

**ФАН ВА ТЕХНОЛОГИЯЛАР
ТАРАҚҚИЁТИ**
**РАЗВИТИЕ НАУКИ И
ТЕХНОЛОГИЙ**



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METHODS FOR ELIMINATING THE MAIN PROBLEMS OF TECHNOLOGICAL SECTIONS OF WOOL PROCESSING IN OUR REPUBLIC.

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Abstract. This article discusses existing problems in wool processing technologies in Uzbekistan, especially in the Karakul industry. It emphasizes the need for modernization of outdated systems and the development of new, efficient methods adapted to local wool properties. Proposed solutions aim to improve fiber quality, increase productivity, and support sustainable growth in the textile sector through technological innovation and research-driven approaches.

Keywords: wool processing, karakul wool, fiber quality, modernization, technology, innovation, textile industry, productivity, Uzbekistan, sustainable development, local resources, efficiency

МЕТОДЫ УСТРАНЕНИЯ ОСНОВНЫХ ПРОБЛЕМ ТЕХНОЛОГИЧЕСКИХ УЧАСТКОВ ПЕРЕРАБОТКИ ШЕРСТИ В НАШЕЙ РЕСПУБЛИКЕ.

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Аннотация. В статье рассматриваются существующие проблемы в технологиях переработки шерсти в Узбекистане, особенно в каракулеводческой отрасли. Подчеркивается необходимость модернизации устаревших систем и разработки новых эффективных методов, адаптированных к свойствам местной шерсти. Предлагаемые решения направлены на повышение качества волокна, увеличение производительности и поддержку устойчивого роста текстильного сектора за счёт технологических инноваций и научных подходов.

Ключевые слова: переработка шерсти, каракулевая шерсть, качество волокна, модернизация, технология, инновация, текстильная промышленность, производительность, Узбекистан, устойчивое развитие, местные ресурсы, эффективность

RESPUBLIKAMIZDA JUNNI QAYTA ISHLASH TEXNOLOGIK TARMOQLARINING ENG ASOSIY MUAMMOLARINI BARTARAF ETISH USULLARI

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Annotation. Maqolada O'zbekistonda, xususan, qorako'lchilik sohasida junni qayta ishlash texnologiyalarida mavjud muammolar tahlil qilinadi. Mahalliy jun xususiyatlariga mos zamonaviy va samarali usullarni ishlab chiqish hamda eskirgan tizimlarni modernizatsiya qilish zarurligi ta'kidlangan. Taklif etilayotgan yechimlar tolalar sifatini oshirish, ishlab chiqarish samaradorligini ko'paytirish va to'qimachilik sohasida barqaror o'sishni ta'minlashga qaratilgan..

Kalit so'zlar: junni qayta ishlash, qorako'l jun, tola sifati, modernizatsiya, texnologiya, innovatsiya, to'qimachilik sanoati, unumdorlik, O'zbekiston, barqaror rivojlanish, mahalliy resurslar, samaradorlik

In this day and age, there are very big problems in the processing of wool products and obtaining high-quality yarn from them in Uzbekistan. This article shows that, taking into account the technology of local wool processing and the situations of wool fiber gooing, fact is provided about the issue part of prevail carding and softening apparatus. The main of operation and types of carding machines at primary wool processing exercise are analyzed. The drawback of carding machines that affect the product are regard as. The principle of operation and model of new carding and softening machines are suggest for the production of class products.

For industrial processing, mainly clean (washed) wool should be used. The percentage ratio of the weight of washed (clean) wool to the weight of unwashed wool is called the amount of clean wool output. After washing and cleaning from oil and other impurities, 35-45% of fine-fiber wool is obtained, 45-55% of semi-fine wool is obtained, and 55-75% of coarse wool is obtained. Fine wool is uniform, consisting of twill fibers (the thinnest is 18-22 μm). The thinness and uniformity of the fibers in the staple along the length, and the uniform twist along the length of the fiber provide high physical and technological properties. The color is mainly white and black. Semi-fine wool is uniform, consisting of fluffy fibers or short fibers (average thinness is 23-38 μm). The color is most often white. Semi-coarse wool - consists of non-uniform, fluffy fibers, medium fibers and a small amount of fine staple fibers. It has an uneven composition in terms of fineness and length of the fibers. The colors are: white, gray, brown and black. Coarse wool - consists of non-uniform twill fibers, medium fibers, staple fibers. It is distinguished from semi-coarse wool by the unevenness of the fibers in terms of fineness and length. These four groups are divided into grades (high 1, 2, 3, 4) in the state standards for production and industry.

On the one hand, the article provides fact about the technology of most important wool activity. The device of wool production machines are schooled and their unuseful disadvantages are identified. The design and size of the quantity drum piles are analyzed. The designs of the softening machines used in the softening process are studied. The types and principles of carding and softening machines operating at primary wool processing enterprises are analyzed. Technical attributes of the machines are given. The harmful aspects of the mechanical influence on the product are renewed, and methods of spotless and softening are used without injury it. The deficiency of softening machines and their effect on the product are put into words. The design and operating principle of a new liquid sprayer for the preparation of high-quality products are proposed. The proposed characteristics of the machine are explained through calculations, which include high productivity, structural design, low energy consumption, energy efficiency and effective softening. The optimum version of the parts that have a positive effect on the unprocessed properties of the product is selected in this device.

On the ather hand, it is no overstatement to say that significant changes and developments were observed in the field of textile and wool processing in 2020-2024. For instance, 4 large wool processing enterprises were launched in Tashkent, 2 in Jizzakh, 1 in Navoi, 1 in Bukhara, and 2 in Karakalpakstan, and the existing ones were remake. In spite of the fact that, wool processing technology was only just beginning to improve 400-500 years ago, this speciality has developed significantly right now. There are two main factors in the processing of wool raw materials: high tech as well as high-class wool raw materials. From past centuries to the present, boosts in wool processing technology and upgrades in wool quality have keep on.

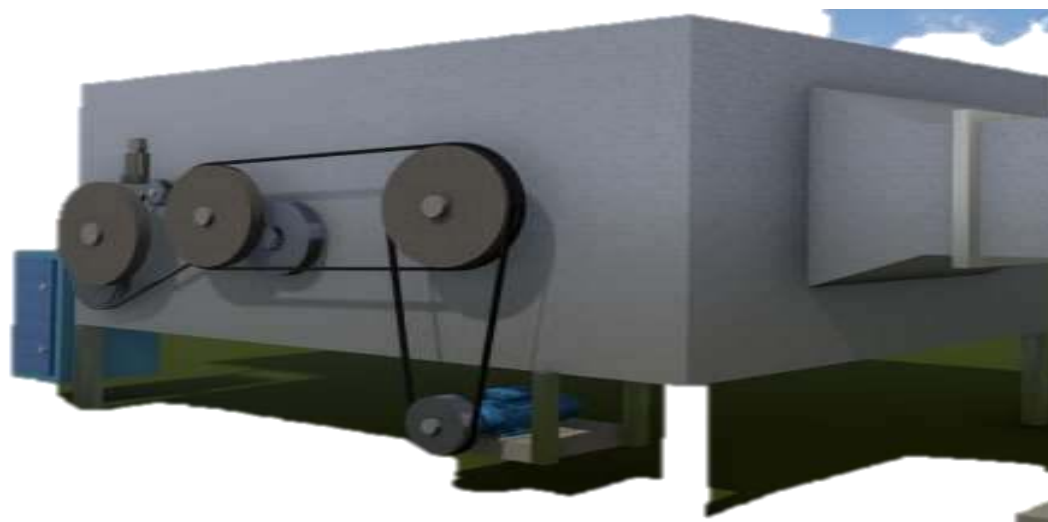
Karakul sheep wool grown in Uzbekistan meets state standards. Because at primary wool processing enterprises, mainly karakul sheep wool is processed, accounting for 60-70% of the export volume. Therefore, the technological indicators of karakul wool require experimental research. Before the processed wool arrives at primary processing enterprises, it is necessary to develop the necessary instructions for washing and cleaning it, determining the industrial grade of raw materials and reducing the level of contamination.

The dependence of the main structural structure of wool on the degree of coarseness (scale), that is, the degree of separation, and the density of the product in the working chamber

has been experimentally determined. Therefore, we present their calculation indicators in the table below. Since sheep of different breeds are sheared, the types of wool are sheared, in addition, their staple length, color, roughness, and fatness also differ.

Regardless of how, it should be noted that come into the possession of high-quality yarn from wool products in our republic is a very difficult business. In Europe and Central Asia, scientists have created a soft-wool sheep bring up for the production of industrial wool raw materials. In the news, wool processing schemes are being modernized and improved. Local wool multifariousness in the world contrast with depending on the weather conditions of the area and the breed of sheep wool. The main indicators of wool are manifested in its softness (fluff). The initial processing of wool includes receiving, sorting and washing by quantity and high sort. All natural sheep wool is divided into fine, semi-fine, semi-coarse and coarse. To accept wool by quality, a control classification is carried out with the selection of wool prototype for laboratory testing. Not all wool meets the control classification, only 10-20%, the results obtained be equivalent to the total incoming batch of raw materials. Industrial sorting of wool is carried out by hand on conveyor lines, by dividing the fleece into separate parts, which are certain grades that differ in physical, mechanical and technological properties of the fiber (fineness, length, strength, condition, color). During the sorting process, the production types of wool are category for subsequent primary processing and processing in spinning. The technology of primary processing of wool is shown in the figure below

Technological scheme of wool processing. In the primary processing of local semi-coarse wool raw materials, the general indicators of the raw material are taken into account. Separate processes are also selected for fine-fiber and semi-coarse wool. Each machine in the technological system processes the product step by step on a conveyor basis and then prepares the raw material for the subsequent processing process. There are a bunch of different typs wool softening machines, and now we can see that they are very out of date. We, young researchers, must improve old machines as much as possible and, most importantly, bring them to an energy-efficient state. For the reason that today, not only in Uzbekistan, but also throughout the world, there is an increase in the cost of energy. Returning to the topic of our article, softening machines used in the world differ in their structural structure and efficiency.



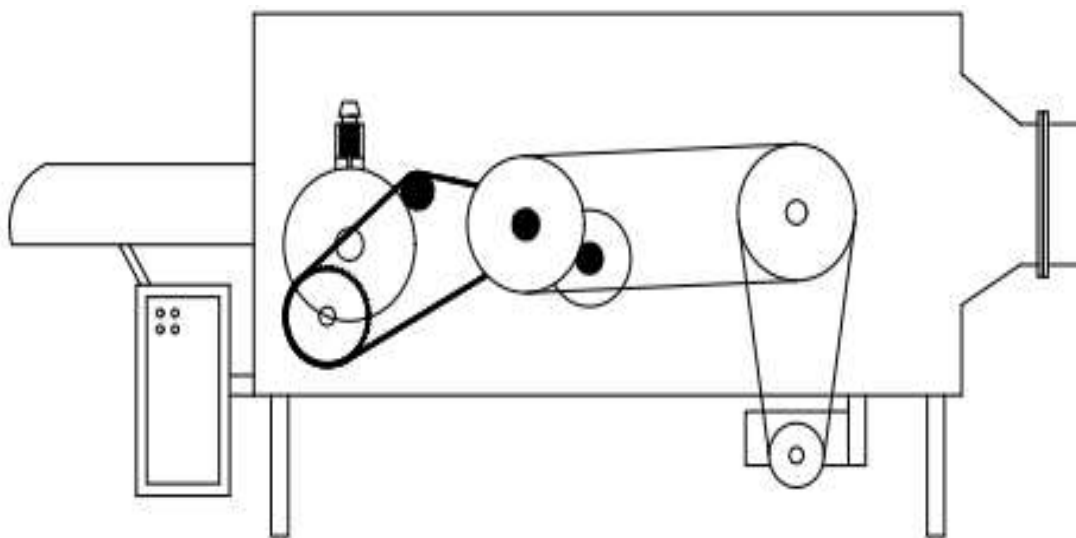
(Picture -1) 3D format of the wool softening machine.

Cleaning machines (Wool softer 2025) play a great role in the primary processing of wool. Why? As the cleaning machine is designed to soften and clean 25-35% of wool contamination. If the wool raw material is well softened, then washing the wool will be effective.

As a result of mechanical action, the wool is sheared and cleaned. Here it is mandatory to pay attention to the type of wool. Otherwise, the mechanical action on the raw material will lay waste its natural properties. As a result, poor-quality wool can be used in the spinning industry. We know the fact 100% true.

To a limited extent cleaned wool is fed to the feeder of the softening machines. The structure of the rollers is opposite to each other and can be in the form of a relief with a certain micron diameter and smooth. There are several types of power supply, we used an energy-saving one (Dusel company). The most common device consists of two pairs of parallelepipeds

a): the first pair has a corrugated cylinder, the second has a corrugated upper roller, and the lower one is smooth. The diameter of the rollers is 100-150 mm. Both pairs receive a load to increase the compression of the fiber. The speed of the second pair is 12-15% higher than the speed of the first pair, which ensures the elongation of the wool fibers. The ridged surface of the rollers helps to better compress and hold the fibers, and the smooth surface reduces the possibility of wool wrapping.



(Picture- 2) Forms of a wool softener machine

The device (Wool softer 2025) consisting of a pair of feeding rollers (Fig. 2, b) does not differ in operation from the old one, but prevents the wool pieces from being pulled out and injury. If the fibers are not sufficiently compressed, the roller parts can pull out the wool pieces that have stuck together. Such a feeding pair holds the wool layer tightly until it is completely softened; when the roller teeth release the front part of the existing wool, the backs are in the hold of the rollers, or the feeding rollers are pulled out of the teeth and removed from the roller. The upper roller has a strong load. The diameter of the rollers is 150-250 mm. In the process, the upper roller is cleaned of wool by special roller pegs; on the lower roller, the wool pieces move under the influence of the roller teeth, after which a special cleaning roller is installed to clean it, despite the fact, this does not exclude the possibility of no straight long wool on the lower roller.

The purpose tasks of the working bodies of softeners are as follows.

To begin with, the shape of the piles, their dimensions and frequency of placement in the roller affect the results of stripping and cutting, as well as the safety of the fibers during this processing. The shape of the piles is selected taking into account the out-and-out breaking load of wool fibers of different fineness and the degree of breakage (density) of the piece. In the form of section, they are differentiate by straight (cylindrical, conical, oblique) as weel as curved.

According to the results of research on wool softening and the development of improved types of its technologies, the following conclusions were drawn. The process of double cleaning

of wool with a special liquid and subsequent softening was theoretically studied. The regularity of the movement of the working structures of the chamber, which affects the softening efficiency, was determined. Cases of a decrease in the density of the wool during the initial impact of the pile drum on the surface of the drums and an increase in the linear density of the movement of the wool density were identified. Studies have shown that after the pile drums, the porosity of the wool doubled, and the density of the wool doubled.

As a result, the contamination of the wool became passive, and the efficiency improved due to the addition of weeds to the wool surface. The interaction of the wool with the working surface during the softening process allows you to increase the cleaning efficiency and cleaning efficiency. Increasing the cleaning efficiency of the machine in the sections of the pile drums and increasing the linear speed of special rollers leads to a decrease in cleaning efficiency.

In our republic, physical and mechanical processing of natural wool fiber and the production of valuable products occupy one of the leading positions. In addition, the main share of wool fiber production in the world falls on Australia, the USA, China, Russia and European countries. This is because the wool of sheep in these countries is very soft and can be processed by 95-98%. It is worth noting that in the above-mentioned countries, wool is grown and processed from "merino" sheep. Obtaining high-quality fiber from wool requires the production and sale of valuable products through effective cleaning of small and large impurities. In this regard, modern technologies are used in neighboring countries for the processing of local semi-coarse wool and the production of various yarns. Currently, increasing the volume of production in the wool and karakul sectors in our republic, and producing textile products based on technologies that meet world standards, are of great importance.

Straight conical and cylindrical piles penetrate well into the wool mass and easily leave it. The impact is applied to the flattened surface of the piles and they do not break the fiber. Wool of this shape is endorse for fine and semi-coarse wool, they are considered to have less softening and a lower breaking load.

Without error placed piles have a cone-shape and three sharp edges, which reduces the ability of the pile to shrink. The working side of the body is sama narrow, so it easily penetrates the dense mass of wool and cuts it like a cutting tool. The split face has a stronger effect on the fiber than the conical and cylindrical, so when pulling together tufts of wool, fiber breakage and damage occur In fact: (Wool Materials) Photography. P. \V. Cunliffe. Phot. J., 1935, 75, 439-444 A.n illustrated account is reported of the applications of photography in the examination of the structure of ,vool fibres and of defects in cloth. Fluorescence and infra-red effects are included.

In conclusion, Efforts to develop the country's economy and ensure employment are rapidly developing . one At that time , we were young. Researchers are responsible for creating new technologies and explaining them to the younger generation in a constructive way, providing theoretical and practical training . we go necessary The wool softening machine we recommend is fundamentally different from other machines because it has the ability to soften wool locally using a special liquid. I hope that from this article you do not understood that a bunch of information will not be disclosed, and I will try to explain this in more depth in my next articles in the future. Here we offer to find the optimal structure of the fabric, calculation of selection of geodesic lines. Now we'll determine exertion of threads at inner pressure. For this the main laws of mechanics of deformed hard body and equations of mathematic physics are used. The purpose of writing this article is to improve our knowledge during the doctoral (PhD) studies as well as to deliver this article to the next generation in a foreign language.

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