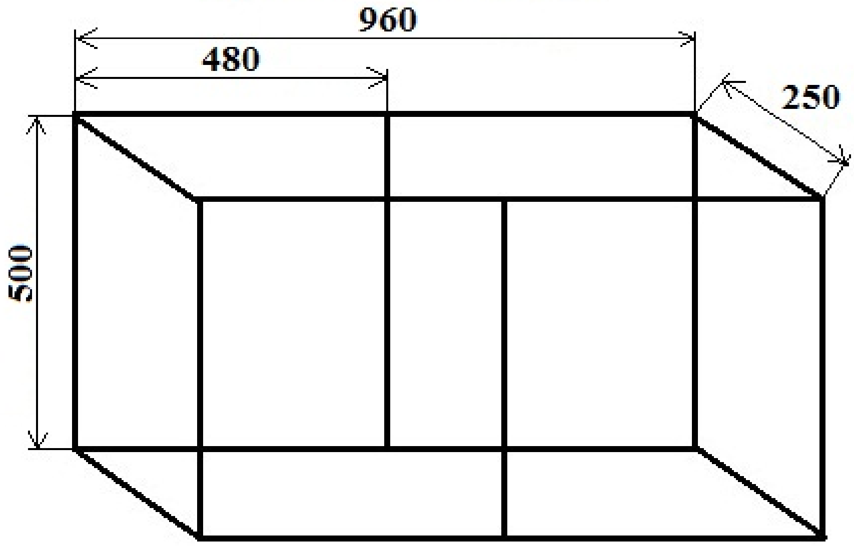

Figure 1. New frame diagram of the device for receiving, transporting and storing cocoons.

The dimensions of the new device are 960 x 250 x 500 mm, it is attached from a high-hardness textile material. The fabric used should be highly breathable and lightweight. The device weighs no more than 2.5 kg, and its load capacity is

16-20 kg. The fact that the device is made in the form of a suitcase made it easier to transport and store. In Fig. 2 provides an overview of the developed device.

Figure 2. General view of a new device for receiving, transporting and storing a cocoon

The new device has been tested under production conditions. The cocoons obtained in the new device, after drying, were tested in laboratory conditions; Table 1 shows the results of cocoon sorting.

Table 1. Results of sorting cocoons obtained on a new device in laboratory conditions

S/n	Naming indicators	A variant of cocoons	
		Experience	Control
1	Yield of seed cocoons, % Cocoons grade I Cocoons II grade	90,5 54,9 35,6	83,7 45,2 38,5
2	Yield of defective cocoons, % double cocoons spotted cocoons cocoon with a sharp tip thin-skinned cocoon crushed cocoons	9,5 3,7 2,5 1,8 1,0 0,5	16,3 3,2 4,5 2,0 1,1 5,5

3	Yield of cocoons by caliber, % small (14-15mm) medium (16-19 mm) large (20-22 mm)	17,0 79,6 3,4	19,5 74,8 5,7

Analysis of the research results presented in Table 1 shows that the yield of cocoons of the variety increased significantly for cocoons adopted in the new device. The main reason for this is the reduction of cocoon defects (cocoon crushing, increase in the number of spotted cocoons) caused by mechanical stress on cocoons in existing receiving processes. Because the use of new devices for obtaining cocoons minimizes the number of extra cocoons appearing in them. For example, the yield of crushed cocoons was 5.5% in the existing technology and 0.5% in the proposed technology, or the yield of spotted cocoons was 4.5% in the existing technology and 2.5% in the new technology.

A new design of a device for receiving, transporting and storing living cocoons has been developed and experimental copies of the devices have been created. Experimental copies of new devices were tested under production conditions. The cocoons received, transported and stored at new facilities were subjected to laboratory testing for sorting. As a result of the use of new devices, the yield of crushed cocoons decreased by 5% compared to the existing technology, and the yield of spotted cocoons decreased by 2% compared to the existing technology.

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