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**TECHNOLOGY AND EQUIPMENT
OF PRIMARY COTTON
PROCESSING**

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ANNOTATION

The manual is written in accordance with the curriculum of the course "Technology and equipment for primary cotton processing" and is intended for university students, industry workers and students of advanced training courses.

This manual with the teaching of special subjects, such as "Technology and equipment for primary cotton processing", for students through a foreign language. This comprehensive training of special subjects and language is called -CLIL.

CLIL refers to situations in which subjects or parts of subjects are taught in a foreign language for dual purposes, namely: content learning and simultaneous learning of a foreign language.

The manual provides information on the culture of cotton; procurement, acceptance and storage of raw cotton; cotton processing at cotton ginning plants; technological operation transportation of raw cotton; drying of raw cotton; cleaning of raw cotton; technological operation of cotton ginning; technological operation lintering of cotton seeds; technological operation processing of fiber and fibrous waste; technological operation of packaging of fibrous products at a cotton plant; standardization, certification of cotton products and mechanization of labor-intensive works of the cotton plant.

The manual uses modern technology and equipment for processing cotton. Information about foreign experiments on cotton processing is also given.

ANNOTATSIYA

O'quv qo'llanma «Paxtani dastlabki ishlash texnologiyasi va jihozlari» kursining o'quv rejasiga muvofiq ishlab chiqilgan bo'lib, OO'Yu talabalari, sanoat xodimlari va malakali kadrlar tayyorlash uchun mo'ljallangan.

Ushbu o'quv qo'llanma maxsus fanlarni, ya'ni «Paxtani dastlabki ishlash texnologiyasi va jihozlari» fanini ingliz tilida o'qitishda katta yordam beradi. Bunday umumiy o'qitish CLIL deb nomlanadi.

CLIL bu, maxsus fanlarni, hamda maxsus fanlar qismlarini ingliz tilida o'qitishdagi vaziyatlarda qo'llaniladi, ya'ni maqsad fanni ikki tomonlama o'qitishdir: fanni o'rganish va bir vaqtda xorijiy tilni o'rganish hisoblanadi.

O'quv qo'llanmada g'ozga o'simligi haqida ma'lumot; Paxta xomashyosini qabul qilish, tayyorlash va saqlash; Paxta tozalash korxonalarida paxta qoyta ishlash; Paxta xomashyosini tashish; Paxta xomashyosini quritish va tozalash; Paxta xomashyosini jinlash va linterlash texnologik jarayoni; Chigitni linterlash texnologik jarayoni; Tola va tolali chiqindilarni tozalash texnologik jarayoni; Paxta zavodida tolali mahsulotlarni toylash texnologik jarayoni; Paxta mahsulotlarini standartlashtirish, sertifikatlash va paxta tozalash korxonalarida sermehnat ishlarini mexanizatsiyalash.

O'quv qo'llanmada paxtaga dastlabki ishlash bo'yicha zamonaviy texnika va uskunalardan foydalanilgan. Shuningdek, paxta tozalash bo'yicha xorijiy tajribalar haqida ma'lumotlar berilgan.

АННОТАЦИЯ

Учебное пособие написано в соответствии с учебной программой курса «Технология и оборудование первичной обработка хлопка» и предназначено для студентов ВУЗов, работников отрасли и слушателям курсов повышения квалификации.

Это учебное пособие касается преподавания специальных предметов, например таких как «Технология и оборудование первичной обработка хлопка», для студентов через иностранный язык. Это комплексное обучение специальных предметов и языка называется -CLIL.

CLIL относится к ситуациям, в которых предметы или части предметов преподаются на иностранном языке с двойственными целями, а именно: изучение содержания и одновременное изучение иностранного языка.

Учебном пособие даётся сведения о культуре хлопчатника; заготовка, приемка и хранение хлопка-сырца; переработка хлопка на хлопкоочистительных заводах; технологическая операция транспортирование хлопка-сырца; сушка хлопка-сырца очистка хлопка-сырца; технологическая операция джинирование хлопка-сырца; технологическая операция линтерование хлопковых семян; технологическая операция переработка волокна и волокнистых отходов; технологическая операция пакетирования волокнистой продукции на хлопкозаводе; стандартизация, сертификация хлопковой продукции и механизация трудоемких работ хлопкозавода.

В учебном пособие использовано современные технология и оборудование переработки хлопка. Атакже дается информация о зарубежных опытах по переработки хлопка.

INTRODUCTION

The cotton growing and cotton ginning industry occupies a central place in the economy of the Republic of Uzbekistan. The reforms implemented by the government in the cotton industry were an important element in the planned development of the country and its transition to a market economy.

The country is implementing comprehensive measures to develop the cotton industry, modernize and modernize cotton ginning enterprises, improve the profitability of production and processing of raw cotton, as well as competitiveness of manufactured products.

The main products of the cotton ginning industry – is cotton fiber - are competitive in the world market for technical products. Revenues from its sale on the international market are important articles of foreign exchange earnings to the budget of the Republic of Uzbekistan.

Thanks to large volumes of the cotton fiber production, Uzbekistan is a leading participant in the global cotton industry, ranking sixth in manufacturing and fifth in its exports. The growth in the export price of cotton fiber was partially offset by a reduction in the volume of its exports. The volume of exports of cotton fiber declined due to a combination of factors such as a partial reduction in cotton production and intensive development of the domestic textile industry.

Significant reforms were implemented by the government in the structure of the cotton-cleaning industry of the republic. Improving the mechanisms for selling raw cotton and fiber, improving the technology of seed seed preparation and primary processing of cotton affected the substantial increase in the range of cotton fiber, lint and seeds produced. The large-scale program of modernization and reconstruction of enterprises of the cotton ginning industry, adopted by the Government for 2007-2011, made it possible to strengthen the technical and economic situation of the cotton ginning industry.

Over the years of independence, significant changes have been made in the evaluation of fiber quality. The Center of "Sifat" gradually implemented a wide range of works on the development and modernization of the national classification system, test methods and the transition to the determination of qualitative parameters of cotton fiber in accordance with the indicators adopted in the world practice.

Over the years of independence, the industry has technically re-equipped almost all ginneries with full or partial equipment upvarietys. Beginning from 1993 to 2015, 95 cotton growing plants were reconstructed, modernized and rendered beyond the city limits. A powerful impetus in this work was the implementation of the Program for the Modernization and Reconstruction of Cotton ginning industry in 2007-2011, adopted by the Cabinet of Ministers Resolution №70. According to the program, modernization and reconstruction projects in 41 cotton factories were successfully completed, which significantly increased the efficiency of the industry. To date, almost all enterprises have an updated equipment, rational technology, a compact location of production areas, an orderly infrastructure.

In the cotton ginning industry, to ensure timely and high-quality primary processing of cotton, the following basic processes are used:

- drying of raw cotton;
- cleaning of raw cotton;
- separation of fiber from seeds - ginning;
- separation of lint (short fiber) from seeds - lintering;
- cleaning cotton fiber and lint;
- processing of fibrous waste;
- pressing fiber, lint and fibrous waste into bales;
- treatment of sowing seeds of cotton.

The level of technical equipment of the cotton ginning industry is continuously growing, the technological process of primary cotton processing is being improved, and automation is being introduced to manage the process.

A complex of works on acceptance, storage, transportation and processing of raw cotton, preparation of cotton seed, a modern production of high-quality cotton products meeting the requirements of international standards is being created.

Questions are being resolved on the organization of accounting and control over the reliability of data on the quantity, quality and grade of raw cotton taken from agricultural producers, the yields of cotton fiber and cottonseed, the quantity and quality of cotton fiber produced and marketed by cotton ginning plants through the widespread introduction of modern information and communication technologies.

Chapter I

CULTURE OF THE COTTON

1.1. General information about cotton and its processing products

Cotton - the oldest cultural plant, appeared almost simultaneously with the birth of agriculture. The native land of cotton is India, China and Egypt.

Cotton is a perennial plant, belongs to the botanical genus *Gossypium*, the Malvian family; its individual forms are year-round fruiting, perennial shrubs and even trees reaching 5 -7 m height. In culture, mostly low-growing forms are used - an annual plant.

The culture of cultivation of cotton leaves in a deep antiquity - the era of the Paleolithic. The birthplace of cotton is India, many thousands of years ago, as stated in the Indian laws of Manu, clergymen used to decorate their divine robes with mesh gowns made of cotton thread. The ancient Greek historian Herodotus (V at.BC.e.) wrote that the ancient Hindus wore clothes made of cotton fiber collected from wild plants, then this fiber was called wood wool. India was the cradle of cotton, from which it spread westward to Iran, Turkey and to the east - to China and Japan. In Egypt, cotton was cultivated during the reign of the pharaohs. Tradition says that the kings of ancient Egypt put cotton on one scale, and gold on another. According to historical documents on the territory of the Central Asian republics in Iran and Arabia, cotton is cultivated from VI – V c. BC. In America cotton growing has developed independently of the countries of the Old World, here one can name several centers of the ancient cotton culture in Peru, Guatemala, Mexico. Industrial production of cotton began to develop in the 17th - 18th centuries AD.

Cotton is a heat-loving plant, therefore the zone of its distribution on the globe is limited by a "cotton belt" having coordinates 43-44 degrees north latitude and 40-41 degrees south latitude.

For industrial production, the predominantly low-growing forms are used - an annual plant that guarantees annual harvesting. Of the 35 types of cotton, four species of the genus *Gossypium* have industrial application: *hirsutum* (Mexican), *Barbadense* (Peruvian), *Arboreum* (Indo-Chinese) and *Herbaceum* (Afro-Asian) Fig.1.1, 1.2, 1.3, 1.4, 1.5. The most common in the Central Asian region are the first two species, known as medium-fiber and fine-fiber varieties.

Each type of cotton has a large number of breeding varieties. Selective variety of cotton is a group of plants possessing a persistent heredity, having a common origin, the same morphological and economic features.

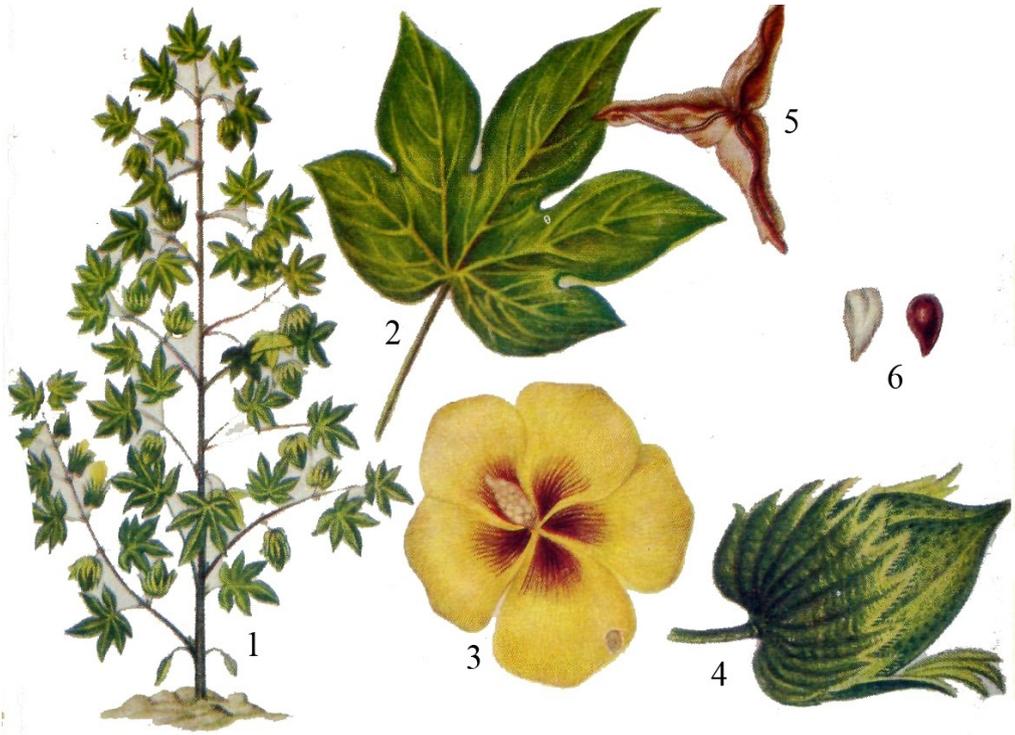


Fig. 1.1. Kind of cotton *Gossypium herbaceum*
 1- cotton ; 2- leaves ; 3- flowers; 4- box; 5- sash; 6- seeds.



Fig. 1.2. Kind of cotton *Gossypium arborum*
 1- cotton ; 2- leaves ; 3- flowers; 4 , 5- box; 6 - sashes; 7 - seeds.

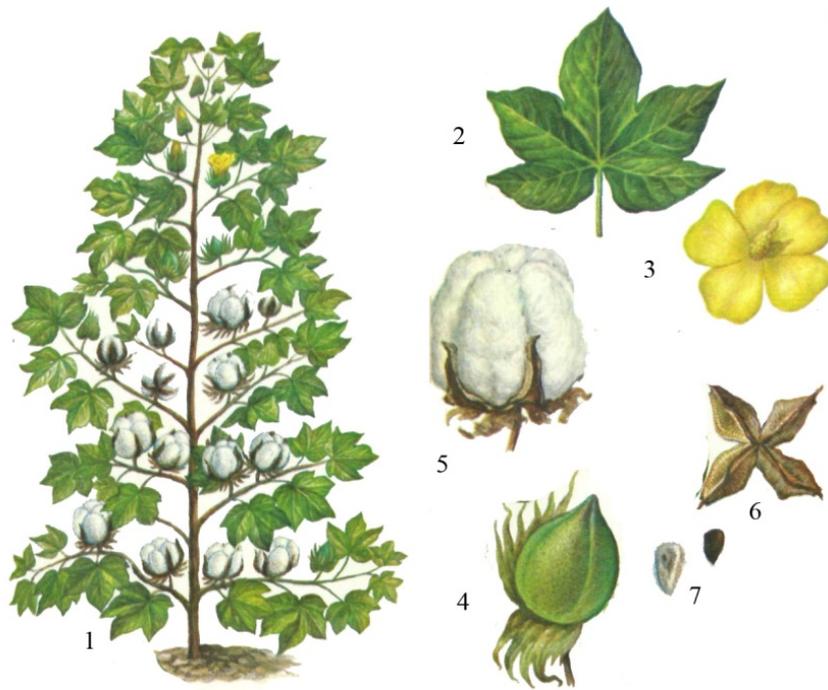


Fig. 1.3. Kind of cotton *Gossypium hirsutum*
 1- cotton ; 2- leaves ; 3- flowers; 4 , 5- box; 6 - sashes; 7 - seeds.

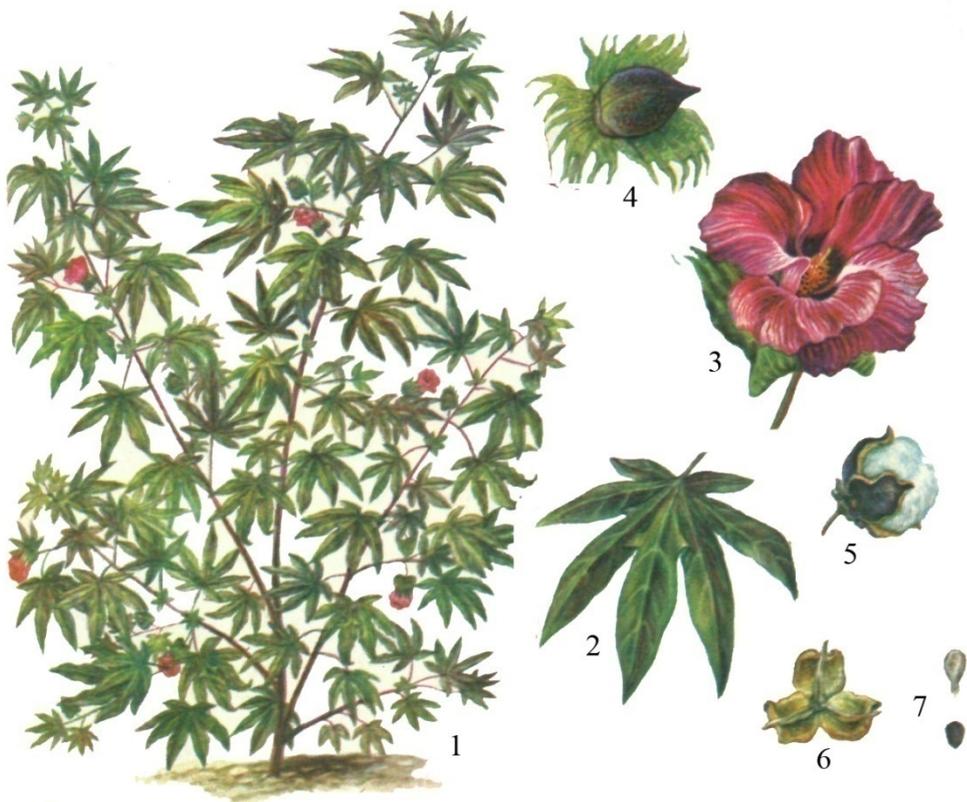


Fig. 1.4. Kind of cotton *Gossypium trilobatum*
 1- cotton ; 2- leaves ; 3- flowers; 4 , 5- box; 6 - sashes; 7 - seeds.

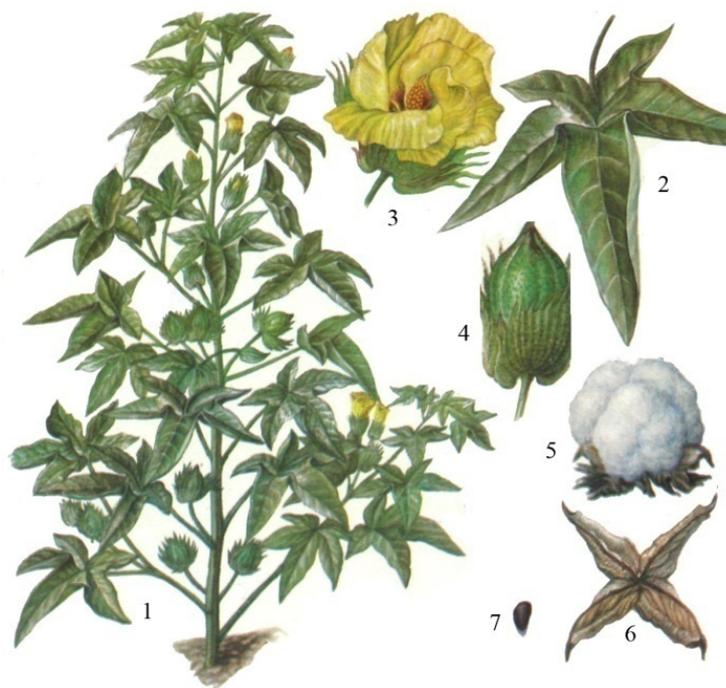


Fig. 1.5. Kind of cotton *Gossypium barbadense*
 1- cotton ; 2- leaves ; 3-flowers; 4 , 5-box; 6 - sashes; 7 - seeds.

According to the external (morphological) form, cotton is a well-branched bush with a height of 0.7 to 1.5 m., consisting of the main vertical stem (monopodial branch) and branches that branch off from it (simopodial branches - fruit), which carry leaves and flowers, from the latter are formed boxes of cotton. The period of development (vegetation) of cotton from sowing to harvesting in Central Asia continues for 100-150 days. A sufficiently large gradient of the vegetation period runaway is due to climatic conditions, since cotton should receive a sufficient amount of thermal energy to form a mature fiber. Cellulose is the carrier of the mechanical properties of the fiber, therefore, with the increase in the maturity of the fiber, its strength increases under the influence of internal, elastic forces, the fiber acquires a crimp, which determines its main valuable spinning property.

Of the 35 known cotton species, the next four are of industrial importance and have received a predominant distribution: *Gossypium hirsutum*, *Gossypium barbadense*, *Gossypium arborum* and *Gossypium herbaceum*. Uzbekistan grows two species - *Gossypium hirsutum*, *Gossypium barbadense*.

In appearance, the cotton plant is a well-branched bush, an average length of 0.7 to 1.5 m. The bush consists of the main vertical stem and the branches that branch off from it, which bear the leaves and flowers from which later the boxes of cotton are formed.

The sown cotton seed begins to germinate if the temperature of the soil is 12 - 14, and the air temperature is 15 - 20°C. Depending on the soil temperature, cotton seedlings appear 5 to 12 days after sowing. Approximately 10 days after this, the first real sheet is formed. In the process of vegetation, after the appearance of leaves on the 5th and 8th, in the sinus of each leaf of the main stem, first a monopodial (growth) bud is laid, and then a sympodial (fruit) bud, from which shoots grow, i.e. normal branching of cotton begins. On the 45th to the 50th day after the shoots,

budding begins and after 25-30 days the flowering of the cotton. The capsule ripens and opens on average 45 to 60 days after flowering, hence the full period of cotton growing, depending on its selection variety, lasts from 100 to 160 days. (Fig . 1.6)



Fig. 1.6. Cotton field

The development of fiber and seeds is accompanied by the growth of the capsule, which is divided into 3 to 5 leaves inside. Each leaf contains 6 to 9 seeds with many attached fibers. The contents of each individual leaf are called a lobule, and a separate seed with fiber not separated from it is volatile. Capsules are spherical or ovoid in shape with medium height 60 mm and the largest diameter is 50 mm. The cotton raw cotton weight of one mature capsule of medium-fiber cotton is 5 -7 grams and fine fiber 3 - 5 grams. Seven to 15 thousand fibers develop on one seed (Figure 1.7).

Cotton is one of the most valuable types of raw materials, from which up to 300 types of consumer goods, technical and special purposes, are produced. Of 100 kg raw cotton of the first varieties on average receive at least 35-36 kg spindle fiber, sufficient for the production of 3000 m cloth, 6- 8 kg lint (which fiber and podpushki), 11 kg oil, 2.5 kg soap, 2.2 kg cake, 13.6 kg husks for the hydrolysis industry or feed for livestock and 3-4 kg other products.

Cotton fiber serves as the main type of raw materials for textile, knitting and other industries of light industry. It produces a variety of fabrics (linen, gauze, chintz, cambric), sewing thread, cotton wool, artificial silk, fishing tackle, various technical products (electric winding, cords used in the automotive industry, filters, drive belts, artificial leather), and much more.



Fig. 1.7. Fruit parts of cotton

Cotton seeds contain 20-25% vegetable oil - a valuable food product. In turn, cottonseed oil is used for cooking margarine, toilet soap, glycerin, stearin, various technical oils and a number of other products.

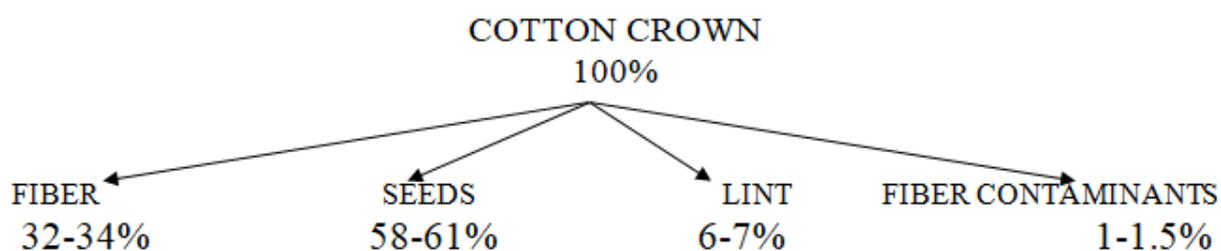
The husk and oil cake remaining after the separation of the oil is a valuable food for livestock. The husk is also used to produce tanning agents, cardboard, coarse paper varieties, varnishes, electrical insulating materials.

The main technological features of fibrous products are: fiber length, mm; fiber fineness, μm ; degree of attachment of fiber to the seed, pl. For long-fiber and medium-fibrous varieties of cotton, these indices vary considerably among themselves, as can be seen from Table 1.1

Table 1.1.

Index	Medium-fibred	Long-fibred
l , mm	28-34	38-45
t , u	20-40	10-15
S , mn	21-24.4	10-15

Cotton is very important for the national economy. There is no single branch of the national economy, wherever cotton or products of its processing are used. The following products are obtained from the cotton raw cotton factory:



As a result of primary processing of raw cotton, cotton fiber is produced. Yarns are made from fiber, yarn from thread and then all kinds of fabrics. Cotton seeds produce oil, glycerin, soap, drying oil, oil cake, vitamin E, etc. (Figure 1.8).



Fig. 1.8. Produced products from cotton

1.2. Stages of development of cotton processing

The cotton-cleaning industry is organically linked with agriculture as a supplier of raw materials, as well as with textile, fat-and-oil, chemical and other industries as consumers of finished cotton products, where cotton fiber, cotton lint, seeds and fibrous waste are produced from raw cotton. In terms of the quantity and value of the products, cotton ranks first among agricultural technical crops. The history of the emergence of the cotton ginning industry - one of the leading and oldest branches of Uzbekistan - is inseparably linked with the features of the appearance of the first sprouts of the capitalist way based on feudal society.

The basis of industry in Central Asia in the 18-19th centuries was agriculture. Labor skills, ability to grow field, garden and garden crops were highly developed

among the rural population, where the main crop was cotton. In all areas of Central Asia, during this period, there was a great demand for fabrics made by Uzbek craftsmen, there are many reports from merchants walking along the Great Silk Road. Urban artisans, at this time, used the improved Indian chaarkhas (fiber separators) to produce fiber, - Central Asian "chigiriki", where raw cotton was passed through corrugated rolls, one of which rotated, dragged the fiber between the rollers. The performance of such a device was about 8 kg. raw cotton per day. Such a primitive, home-based way of processing cotton held back the development of textile crafts. The invention of the fiber-separating machine (gin) by the American teacher E. Whitney in 1792 and the concentration of primary cotton processing at the cotton ginning plants greatly contributed to the development of industry. At the end of the 19th century, intensive construction of railways was launched in Central Asia, which stimulated the development of the cotton-cleaning industry due to increased trade with other countries. The increase in the production of raw cotton required a high-performance mechanized cleaning, in connection with which, in 1881, the first cotton plant was built in Tashkent, which had two wooden gins (jingauz) driven by a water wheel and a hand press. By 1890, there were already 40 cotton factories in Central Asia, and by 339 by 1917. However, it should be noted that all handy, labor-intensive works were performed manually, in the absence of basic working conditions and sanitary hygiene. The entire industry during this period was focused on the export of goods, which determined its colonial character, and the cotton-ginning industry was completely subordinated to the cotton industry of the metropolis.

In the first half of the 20th century, as a result of the creation of a domestic machine-building base in Uzbekistan, a fundamental reconstruction of the main technological equipment was carried out at the cotton factories - American samples were replaced by domestic ones, which ensured economic independence for the Republic. During this period, there was complete electrification of cotton factories and zatotpunktov, developed tools for mechanization of labor-intensive work. The second half of the 20th century was marked by an increase in the volume of harvested raw cotton, which led to the further development of the cotton ginning industry. During this period, mechanization of technological processes was carried out, effective production lines and equipment for cotton processing, automatic control equipment were developed.

The acquisition of independence by the Republic of Uzbekistan and its access to the world market, has given a new powerful impetus to the development of the cotton ginning industry. Today Uzbekistan occupies the sixth place in the world for the production of raw cotton and the second largest export of cotton fiber. She is a full member of the ICAC (International Consultative Committee for Cotton), as well as major exchanges for the sale of cotton fibers (Liverpool, Bremen and Gdansk). Samples of Uzbek cotton fiber were adopted and approved by the International Association and the Quality Arbitration Committee as meeting international standards. Our Republic grows 3.1 to 3.2 million tons of raw cotton a year on average. In the cotton ginning industry there are 98 cotton factories, more than 430 procuring points,

All cotton growers are open joint-stock companies and withdrawn from state jurisdiction. New economic relations required a rethinking of the technological policy

in the field of raw cotton processing, there was an urgent need to develop efficient technologies, reduce the number of equipment in the technological process while maintaining the quality of the product. In recent years, there has been a steady trend in industry in this direction - a radical modernization of a number of cotton factories has been carried out, with a significant reduction in transport communications. Cotton plants have become compact on a territorial basis, fully mechanized and environmentally friendly. The Government of the Republic pays considerable attention and support in the development of science and training of personnel for the industry.

At the cotton plant, there are five main zones, each of which fulfills its specific technological tasks. The presence of these zones also determines the normal functioning of the cotton plant as a whole.

1.3. Selection and seed production of cotton

Selection is the selection of cotton that meets the requirements of individual or complex quality technological and economic indicators. Breeders are working to create such varieties of cotton that will meet the requirements of agriculture. Selection is the selection of cotton that meets the requirements of individual or complex quality technological and economic indicators. Breeders are working on the creation of such varieties of cotton that will meet the requirements of agriculture and industry: high-yielding, productive, early-maturing, resistant to diseases and pests, with large boxes,

Early maturity is determined by the number of days from sowing until the opening of the boxes.

Yields are determined by precocity, the size of the boxes, the rate of maturation, susceptibility to fertilizers, water demand, resistance to diseases and pests.

The size of the capsule depends on the number of lobules in the capsule, the number of individual volatils (seeds with fiber) in the lobule, the mass of seeds and fiber on the seed.

In industrial varieties of *Gossypium - hirsutum* species selection (Fig.1.9, 1.10), the weight of the capsules varies from 3-5 to 8-10 g or more; in *Gossypium barbadense* varieties, it varies from 2.0 to 4.5 g.

Resistance to pests and diseases makes it possible to increase not only the yield, but also the quality of cotton fiber and seeds. One of the most common types of diseases, especially the varieties of Soviet medium-fibrous cotton *Gossypium hirsutum* - verticillium wilt - in and l.

The variety of long-fiber cotton *Gossypium barbadense*, whose distinctive feature is yellowing and discoloration of veins of cotyledonous and real leaves, are affected by such diseases as macrosporiosis, characterized by black lobules during maturation, and black root rot. With a strong lesion of the capsules, the disease passes to the fiber. Seeds turn out to be immature.



Fig. 1.9. Selection variety C-6524



Fig. 1.10. Selection variety Bukhoro-6

1.4. Diseases of cotton

Root rot is one of the types of dangerous diseases of cotton in all areas of cotton growing, especially on heavy clay soils with a close groundwater stand.

Gummosis, or bacteriosis, appears on the leaves of cotton in the form of oil spots of angular shape. Bacteria affect the whole plant of cotton: cotyledons, leaves, stem, capsules, seeds. Such a plant lingers in growth and often dies.

One way to combat cotton diseases is the cultivation of high-quality, disease-resistant selection varieties of cotton.

When breeding new selection varieties of cotton sometimes use the method of mass selection, which is reduced to a simple selection of varietal mixtures of the best plants on the basis of which improvement is planned. In such a case, the entire crop from such plants is collected separately. However, mass selection is rarely used because of its low efficiency, it is usually used to restore a clogged selection variety.

The most effective method of analytical selection is the method of individual selection. At the heart of this method is the selection of the best plants from natural material, separate sowing of the offspring of each selected plant and their evaluation

for several years, taking into account the ability to transmit their characteristics by inheritance. Subsequently, among the offspring, homogeneous, most valuable families are selected for further testing and reproduction.

A method of breeding new varieties inside and interspecific hybridization is widely used in selection work.

For the creation of new breeding varieties, plants of one or different species are often crossed. This method consists in the following: artificially pollinating plants of one species (or variety) with pollen of another species, as a result of which a new variety is formed with its qualitative indicators inherited from the parents. After selection, usually from the second generation of the hybrid, a uniform, cotton-resistant variety is obtained.

Seed production is one of the most important special sectors of cotton growing, whose task is to multiply, preserve, improve and introduce new varieties of cotton into production, and provide cotton-growing farms with the most productive, high-quality seeds adapted to local soil and climatic conditions.

The deterioration of the varietal qualities of the seeds and, as a result of this technological properties of the fiber, is due to the low varietal purity of the seed fund, the sowing of a large number of varieties in one farm, the mechanical mixing of seeds of different varieties, the inability to produce high-quality seeds, and the lack of timely and correct replacement of low-variety seeds with higher variety.

For multiplication of new varietal seeds and preservation of the purity of the seeds of the sowing selection varieties, complex work is carried out in elite-seed farms, which have special strong points for conducting such work.

Replacement of seeds of poor quality with improved seeds of the same variety is called renewal of the variety, and replacement of some zoned varieties with others is a variety crop.

In elite-seed farms, the seeds of the elite and the first reproduction are grown.

Elite is the selected seed of the initial genus, typical for a given selection variety of cotton plants, possessing a stable heredity and a certain leveling of morphological features, increased yield and other economic qualities, as well as having a fiber with high technological properties. The seeds of the elite must have 100% varietal purity, that is, they should not contain impurities of seeds of another variety.

Varietal renewal in cotton growing is carried out according to the five-year scheme by the seeds of the elite and its reproduction. The seeds of the cotton plant obtained from sowing seeds give the first generation of seeds, i.e. the first reproduction; seeding with seeds of the first reproduction yields a crop of seeds of the second reproduction, etc. Seeds of the first reproduction must have a variety purity of not less than 99%, i.e., an admixture of seeds not typical for a given variety is allowed, not more than 1%.

In order to provide cotton-growing farms with seed seeds of better quality, a field trial of cotton crops is annually carried out, in which specialists of agriculture establish the high-quality purity of the planted cotton variety and identify the best high-yielding areas. When approbation is determined the authenticity of the selection variety, its origin, the varietal purity of seeds, the state of crops for yield and damage to diseases and pests of cotton.

Seed, raw cotton at the best high-yield areas of approved crops is collected and surrendered by collective and state farms to procuring points separately for areas, varieties, reproductions, varietal purity, field groups and the extent of disease affected by crops.

Depending on the degree of damage to the cotton plant diseases (gummosis and wilt), they are divided into two groups. The first group includes cotton crops with up to 5% of plants affected by gummosis, and up to 10% by wilt; the second group includes plants where the damage of cotton by gummosis is from 6 to 20% and wilt - from 11 to 20%, and the damage caused by gummosis of the fetal elements - up to 1%.

On germination, the seeds are divided into three classes: 1 - with germination - Fe less than 95%; 2 - not less than 90%; 3-not less than 85%. Seeds of the 3rd class can be sown only in exceptional cases.

The energy of seed germination is the number of seeds (expressed in percent), germinated for three days.

The moisture content of the seeds is the amount of moisture contained in the seeds under study, expressed as a percentage of the initial weight of the seeds.

Seed ripeness - the number of seeds (expressed in percentage), having a darkened color of the seed nucleus from the effect of increased temperature. In such seeds the supply of nutrients is reduced, so cotton is not allowed to be sown with these seeds.

Frozen seed is the total weight of short fiber (delint) remaining on the seed after linting, expressed as a percentage of the weight of the seeds. The increased pubescence complicates the work of the sowing device of the seeder due to the deterioration of the flowability of the seeds and adversely affects the placement of plants in rows.

Mechanical damage is characterized by the presence of crushed seeds (core, peel).

Dead contaminants - a lot of earth, sand, stalk particles and leaflets of boxes, dead insects.

To combat root rot, gummosis and other diseases, cotton seeds before planting are necessarily etched (disinfected) with copper trichlorophenolate, formalin and other toxic chemicals. Seeds disinfected with formalin are soaked in running water and treated with ammonium sulfate at a rate of 5 kg per 100 kg of dry seeds. De-seeded seeds are sometimes dredged (coating with a mixture of fungicides and fertilizers with adherent material).

Disinfection of seeds prevents the disease of cotton plants, accelerates the germination of seeds and the development of plants.

1.5.Pests of cotton

A spider mite is a very common cotton pest. If the crops are damaged by a spider mite, the harvest may decrease by 50% or more. The borer quickly multiplies and for one season gives 12-15 generations. Leaves damaged by spider mites turn yellow, then die and fall off; in plants the metabolism is disturbed; fibers are glued together by mite excreta and clog the working organs of cotton pickers and cotton ginning machines.

Cotton aphids are small insects, wingless, winged, green, brown or black. Propagates as quickly as the spider mite. Aphids suck the juice out of the plant; leaves are twisted and die, the development of the plant is delayed, young shoots sometimes die. Allocation of aphids glue fibers and are the environment for the development of black fungus - a shade that further worsens the quality of cotton.

A box worm (or cotton scoop) damages buds, flowers and boxes, which mostly fall off. The caterpillar, gnawing through the box, enters inside it, which makes it difficult to fight this worm.

The winter worm eats seeds sown in the soil, gnaws at young plants stems at the base, on the surface of the earth.

Karadrin (leaf cotton worm) - a small butterfly with grayish-brown wings, which bites the stems and foliage.

An effective measure of pest control is: destruction and burning of contaminants; spraying and pollinating affected plants and other chemical crops adjacent to the cotton fields of other crops, and mulberry and acacia trees - with Parisian greens, soap alkalis, calc-sulfur broth or mineral-oil emulsions; spreading poisoned cake baits, etc.

Diseases that can hurt the cotton are divided into parasitic (bacterial - gummosis and fungal - verticillium and fusarium wilt, root rot, diseases of the capsules and fibers), viral (fiber twisting) and not parasitic (infectious mosaic of leaves, variegation, burn,) (Figure 1.11).



Fig. 1.11. Diseases of cotton

The greatest harm to plants is caused by bacterial and fungal diseases.

Gomosis is a disease widespread in all cotton-growing regions of the world, affecting all the above-ground organs of cotton at all stages of its development. On cotyledonous leaves gommosis is manifested in the form of rounded dark green oily stains, which are then brownish. On vegetative leaves between cores appear angular transparent dark green oily stains; sometimes along the main veins of the leaf are formed merging and also dark green oblong sites. Similar spots are formed on the stems, embracing them with a ring; while the development of plants slows down; sometimes they die. If the boxes damaged by gummosis will open, the fiber will be glued, and if the lesion is weak, the lobules remain unbroken (Figure 1.12).

The main source of dissemination of gummosis is the seeds and non-forbidden plant remains - guzapaya. Seeds are affected mostly from the outside; The bacteria are located on the surface and in the fibrous cover of the seed. Verticillium wilt is the most common fungal disease; it appears at the beginning of budding and flowering of cotton and especially by the end of the vegetative period. In this case, the leaves of the cotton turn yellow, become spotted, dry up and fall off; buds and ovaries fall off; the plant is dying. The fiber obtained from a cotton plant infected with a wilt has a shorter length, strength and elongation, and the seeds are underdeveloped and have a lower oil content.

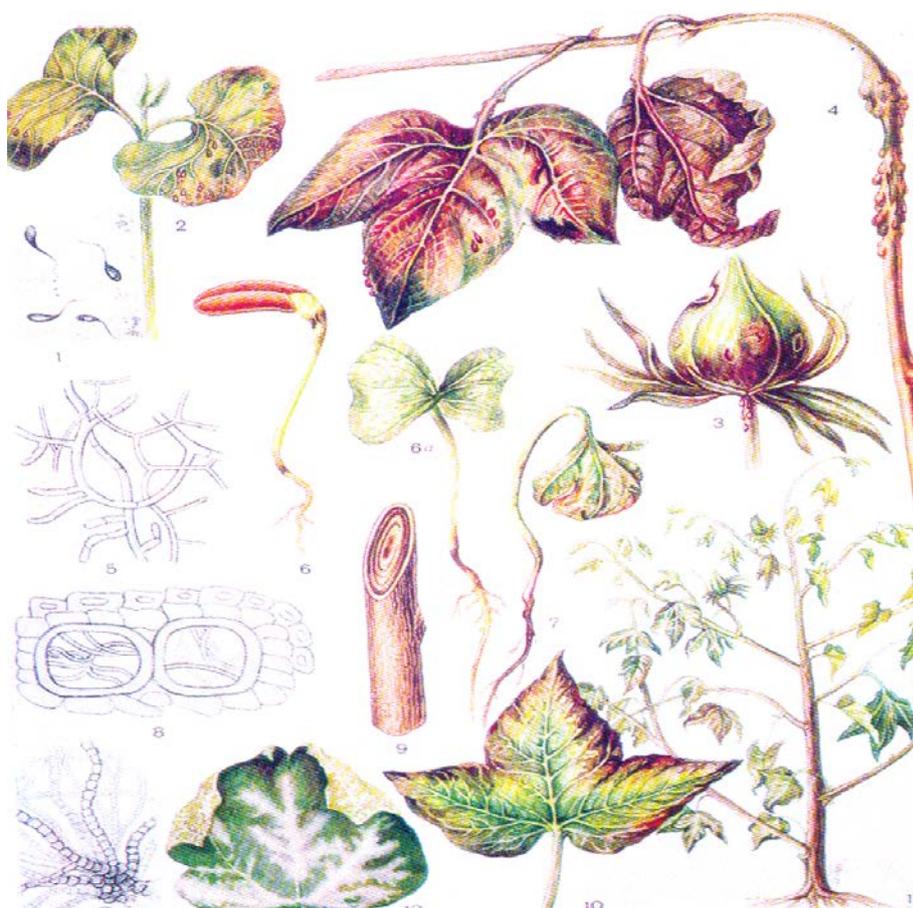


Fig.1.12. Cotton stricken with gummosis

Fusarium wilt is a disease that is inherent only in fine-grained varieties of cotton. It can cause massive death of plants.

Root rot affects cotton seedlings until the appearance of the 3-4th leaf; is not widely spread.

Effective measures to combat cotton diseases are: a high level of a complex of agrotechnical measures for cultivating cotton; introduction of crop rotation; careful preparation of sowing seeds; deducing new economically effective disease-resistant varieties of cotton.

The development of cotton with continuous flowering and fruit formation before the onset of autumn frosts leads to the formation of fruit elements that can not ripen to the harvest season. As a result of the growth of the tips of the stem and shoots from the formed fruit branches, water and nutrients are ineffective. To strengthen the nutritional and water regimes of the formed boxes, pinch the tops of the main stem and lateral shoot branches. You can also cut off the unnecessary green mass of the plant, making it easier to access the boxes of sunlight and air. Coining is carried out in one or two stages after the plant is fully formed. There are special machines for this operation.

1.6. Preparing the fields for sowing

For the normal development of cotton, therefore, to obtain high yields of cotton, light, heat, water, air and nutrients are needed. The necessary air, water and nutrient regimes of the soil are provided by appropriate treatment.

The preparation of the fields for sowing begins immediately after the harvest of the previous year. At the same time, remove the stalk of cotton, clean the fields, roads and irrigation work, carry out autumn-winter plowing, washing and spare irrigation and spring tillage.

To clean the stalk of cotton, which is a valuable raw material for the hydrolysis industry and domestic needs, special guzakorchevalnye machines are used. These machines rustle the soil at a depth of 10-14 cm, plow the stems with roots and harvest them in sheaves, and also trim the furrows; while the soil surface becomes even and withered, which contributes to the destruction of pathogens and pests.

As a result of the cleaning of fields, adjacent sections of roads and irrigation network, they eliminate pockets of possible wintering of pests, bacteria and fungi - causative agents of cotton diseases.

When autumn-winter autumn plowing the soil is loosened to a depth of 25-30 cm, due to which moisture accumulation is ensured, its stock in the soil increases 1,5-2 times and the quantity of contaminants and pests decreases.

In the plowing process, the lower, less damaged, soil layers move upward. Due to the alternating freezing and thawing of the soil, its cloddy structure is restored in the entire plow layer; improve air and water permeability and thereby create conditions for enhanced activity of microorganisms, which contributes to the increase of fertility.

If soils are saline, then after autumn plowing, flushing is carried out. In the main cotton-growing regions of the country there is a significant amount of saline land.

The main cause of soil salinization is groundwater, located close to the soil surface and containing soluble mineral salts (common salt, Glauber's salt, magnesium chloride, calcium chloride, etc.). If in soil contains from 0.5 to 1% of these salts, plants are poisoned and perish or yield low yield.

An effective measure of combating salinization and bogging of soils, in addition to washing irrigation, is the installation of a horizontal drainage network. With horizontal drainage through special channels - drains (open or closed asbestos cement or pottery pipes) salted and excess water is diverted for irrigated areas and dumped into irrigation canals. The simpler and cheaper is vertical drainage, in which wells or boreholes are dug and saline water is pumped out of them.

Spring processing of the soil consists of harrowing the soil in spring when the ripeness of the earth and the microplanning of the plots occur. Due to this, moisture is retained and contaminants are destroyed additionally. The harrowing is carried out across or along the diagonal of the field. After precipitation and crust formation, harrowing is repeated.

For fields that are not plowed in autumn, the best treatment is non-plowing with preliminary harrowing of the soil. If the harrow can not achieve a good cutting of the soil (when the latter is excessively compacted), a chisel or cultivator is used to loosen deeper soil layers before harrowing.

1.7. Crop and care for cotton

When sowing, high quality seeds are used that have a germination capacity of 95 to 100% and are processed in special shops at ginneries. This treatment consists in revealing individual batches of seeds from a pile (delint), calibration and disinfection with special chemical preparations (see Section Four).

Duration of sowing for. separate areas are different and depend on climatic and meteorological conditions. In areas with an early onset of stable warm weather, sowing ends in the first decade of April, and in the more northern areas - in the second.

The depth of seeding depends on the structure and moisture of the soil and varies within 3-5 cm. If the soil is overdrawn and the weather is hot, then the depth of seeding is 4-5 cm. Seeding of seeds in the soil by less than 3 cm is not recommended, since a significant part of the seeds will remain on the surface of the soil, and the remainder will fall into the soil layers with insufficient moisture, however, when the seeds are buried deeper than 5 cm the shoots slow down.

In general, cotton sowing is carried out in a square-nest method, with a certain amount (2-4) of seeds sown in the hole. This method makes it possible to place the plants at an equal distance between the rows and between the nests, with it the consumption of seeds per 1 ha is sharply reduced, the uniformity of the shoots increases due to easier overcoming of the sprouts of the soil crust, interrow cultivation (cultivation) is possible in two directions, the costs of manual labor for the processing of cotton. (Fig.1.13)



Fig.1.13. Brand of cultivator OK-4

With a square-nested method of planting, plants can be placed according to different schemes; the most common are the following schemes: 60x20x1-2, 60x30x2, 60x15x1, 90x10x1-2, 90x15x1-2, 60x60x3-4, 60x50x3-4, and others.

In the ordinary sowing, the seeds are sown with a continuous stream, so the shoots are obtained as a continuous dense band. As a result, plants can not develop normally, as they lack nutrients and sunlight. In the ordinary planting, the thinning of shoots is practiced, that is, the removal of an excessive number of plants.

Thinning is one of the most important agrotechnical measures and in square-nest sowing without exact seeding in one hole; at the same time a predetermined density of standing of plants (from 80.0 to 140.0 thousand bushes per 1 ha) is provided and normal conditions for their growth and development are created. Delay with the conduct of thinning leads to weakening of plants, and slowing their growth.

In the case of square-nested cotton sowing with a given number of seeds per well, a more economical consumption of seeds is ensured; if at intervals of 60 cm is consumed; 50-60 kg per 1 hectare and with row spacing 45 cm-70-90 kg, then when sowing with a given number of seeds per well, the consumption of seeds per 1 hectare decreases to 25-30 kg.

For successful growth and development of cotton, sufficient light, nutrients and moisture are needed throughout the growing season. This is facilitated by the loose state of the soil, the absence of contaminants, which absorb from the soil a large number of nutrients required for cotton, and timely irrigation.

Loosening of the soil and the destruction of contaminants is achieved by inter-row cultivation, ie, cultivation directly in rows. Cultivation is carried out by tractor cultivators with loosening and cutting organs.

Treatment of cotton should be done after watering. After watering, the soil is compacted, so its loosening is necessary, in addition, loosening contributes to the preservation of moisture. To delay cultivation after watering is to actually lose the moisture obtained by watering, and thereby damage the development of plants.

The correct combination of irrigations with inter-row cultivation should be practiced from sowing until the end of the growing season of cotton. A total of at

least 4-5 cultivation is required during the growing season; on light soils, where irrigation is carried out more, the number of cultivation can reach 6-8.

Soil moisture is one of the most important factors in the growth and development of cotton. Individual plant organs contain from the total mass of 60-90% water. For one day, 1 hectare of cotton sown area evaporates up to 130 m³ of water, which must be replenished. The amount of water given to the plant over the whole vegetation period is called the irrigation norm, and for one irrigation it is called the irrigation norm. Usually the first watering is done with the formation of 3-4 leaves, 3-4 waterings are carried out before flowering, 3-4 more during flowering and fruit formation and 1-2 watering during the ripening period; later watering delays the opening of the boxes.

One of the most important measures for growing cotton and increasing the yield of cotton is soil fertilization. The main nutrients for plants are nitrogen, phosphorus and potassium. To get 1 ton of raw cotton, you need 30-60 kg of nitrogen, 10-20 kg of phosphorus and 30-60 kg of potassium. These substances are partly part of the soils themselves, partially introduced into these soils as a result of crop rotation and, finally, are partially introduced in the form of organic and mineral fertilizers.

Mineral nitrogen fertilizers include: ammonium nitrate, or ammonium nitrate (NH₄N₃) containing up to 35% nitrogen; ammonium sulfate, or ammonium sulphate (NH₄)₂SO₄, containing 20-26% of nitrogen, urea-nitrate and calcium cyanamide. Mineral phosphorus fertilizers include: superphosphate simple (non-granulated) Ca (H₂PO₄)₂ containing up to 20% phosphorus; superphosphate granulated with the same phosphorus content; precipitate CaHPO₄ and tomaslag. Potassium is contained in potassium chloride KCl (up to 60%) and in potassium salt (up to 30-40%).

Of organic fertilizers, the main one is manure, which is applied for spring processing of soils not less than 10-12 tons per 1 ha; for greater efficiency, organic fertilizers are composted with superphosphate. The manure contains 0.5% nitrogen; 0.25% phosphorus and 0.6% potassium.

When organic fertilizers are applied, many microorganisms get into the soil, thanks to which the nutrition of the plants improves, and the mineral elements in the soil become more digestible.

For the successful cultivation of cotton and obtaining a high yield, fighting "diseases and pests that help reduce yields, the appearance of patients, undeveloped fibers and seeds, and lead to a decrease in yields and even total loss of crops is of utmost importance" (Fig.1.14).



Fig.1.14. Sprayer cotton brand KP-40

1.8. Machine and manual picking of cotton

Capsules of cotton, located on the lower tiers of the bush, open earlier, have a greater mass and better maturity fiber than those above. Boxes, located on the upper tiers of the bush, do not have time to ripen before frosts and remain undisclosed or slightly opened. Some boxes of the upper tier have time to ripen on the onset of frost, but their mass remains small, and the quality of the fiber is much lower than normal ripe boxes. Disclosure of the capsules in accordance with the development of the plant and the formation of fruit elements on it lasts 1.5-2 months, and sometimes more; for this period, naturally, the harvest season is stretched.

The capsules begin to unfold at the end of August, en masse - by mid-September with an increase in October; By the end of October there has been a decline, and in mid-November, with the onset of frost, the development of the plant ceases. The earlier the opening of the boxes begins, the fuller they will be, with a well-formed cotton. The gradual opening of the boxes on cotton makes it possible to collect cotton raw continuously, finishing harvesting the entire crop in each field for 3-4 harvesting.

The general arrangements for preparing for harvesting are: the correct arrangement of people and equipment in order to use labor resources and harvesting equipment most efficiently and to finish harvesting in the shortest possible time; preparation of transport for bulk transportation of cotton and platforms for operational work in the fields, air-solar drying of cotton, acceptance of it and sending it to harvesting stations; preparation of aprons for manual collection; repair of all machinery (cotton picking and cleaning machines, road and cartage vehicles), putting roads and bridges in order; creation of good cultural and living conditions at field camps; the development of all organizational arrangements and the conduct of instructional and technical training with assemblers.

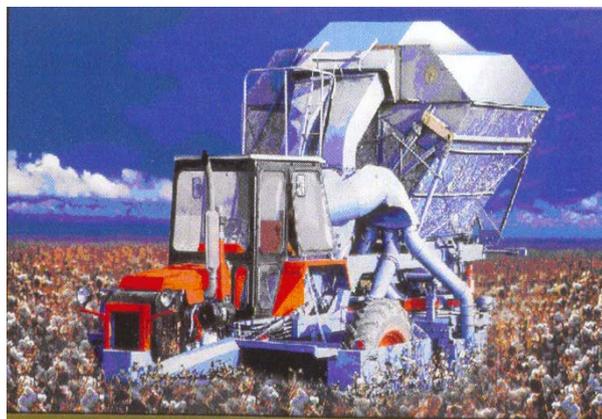
Machine harvesting (Fig.1.15) of the harvest requires particularly careful preparation of the fields. Sites for machine cleaning are taken before sowing - these are the largest and well-planned fields.

An important measure is the timely conduct of defoliation (artificial de-inoculation) and desiccation (artificial dehydration) of cotton, speeding up the opening of the boxes and increasing the percentage of fees before the onset of frost. Thanks to these measures, better ventilation and access to the sun's rays to the lower zone of the plant is achieved, rotting of the lower bolls is excluded, clogging of raw cotton is significantly reduced during harvesting, and cotton harvesting is facilitated.

As the boxes mature, the cotton harvest is collected manually and mechanically.



a



b

Fig.1.15. Cotton picking machines a) MX-1,8; b) MX-2,4

At manual gathering the collector in an apron, passing in between rows, two hands chooses from well opened boxes cotton-raw. This operation must be carried out quickly and accurately: pick cotton from the box clean, without leaflets of boxes or leaves, pieces of branches, do not leave ungrawn pieces of lobules or whole slices of raw cotton in the casements (so-called "plucking" of raw cotton). You can not collect raw cotton from a poorly opened box, not completely ripe and wet.

Control questions:

1. History of development of cotton, its types and morphological properties.
2. Geography of cotton growing, the world production of raw cotton.
3. Periods of development of cotton and agrotechnical measures.
4. Structure of fiber and seeds.
5. Products obtained from raw cotton at the cotton plant and in the industrial sector larity.
6. Infrastructure of cotton growers and technological tasks to be solved by cotton plants.
7. Necessary factors for the functioning of the ginnery.
8. General plan of the cotton plant, its main zones and their purpose.
9. Technological cycle of processing raw cotton at a cotton plant.
10. Selection and seed production of cotton.
11. Diseases of cotton.
12. Preparing the fields for sowing.
13. Machine and manual collection of cotton.
14. What brands of cotton harvesters are produced?
15. Modern methods of agricultural cotton.
16. Chasing and deflation of cotton.

Chapter II

STORAGE , RECEPTION AND STORAGE COTTON - OF RAW

2.1. Cotton procurement stations

The duties of the cotton procurement centers WMO DYT: acceptance of raw cotton grown collective and sovho Zami, determine its variety and quality indicators, as well as the mass of cotton adopted. After acceptance of the cotton storage place and ensure its safety as required otgru zhayut it to ginneries for processing.

Raw cotton is delivered to the storage place special car trains as part of the tractor and two - four dump trucks governmental trucks. Cotton is transported either directly from cotton harvesters or from farms.

To determine the net weight of the raw cotton to be received at the harvesting stations, a truck scale is installed on which the cart with cotton is first weighed, and then after the unloading of the cotton, the weight of the trolley (Fig . 2.1) . The difference between the weight soi trolley with cotton and weighing the empty trolley, and there is a net weight of the received cotton.



Fig. 2.1. Modern method of acceptance of raw cotton

When weighing bogie with cotton goods manager classifier selects several cotton samples and these samples determines podvezennogo variety cotton, comparing it with a reference E standard, available on all storage place. Then the samples of cotton is folded for each deliverer cotton in separate metal container

with a tight fitting lid and from the layers control the storage place in a technological laboratory for op -determination of physical debris and moisture taken cotton.

Moisture cotton determined equipment with VHS oven and Uz-7, and cotton contaminants determined 2L-12M or LKM.

Instead of the currently used at procurement centers, the thermovolume of VHS will be introduced in the near future, the modernized thermal-moisture meter VHS-2 and new LKM-2 instrument was used to determine the contamination of raw cotton.

All data on the quantity of cotton taken, its varieties, the commodity-classifier transfers to the accounts department of the procuring item. There, too, data are transmitted from the technological laboratory on the actual moisture content of the clogging of cotton. On the basis of these data, the bookkeeping department of the procurement office determines the cotton's conditioning mass, calculates its cost, which it lists to the collective and state farms.

The most important task of procuring points is to ensure the preservation of the natural properties of raw cotton taken.

It was mentioned above that raw cotton of the engine group of the first group is taken as procuring points with field humidity and contamination, and the second group is taken with a maximum moisture content of up to 22%. With such moisture, cotton is not subject to storage, since in a short time its self-warming begins, at which the quality of fiber and seeds deteriorates sharply. The strength of the fiber decreases and its color changes. Seeds, reduce their oil content and become unsuitable for the production of edible oil. You can not also store cotton with increased clogging, as the leaves and branches in raw cotton are crushed and easily linked to the fiber during storage. Separation of impurities becomes more difficult.

To ensure the safety of cotton at harvesting sites, it is dried and cleaned in special drying-cleaning (DCS). In these shops, the moisture content of cotton should be brought to the standard (the basic rate), ie, depending on the type of cotton to 9.5-13%, and the contamination to 1.5-3.6%. With such humidity and clogging, it is possible to preserve cotton in riots and warehouses without the danger of spoilage.

The procurement centers are of two types: factory-owned, which are located at ginneries, and non-plant, which are located at a distance of 15-50 km or more from the factories.

Cotton storage areas, warehouses, drying-cleaning shop and other buildings on the procurement site are located in accordance with the flow of processing cotton raw. Such arrangement of buildings provides for the fireproof preservation of cotton and proper transport flows.

At the factory procurement centers, the cotton received is sent for processing to the plant. Out of the factory procurement items cotton is exported to the factories as necessary.

2.2. Acceptance of raw cotton

There are the following rules for the acceptance of raw cotton:

1. Raw cotton is accepted by parties. The party considers the amount of raw cotton of one selection and industrial variety, type, collection, issued by one accompanying document.

2. Raw cotton, infected with pests and diseases (aphids, gummosis), and selection is formed in separate batches.

Acceptance of raw cotton for quality. The quality of raw cotton by variety, humidity and debris is monitored at cotton-growing stations in the presence of a cotton picker.

The variety of raw cotton is checked in appearance on the combined samples. Determination of samples for variety clarification is performed by O'zDst 615.

In the presence of raw cotton in the batch of various selection and industrial varieties, types of harvesting and when hanging the selection, raw cotton is taken in the lower variety.

In case of disagreements in the definition of a variety, the raw cotton variety is determined from the breaking load of the fiber on the newly selected combined sample. The results of the tests are distributed to the whole party.

The quality of raw cotton for moisture and debris is controlled by average daily samples. Acceptance of raw cotton from the definition of variety, moisture and contamination, as indicated above, is allowed.

In the presence of cotton in the batch of swirled lobules in the form of a tourniquet, and if more than 20% of the infection is contaminated, pro-cotton products are taken in a lower variety.

If there is green planted cotton in the batch, it should be selected from the total mass of the produce and taken separately with reference to variety IV.

Acceptance of raw cotton by quantity. Cotton raw materials are taken according to the conditioning weight, reduced to the calculated rate of contamination and the basic rate of humidity.

The conditional mass is M_k kg, calculated by the formula

$$M_k = M_p \frac{100 + W_p}{100 + W_\phi} ;$$

Where, W_p - calculated form of humidity (%)

W_ϕ - actual humidity (%).

The calculated mass M_p kg is calculated by the formula

$$M_p = M_\phi \frac{100 - 3\phi}{100 - 3p} ;$$

Where, M_ϕ is the actual mass of cotton;

3ϕ - actual weediness (%);

$3p$ - is the calculated rate of contamination (%).

In this case, according to O'zDst615-94: $W_p = 9\%$, $S_p = 2\%$

Example. The raw cotton clap delivered the 1st variety of machine-gathering in the mass of 1500 kg. The actual moisture content of raw cotton is 15%, the content is 12% - We write down the conditions:

$M\phi = 1500$ kg - the mass of raw cotton presented for acceptance;

-factual mass fraction of contaminants of raw cotton $3\phi = 12\%$,

-the calculated mass fraction of raw cotton impurities of raw cotton $3p = 2\%$

-basic norm of the mass ratio of moisture $Wp = 9\%$,

-the actual mass ratio of moisture $W\phi = 15\%$

Determine the estimated mass of raw cotton:

$$M_p = M\phi \frac{100 - 3\phi}{100 - 3p} = 1500 \frac{100 - 12}{100 - 2} = 1347 \text{ kg}$$

Conditional mass is calculated by the formula

$$M_k = M_p \frac{100 + Wp}{100 + W\phi} = 1347 \frac{100 + 9}{100 + 15} = 1277 \text{ kg}$$

2.3. Devices for determination of quality products

Quality control of raw materials and finished products at the cotton ginning plants is headed to the plant's technical control departments, which unite the technological laboratories of the plant and the cotton-growing stations.

In the laboratories of procuring points, the inspection and quality control of the cotton taken, its condition during storage and shipment to the plant, as well as during processing in the purifying-cleaning shops, is carried out.

In our country, a common standard O'zDst 615 - to verify the quality of raw cotton is adopted.

The technological laboratory evaluates the quality of cotton fiber seeds, lint and fibrous waste.

To determine the quality indicators in laboratories, the necessary laboratory instruments are installed.

Norm of mass fraction of contaminants and moisture content

Table 2.1.

Variety raw cotton	1 class		2 class		3 class	
	Mass of contaminants (%)	Moisture content (%)	Mass of contaminants (%)	Moisture content (%)	Mass of contaminants (%)	Moisture content (%)
1	3.0	9.0	10.0	12.0	16.0	14.0
2	5.0	10.0	10.0	13.0	16.0	16.0
3	8.0	11.0	12.0	15.0	18.0	18.0
4	12.0	13.0	16.0	17.0	20.0	20.0
5	-	-	-	-	22.0	22.0

2.3.1. Determination of a contamination of raw cotton

Under the weediness of raw cotton is meant the amount of mineral and organic impurities contained in it.

Mineral impurities include earth, sand and dust, and to organic impurities - particles of leaves, bracts, stems, rotten and etc.

Contaminants of cotton is determined on the LKM instrument (Figure 2.2). The selected average sample weighing 300 grams is loaded into the feed hopper (1) of the device. Press the "start" button and, as soon as the device is switched on, the feed hopper latch (2) is pulled out, so that the sample enters the ring section of the device. After that, the valve is quickly lowered. Raw cotton is cleaned in the bar section in 120 seconds. At the same time, the signal lamp "section 1" lights up on the panel. After 120 seconds. the electromagnet turns on, the "section 2" lamp lights up, the cover (6) automatically rises and the raw cotton moves to the second section, where it is cleaned for 45 seconds. After the end of the time, the "end of cycle" warning light comes on and raw cotton for 15 seconds. is fed into a box (14) for refined raw cotton. Then the appliance stops automatically.

After stopping the device from the walls of the weeding chambers, dust is carefully swept to the bottom of the trays, which are taken out of the device.

From a large contaminants they take out individual cottonwood flies and seeds that fell on the tray, which do not belong to contaminants. Then remove the box from the appliance with the purified raw cotton, and see if there are any residual debris in it. If they are available, they are extracted from raw cotton and attached to rubbish. Collected from the trays, large and fine rubbish, together with partially isolated snail, rotten lobules, are weighed to the nearest 0.01 g.

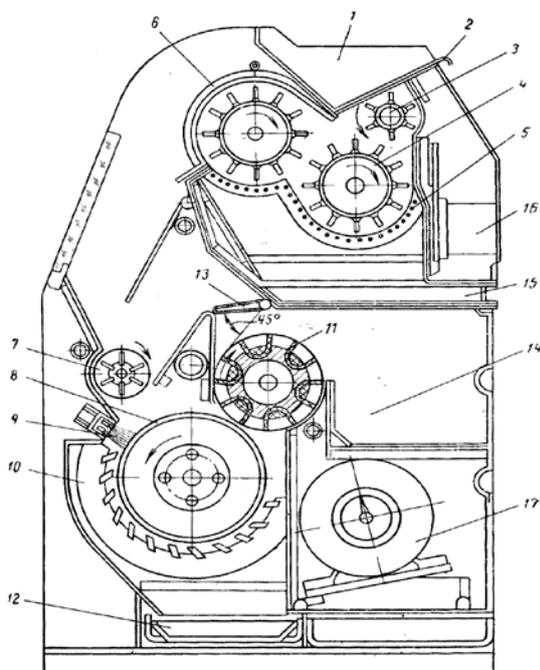


Fig.2.2. Scheme of the LKM device

1-feed hopper; 2-gate valve; 3-feeding pin drum; 4-steak drums; 5-pond grate; 7-feeder blade; 8-serrated drum; 9-fixed brush; 10-grate; 11-removable blade drum; 12-tray for large impurities; 13-valve; 14-box for peeled raw cotton; 15-tray for fine impurities; 16-time relay; 17-electric motor.

The contamination of raw cotton is calculated by the weight of the cheerful large and small contaminants to the mass of the average sample of raw cotton according to the formula (%).

$$Z = \frac{G_c}{G_n} \cdot 100$$

Where, G_c - is the mass of the selected contaminants, g;
 G_n - mass of medium sample before cleaning, g.

2.3.2. Determination of the moisture content of raw cotton

The moisture content of raw cotton is understood as the amount of moisture contained in it, which can be removed by drying. Humidity is determined with the help of the thermal meter of USH-1 (Fig 2.3). Termovagolamer type USH-1 in a set with bucks is designed for high-speed determination of moisture of raw cotton, fiber and seeds. The moisture in the USH-1 is evaporated by contact drying with rapid warm-up and drying of a thin layer of the sample in a closed chamber between the heated surfaces.

The moisture content of the raw cotton material is determined by the formula:

$$W = \frac{G_0 - G_c}{G_c} 100 - 0.6;$$

where 0.6 is the correction for the device.

The moisture content of cotton fiber is determined by the formula:

$$W = \frac{G_0 - G_c}{G_c} 100 - 0.4;$$

where 0.4 is the correction for the device.

The moisture content of cotton seeds is determined by the formula:

$$W = \frac{G_0 - G_c}{G_c} 100 - 0.5;$$

where 0.5 is the correction for the device.

G_0 - mass of the sample (initial) at the time of selection, g;

G_c - is the invariable (dry) mass of the sample, g.

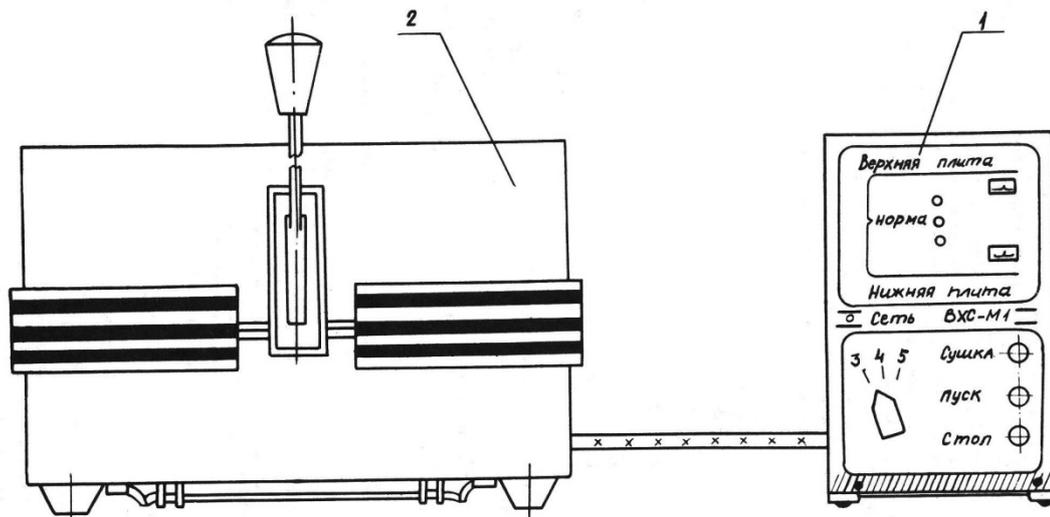


Fig.2.3. Equipment VXS-M1



Fig.2.3. Equipment "SIFAT"

2.3.3. Determination of cotton varieties

The raw cotton variety is determined by the receiver (classifier) by external characteristics, comparing the average sample of raw cotton with the standards in the systematic instrumental control of the procurement department laboratory.

In cases of difficulty in determining the variety of raw cotton by external characteristics, the variety is determined by the tool method.

To determine the variety of raw cotton, the LPS-4 device (Figure 2.4) is used, based on the fact that the air permeability index characterizes the tonnage, maturity and breaking load of the fiber.

For work on the LPS-4 device, the average sample is selected from the average or average daily sample in the following order. A sample of raw cotton is placed on a table, carefully mixed and laid out in an even layer in the form of a rectangle, which is divided into four approximately equal parts. Two opposite parts are diagonally discarded, and the remaining raw cotton is again laid out in the form of a rectangle, which is again divided into four parts, as indicated above. So the division is repeated until the sample remains 200 - 300 g. The sampled raw cotton sample, if its moisture content exceeds 12%, is dried on a laboratory CHL-3 drier and cleaned of impurities on the LKM instrument.

A weighted fiber sample (7.9 - 8.1 g) is placed in the working chamber (1) in a loose state and closed tightly with a lid (2). The fan (3) and the throttle handle (4) are turned on. A predetermined amount of air (1.8 dm³ / s) is applied to the device (5), corresponding to the set pressure drop on the manometer (6). When the manometer shows 100 mm. water column. The manometer (7) reads the scale divisions in millimeters of water column, indicating the amount of dilution of air in the instrument for a given sample.

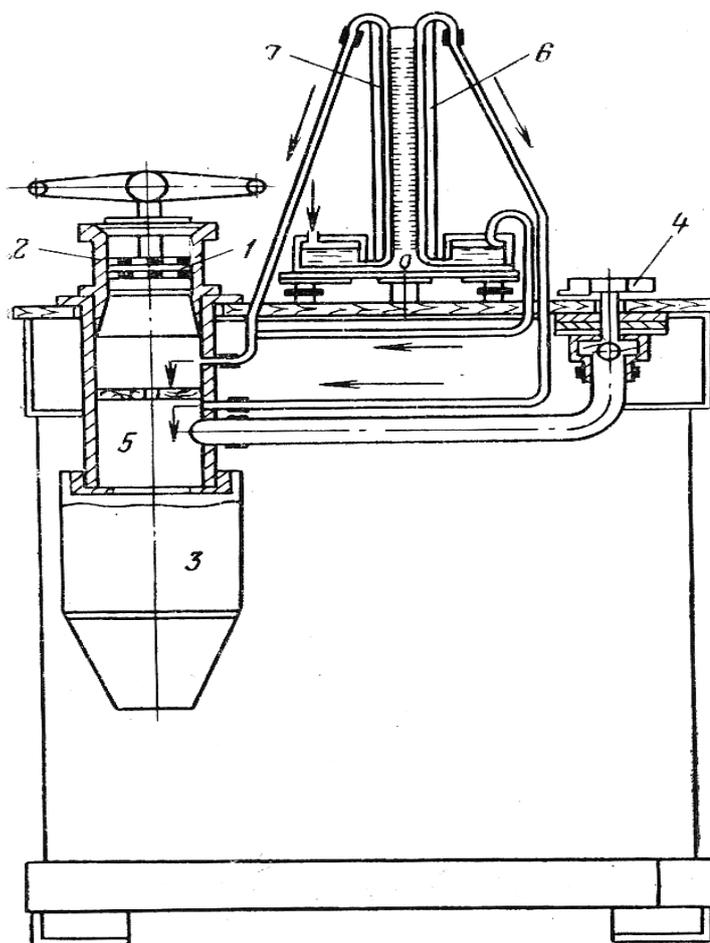


Fig.2.4. Scheme of the device LPS-4

1-working chamber; 2-cap; 3-fan; 4-throttle lever; 5-airway; 6,7-manometers

And so measure the remaining 3 samples. The average reading of the instrument is calculated from the measurement data of four samples.

2.4. Storage of raw cotton

Raw cotton, brought to the conditioning and moisture content in the drying and cleaning shop, as well as hand-picked cotton, taken with normative moisture and contamination, is stockpiled at procurement stations in warehouses or riots (Fig.2.5, 2.6).

Cotton is transported from drying aggregates and cleaning machines to warehouses or riots in cotton tipping trailers PTS-3-766M. At the present time, more progressive tractor trailers 2-PTS-4-793A have started to be produced. Loading and unloading of cotton from trailers is mechanized.

At procurement centers cotton is mainly stored in riots. The sites for riots have dimensions of 25x14 m. When constructing sites above the ground, an insulating layer is made to protect cotton from subsoil waters.



Fig. 2.5. The accumulation of raw cotton open areas



Fig. 2.6. The accumulation of raw cotton in warehouses

At present, construction of warehouses of a new construction - reinforced cement ones - has been started at the procurement centers (Fig. 2.7).

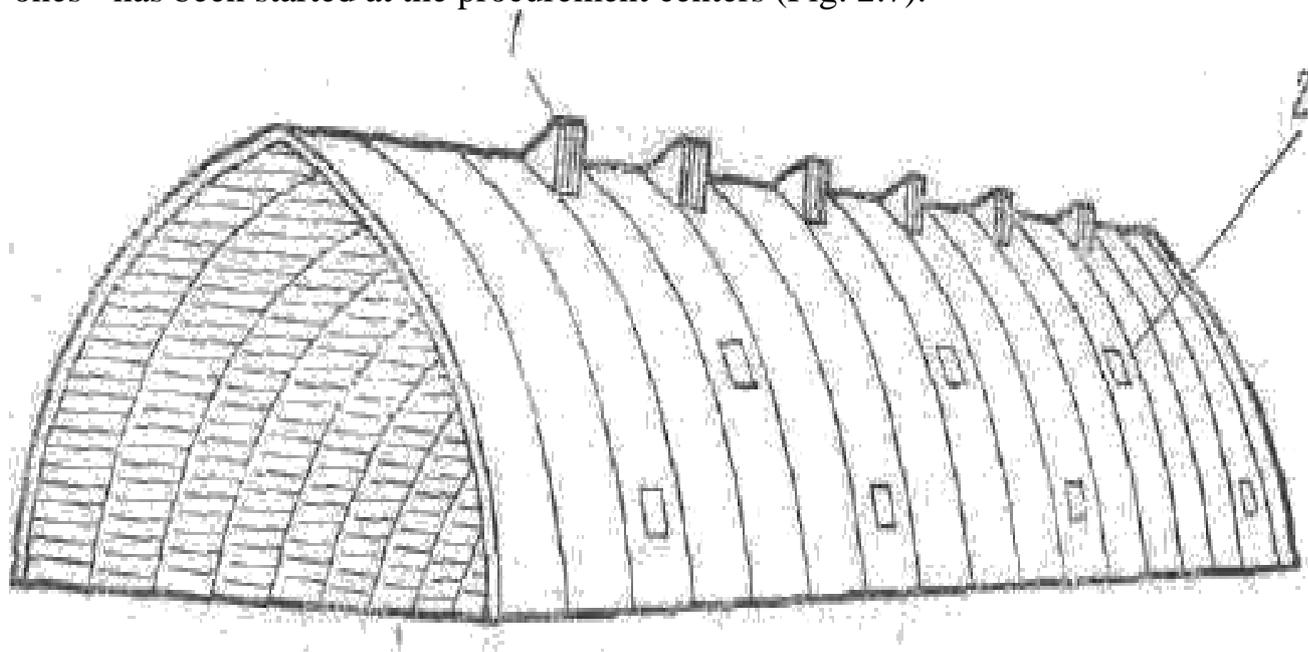


Fig.2.7. General view of the warehouse from reinforced concrete panels - shells of an arch form::

1 - loading hatches; 2 - openings for temperature measurement

2.5. Equipment for mechanization of work at harvesting stations

To mechanize labor-consuming operations for unloading raw cotton, warehouses and riot areas use a belt feeder PLA, which works in conjunction with a transverse belt conveyor TLH-18, TL. The tape feeder PLA (Figure 2.8) is designed to receive raw cotton, transported by vehicles, and then feed it to the belt conveyor. It consists of a control cabinet, a tensioner 2 of a horizontal conveyor, a suspension gear 3, an upper drum 4, a pin elevator 5, a lower drum 6, a lower reduction gear 7, a drive drum 8 and a horizontal belt conveyor 9. The feeder is mounted on a three-wheeled chassis.

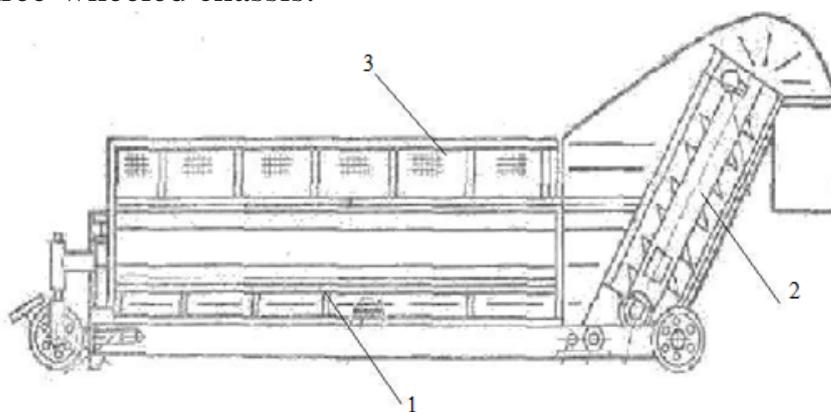


Fig.2.8. Belt Feeder Cotton PLA
1-horizontal tape; 2-elevator; 3-body

Technical characteristics of the belt feeder PLA

Productivity, t / h up	to 30
The conveyor belt speed, m / s	0,047
conveyor-elevator movement, m / s	2.22
Power of electric motors, kW	3
Overall dimensions (length, width, height),mm	8310x2100x3000

Raw cotton, unloaded from the trailer to the belt conveyor, is advanced to the feeder elevator auger, seized by its pins, raised and discharged into the receiving hopper of the belt conveyor TLH-18. Belt conveyor TLH-18 (Fig.2.9) serves to feed raw cotton into riots or warehouses. It consists of a frame 7, a trolley 2, a lifting mechanism 3, a driving and tensioning reels 4 and 8, a reducer 5. On the frame of the transporter there are side walls made of sheet steel. The conveyor belt 6 moves the cotton to the take-up funnel 7 over the deck from the longitudinal strips replacing the support rollers. The height of feed of raw cotton is regulated by the lifting mechanism of the boom.

Technical characteristics of the transporter TLH-18

Productivity at a maximum height of lifting boom, t / h	20-24
Speed of belt movement, m / s	2,9
Power of electric motors, kW	9,7
Unloading height from ground level, mm	
maximum	12125
the minimum	5000
Overall dimensions (length, width, height), mm	18500x3220x5000
Weight, kg	2965

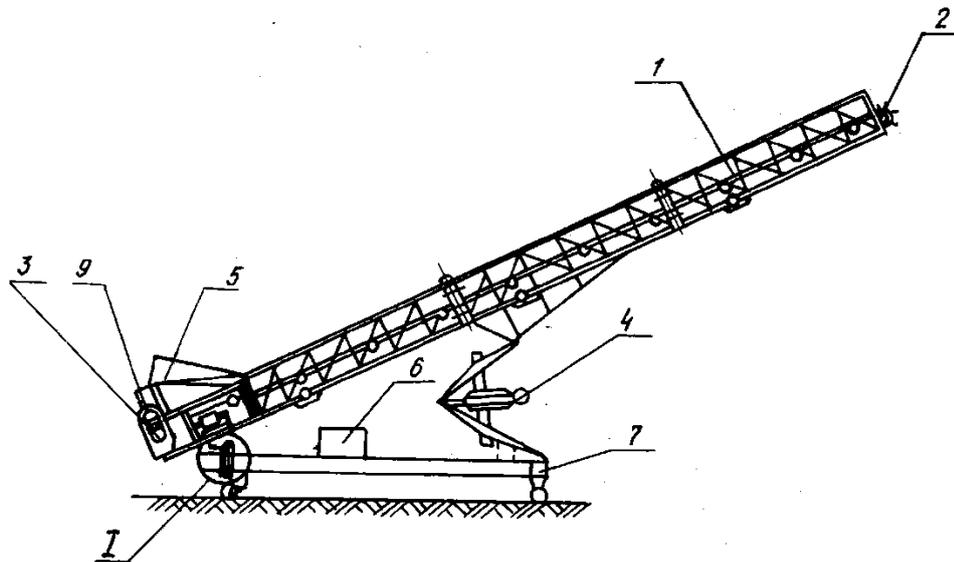


Fig. 2.9. Conveyors brand TLH-18

1-feed; 2-bypass drum; 3-drive drum; 4-lift; 5-funnel; 6-control cabinet; 7-trolley

To mechanize the processes of disassembling cotton bunts and loading raw cotton into vehicles for shipment to the cotton plant, the RBD bunker-collector is used. This is a self-propelled machine that works as follows. To dismantle the bunt, the buntorazborschik approaches him with a raised arrow and begins to disassemble it from above with horizontal layers. Loadable trailer is installed under the unloading conveyor. The dismantling of the riot begins at the ends, followed by the movement of the parser along the vacant surface of the site.

Technical characteristics of the RBD bunker collector

Productivity, t / h	
average	12
maximal	18
Power of electric motors, kW	18,8
Overall dimensions (length, width, height), mm	9650x8500x 3700
Weight, kg	6 200

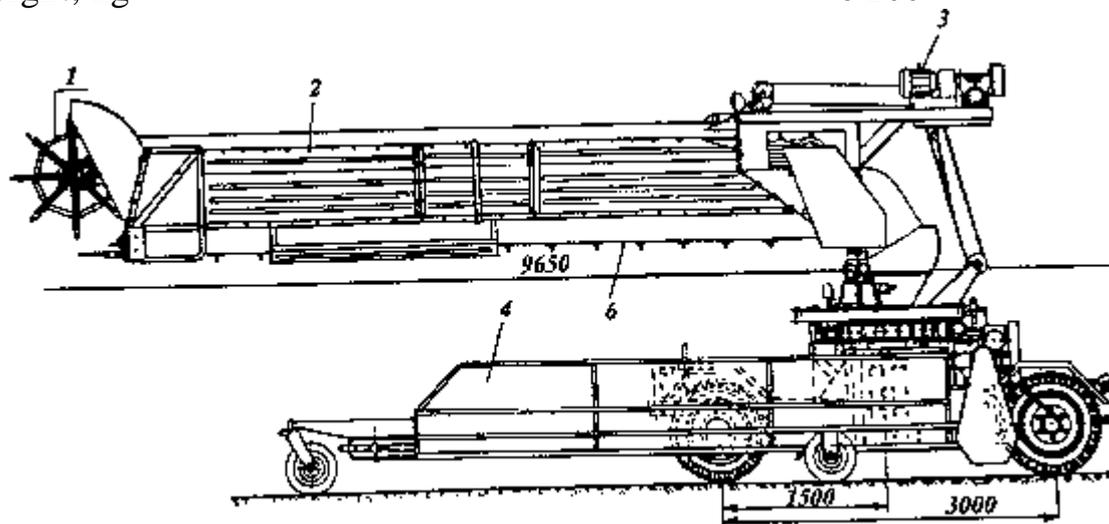


Fig. 2.10. Scheme of the bunker collector RBD

1-milling cutter; 2-arrow; 3-boom lifting mechanism; 4-horizontal conveyor;
5-pneumatic tube; 6-conveyor.

Due to its design, the buntorazborschik can be used to feed raw cotton in the pipeline of pneumatic transport of the cotton ginning plant. In this case, a distributor-feeder RP is used, which is created on the basis of the RDB assorter (Figure 2.10).

For the convenience of servicing accumulated of raw cotton, transporting tarpaulins on them, clearing the accumulated of raw cotton from snow, and performing other household tasks connected with lifting people up to 14 m high, a sliding ladder of LV is used.



Fig. 2.10. Equipment for disassembly of raw cotton RP

One of the main measures for the safety of cotton-cheese is its forced cooling by sucking moist air out of a riot or a covered storage. For this, installations with a centrifugal fan are used, which sucks the air saturated with moisture through the air ducts (tunnels) located at the base of the rump or barn floor.

The tunnels are broken by a height of 1200 and a width of 700 mm. Depending on the type of raw cotton in the riots break one longitudinal tunnel and 2-4 transverse in 12-15 days after the completion of the riot. In order to facilitate working conditions for digging tunnels, a machine is used to dig tunnels and comb out the riots of the OBT.

The OBT machine consists of a self-propelled cart, an arrows hinged on it, a pick-up conveyor. The machine is capable of digging tunnels, stripping riots, disassembling riots and loading cotton into vehicles.

Technical characteristics of the OBT machine

Productivity at digging of tunnels, t / h	3-4
stripping riots, m ² / h	120
disassembly of riots, t / h	12-15
Power of electric motors, kW	13,9
Overall dimensions, mm	
length (maximum)	15100
width	3750
height (minimum) Weight, kg	10000
Weight, kg	4740

The temperature of the raw cotton stored in the riots and storages is controlled with the help of special thermosensors, scored at a depth of 3 m. The simplest probe consists of a steel rod with a pointed tip-case for the thermometer on the body. Also, the device CT-1 of a more modern design is used to control the temperature in the riots. The rods of this device are easily embedded in raw cotton, giving a signal to the devices located on the trolley, which show the temperature of the raw cotton (Fig. 2.11).

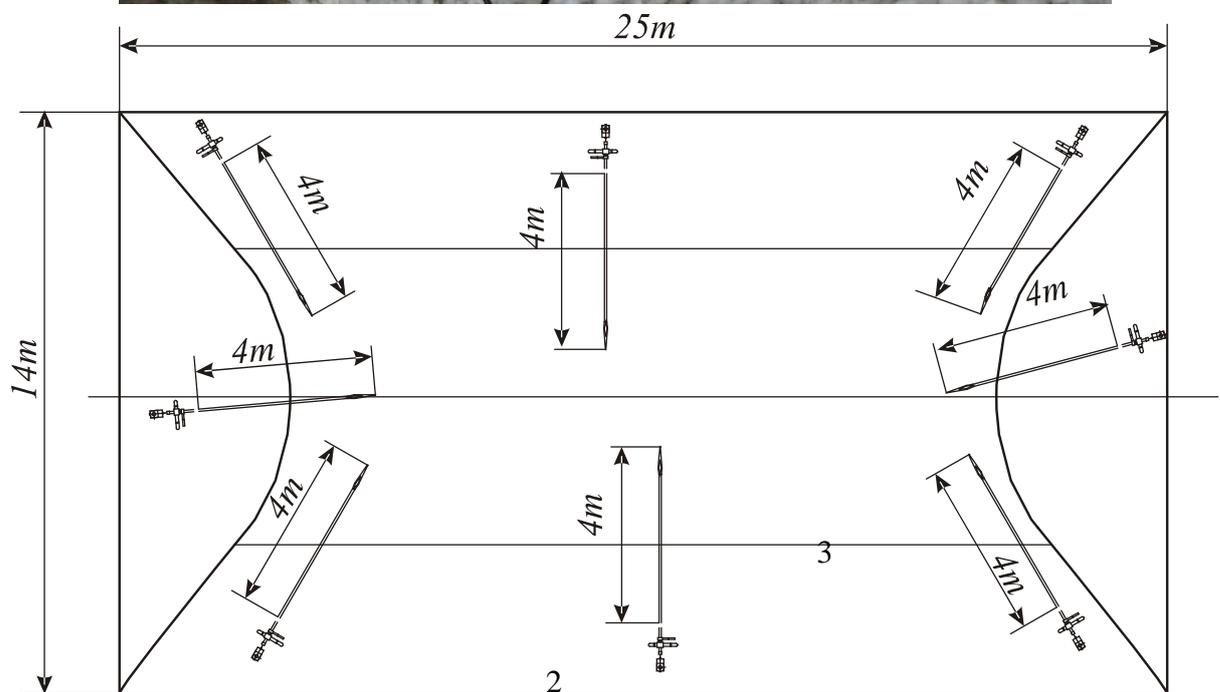


Fig.2.8. Determination of the temperature of raw cotton
 1-raw cotton riot; 2-thermostats; 3- trolley for thermocouples;
 4-electro-wardrobe; 5-device for temperature reading

The temperature of raw cotton in the period from September to October to $+30^{\circ}\text{C}$, and in all other months more than $+20^{\circ}\text{C}$ indicates self-warming of cotton. In these cases, an air-sucking plant is switched on, the operating time of which depends on the rate of temperature decrease of the raw cotton below the specified limits.

Currently, special riot areas with channels are connected to which an air-sucking plant is connected.

Initial data for the calculation of the cotton seed.
(individual assignment)

Table 2.2.

No. var.	class/ variety raw cotton	Weight raw cotton Mφ, kg	Actual humidity W φ,%	Actual contaminants Зφ,%
1	1/1	3100	8	4.1
2	1/2	2500	9	5.9
3	1/3	4500	10	7.5
4	1/4	5200	10.5	11.5
5	1/1	6300	10	4.2
6	2/1	4600	9.6	10.8
7	2/3	7300	12	11.7
8	2/4	8200	15.3	16
9	3/1	3000	12.8	16.5
10	3/2	5300	15	16
11	3/4	2800	18	19.2
12	2/1	12300	13	14
13	2/3	9200	12	12
14	1/2	6300	12	12
15	1/3	520	12	15
16	1/4	380	13	12
17	2/4	7100	17	16
18	3/2	5600	16	16
19	1/4	3700	13	12
20	2/2	8300	13	10

Control questions:

1. What are the main requirements for the acceptance of raw cotton?
2. Types of contaminants.
3. Device for determining the contamination of raw cotton and its description, the methodology for measuring.
4. Device for determining the moisture content of raw cotton and its description, the measurement procedure.
5. Device for determining the variety of raw cotton and its description, the methodology for measuring.
6. What are the main functions of cotton procurement centers?
7. What are the existing standards for the acceptance of raw cotton?
8. How is humidity and clogging of raw cotton determined?
9. How is the raw cotton variety determined when it is accepted?
10. Give an example of calculating the conditional mass of raw cotton in the process of harvesting.

Chapter III.

COTTON PROCESSING AT COTTON PROCESSING PLANTS

3.1. Cotton processing plants

Ginning factories produce primary ne refin ing raw cotton harvested in the harvesting areas. The processing of a new harvest of raw cotton begins immediately after it has been delivered to the cotton pick-up points.

From an out-of-production procurement station, cotton is exported to factories and stored on sites and warehouses (Fig. 3.1).

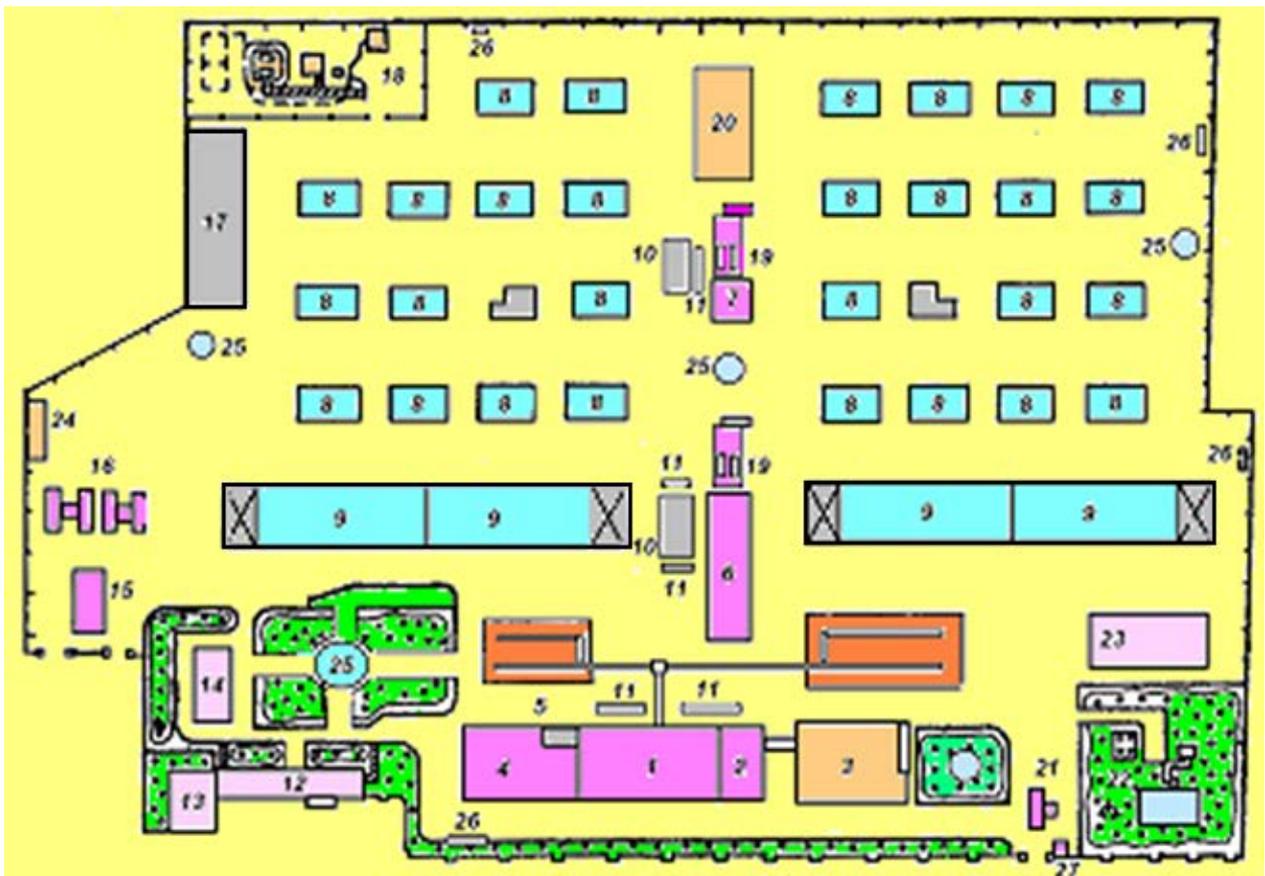


Fig. 3.1. General plan of the cotton processing plant

1. The gin-linter shop; 2. Press shop; 3. Platform for finished products (for bales); 4. Repair - mechanical workshop; 5. Transformer substation; 6. Cleaning shop; 7. Drying and cleaning shop; 8. Rebellious sites; 9. Closed warehouses for raw cotton; 10. Dust collecting chamber; 11. Cyclones; 12. Building of the plant management; 13. Dining room; 14. Technological laboratory; 15. Laboratory of the pre-plant training item; 16. Two-way autos; 17. Platform for small-scale mechanization; 18. Slope of petroleum products; 19. Drying Drums; 20. Warehouse for wet cotton; 21. One-way vehicles; 22. Water supply facilities; 23. Commodity warehouse; 24. Fire station; 25. Waterhouse; 26. Toilets; 27. Checkpoint.

Export of cotton is made in accordance with the plan for 5-6 months.

The territory of cotton ginning plants is divided into four zones:

The first zone is raw materials, warehouses and sites are located in it, the drying-cleaning shop procuring points, automobile scales for weighing incoming cotton.

The second zone is industrial, the main building of the plant is located here, a cleaning department with a furnace compartment, stores of timber products (fiber, seeds), a dressing shop for the preparation of cotton seed, mechanical workshops, material warehouses, transformer substations.

In the third zone - a zone of finished products, a platform for fiber, a platform for seeds

In the fourth zone - administrative, there are: the office, the technological laboratory of the plant, the fire station, the water economy, the canteen and other auxiliary facilities.

All the structures of the cotton ginning plant are arranged in the order of technological flow.

3.2. The main shops of the cotton processing plant

The technological process of the primary processing of cotton - the transformation of raw cotton into finished products, includes the following steps: drying and cleaning of raw cotton from small and large contaminants in the refining plant of the cotton ginning plant; ginning and fiber cleaning; linting of cotton seeds in the genie-linter shop; cleaning of linters and seeds; Packing of fiber and lint in bales in the processor shop; processing of fibrous waste and their packaging. As a rule, the genie-linter and press shops are located in the same building, the main building of the cotton gin plant (Fig. 3.2).

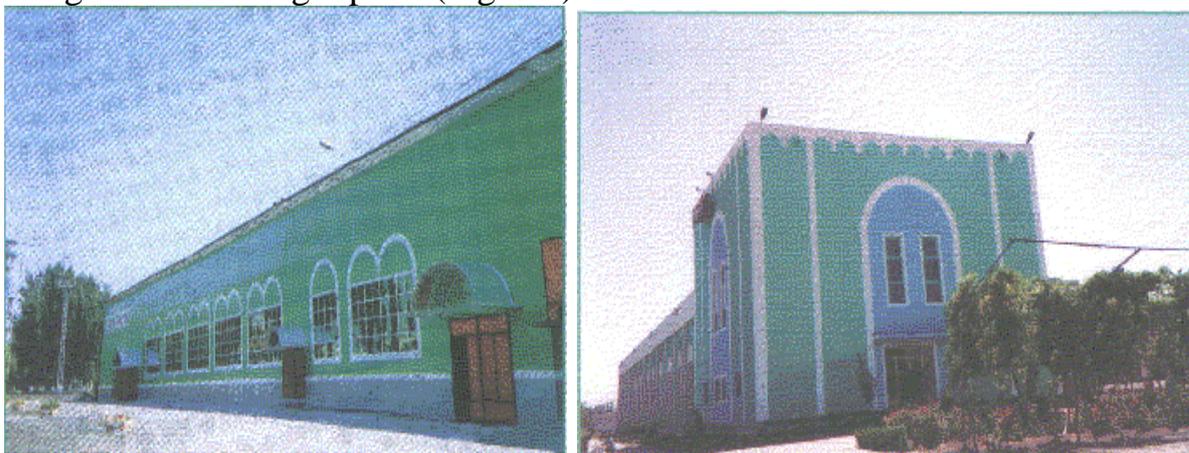


Fig.3.2. Workshops of the cotton gin plant

The production departments of the plant are equipped with special technical equipment (purifiers for raw cotton, gins, linters, fiber, lint and cotton seed cleaners, hydraulic presses, separators, condensers, etc.), means of internal shop and interdepartmental transport (pneumatic conveying systems, screw and belt conveyors, elektrovators, etc.), as well as cleaning and dedusting plants, safety

equipment and fire fighting equipment. The plant has its own repair and mechanical shop for equipment repair and warehousing.

Depending on the principle of ginning, the cotton ginning plants are divided into factories for sawing and pouring ginning.

In the sawmilling factories equipped with sawmills, they process cotton of medium-fiber selective varieties, and in the cotton gin plants equipped with valine jinas, cotton of long-fiber selenium varieties.

The cotton ginning sawing plants are divided into single-battery (2-5 gins in a complete battery) and two battery (4-5 gins in each battery), and the plant jination plants are equipped with 1-5-pack batteries of 10 or 12 cash gins in each. (Fig. 3.3)

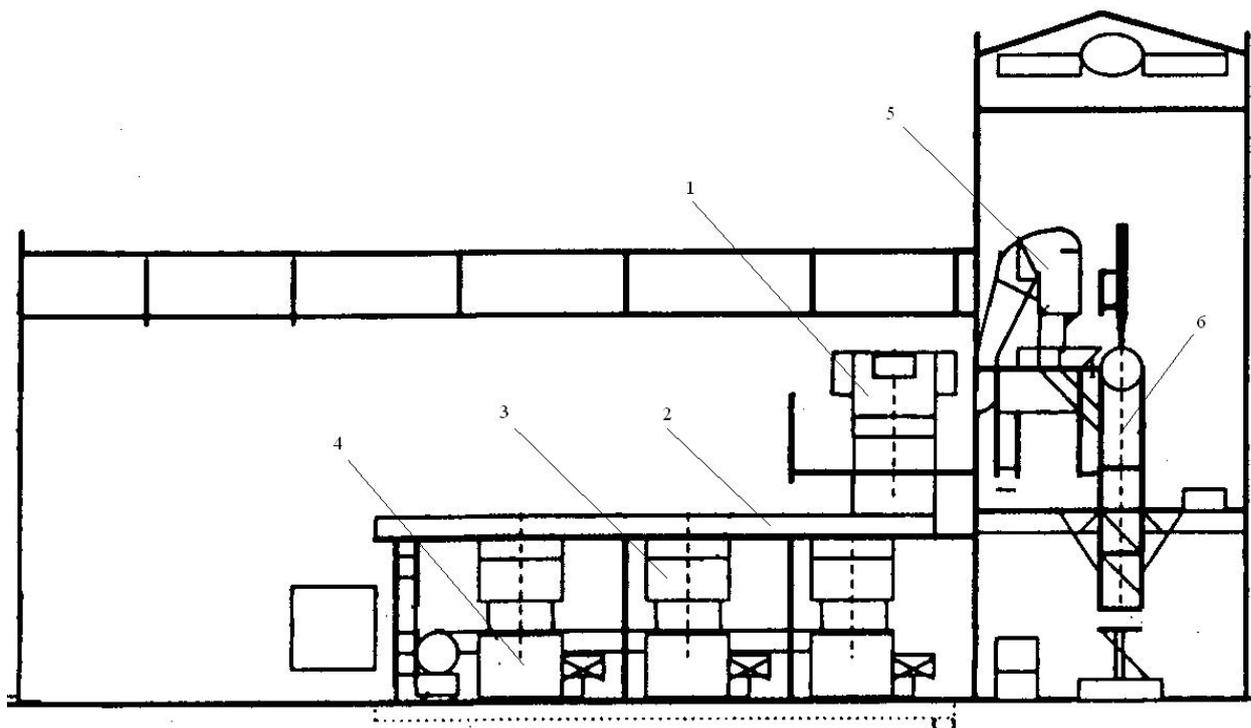


Fig. 3.3. The scheme of installation of sawed gins

1-separator; 2-spreading auger; 3-feeders of gin; 4-sawed gins; 5-condenser fiber;
6-hydropress

The main characteristic of ginning plants is their production capacity - the maximum volume of annual processing of raw cotton and the production of fiber. The volumes of raw cotton processing and fiber production depend on the productivity of units of the main process equipment, so the production capacity is estimated by the number of batteries into which they are combined.

The performance of gins is adopted in accordance with design standards and depends on the design of the gins, their technical level.

The average capacity of the four gin saw works is 8.8 thousand tons per year for fiber and 25.9 thousand tons for raw cotton. Approximately the same capacity has a 40-gin plant valichnogo - dzhinirovaniya.

The production capacity of the cotton ginning plant is not a constant quantity and should grow systematically as more and more use of new machinery and technology, improving the use of equipment, introducing rational forms of work organization and production with an appropriate increase in the production of raw cotton.

3.3. General information about the technological process

When implementing the technological process of primary processing of raw cotton, preservation of the natural properties of fiber and seeds should be ensured and their release in accordance with standards and without losses. The technological process envisages the use of a set of machines installed according to certain schemes and their operation according to the established regime, depending on the state of the raw cotton and the products being produced. Proceeding from this, the primary processing of cotton at cotton ginning plants is carried out according to the regulated scheme of the technological process, developed on the basis of the experience of advanced enterprises and the results of scientific research aimed at improving and developing the technology and technology of production. The regulated technological process of primary cotton processing is designed to ensure the correct organization of production, from acceptance to production, in accordance with the requirements of the state standard (Fig.3.4).

In accordance with the best practices of enterprises, achievements in the field of science and technology, changes in standards in the regulated technological process will be constantly adjusted.

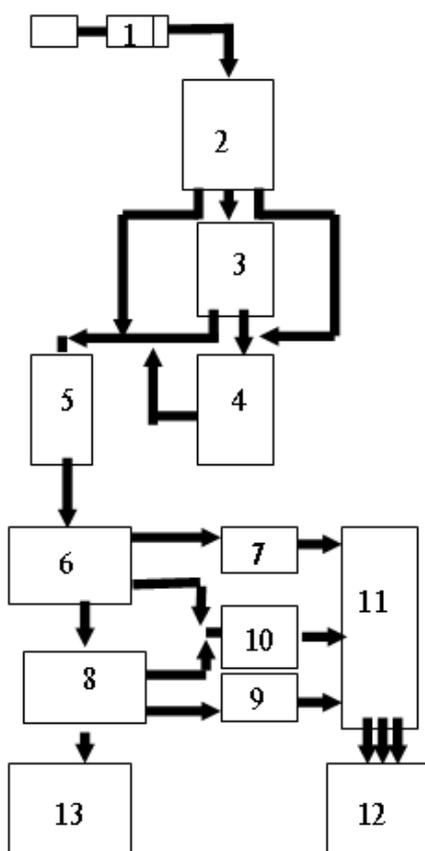


Fig. 3.4. Scheme of technological process of cotton ginning plant

1-Motor transport for transportation of raw cotton; 2-Point of acceptance of raw cotton; 3-Drying-cleaning shop; 4-Zone storage of raw cotton; 5- Cleaning shop; 6. Gining; 7-Fiber cleaning; 8-Linting; 9- Lint cleaning; 10- Cleaning of fibrous waste; 11-Pressing of fibrous materials; 12-Warehouse for finished products; 13- Warehouse for seeds.

The technological process of the cotton ginning plant provides such a sequence.

Cotton raw from warehouses and sites are transported to the cleaning shop. Transportation is mainly carried out by air passing through pneumatic pipelines. A number of factories are introducing more progressive mechanical and wheeled vehicles. The supply of cotton in pipelines and other types of transport is performed by a razber of the rioting RB-A or RP.

After drying and cleaning the raw cotton in the purification plant, it enters the main building of the plant. There, the fiber separates from the seeds, the fiber is cleaned, then from the fiber wipers the fiber enters the press shop through the pipeline, where it is pressed into bales.

Seeds of cotton in the linter shop are cleaned of contaminants, and then on the linter machines a short fiber (lint) is separated from the seeds.

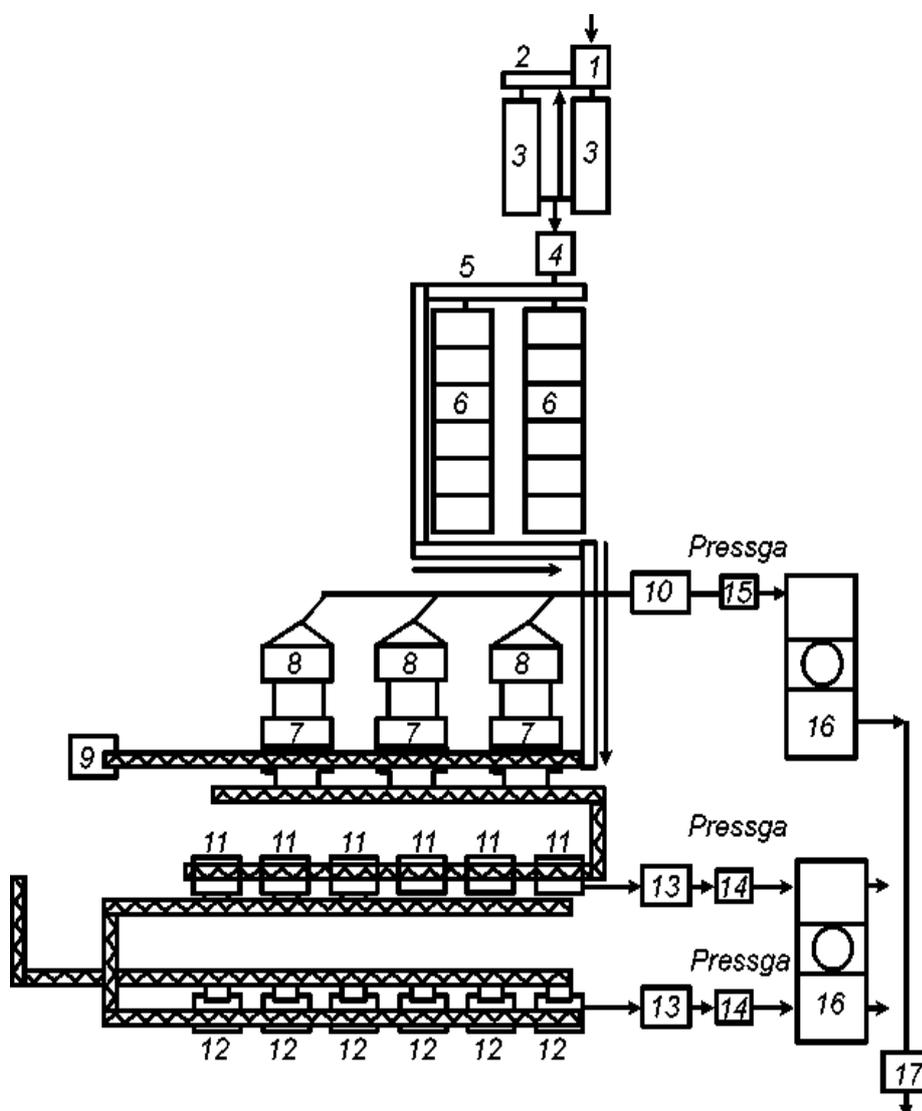


Fig. 3.5. Scheme of the technological process of a modern cotton ginning plant
 1-Separator of raw cotton SS-15A; 2-Distribution screw; 3-Drum Drum 2SB-10;
 4-Inclined belt conveyor; 5- Distribution screw; 6-Cleaner cotton raw UHK;
 7-Piloted Genies 5DP-130; 8-Fiber Wipers 1VP; 9-Bunker surplus cotton raw;
 10- Fiber condenser 5KV; 11- Linter machines of the first seme; 12- Linter machines
 of the second sema; 13- Capillary of the lint of CL; 14-Linear cleaners OVMA;
 15-Humidifier of fiber UVSH; 16-Hydraulic press unit DB-8238; 17-Libra.

In plants that produce double seedlings, the seeds after the first linting are sent to the second battens of the linters, where the linters are repeated, that is, a shorter lint is taken. A number of factories use triple linting. There, after the second linting, the seeds enter the third battery of the linters, where separation from the seeds of even shorter linters occurs. The lint from each battery of the linters comes separately through the pipelines in the press room, where it is pressed into bales.

There are two presses in the press shop for pressing fiber and lint, with fiber packed on one press, and lint separately on the second press. In the lower floor of the press shop, there are hydraulic pumps with which the presses operate.

Fiber bundles are packed with eight belt belts or twelve wire belts. The workers are pressing bales in presses.

Bunches of fiber and lint are weighed and labeled in a press shop, and then sent to a warehouse by means of a belt conveyor - loading platforms, on which they are stored separately.

At most cotton ginning plants, loading tracks are suitable for loading platforms, and loading of bales into wagons is made. In plants that do not have access roads, they are loaded onto vehicles that deliver them to warehouses located on the substation driveways.

In the main building there is usually a shop for processing waste products (short fiber, fluff), where they are cleaned and pressed.

When processing raw cotton seed, the technological process involves the use of a complex of equipment for presowing seed treatment. On the preplant seed treatment site, they are sorted, calibrated to size, disinfected with special protectants, protecting seeds from agricultural pests and diseases.

The exhausted dusty air through the pipelines is directed to the cyclone dust collectors, where the main part of the dust settles, then the air, which carries a certain amount of dust, is sent to the second group of cyclones or to the dust chambers, where it is finally cleaned. Cyclones and dust chambers are located in close proximity to the main building of the plant.

Control questions

1. Name the types of ginning plants.
2. List the main shops of cotton ginning plants.
3. What is the production capacity of a ginning plant?
4. What are the stages of the technological process of primary processing?
cotton.
5. Technological process of drying raw cotton.
6. Technological process of cleaning cotton.
7. Technological process jinfication of raw cotton.
8. The technological process of cotton seed linting.

Chapter I V

TECHNOLOGICAL OPERATIONS TRANSPORTATION OF RAW COTTON

4.1. Technological operations transportation of raw cotton

The procurement of raw cotton is its storage, continuous technological process, the movement of raw materials and finished products in shops and on the territory of a cotton plant and are carried out using a large number of various vehicles, special devices and installations that mechanize labor-intensive and heavy work. (Fig. 4.1)

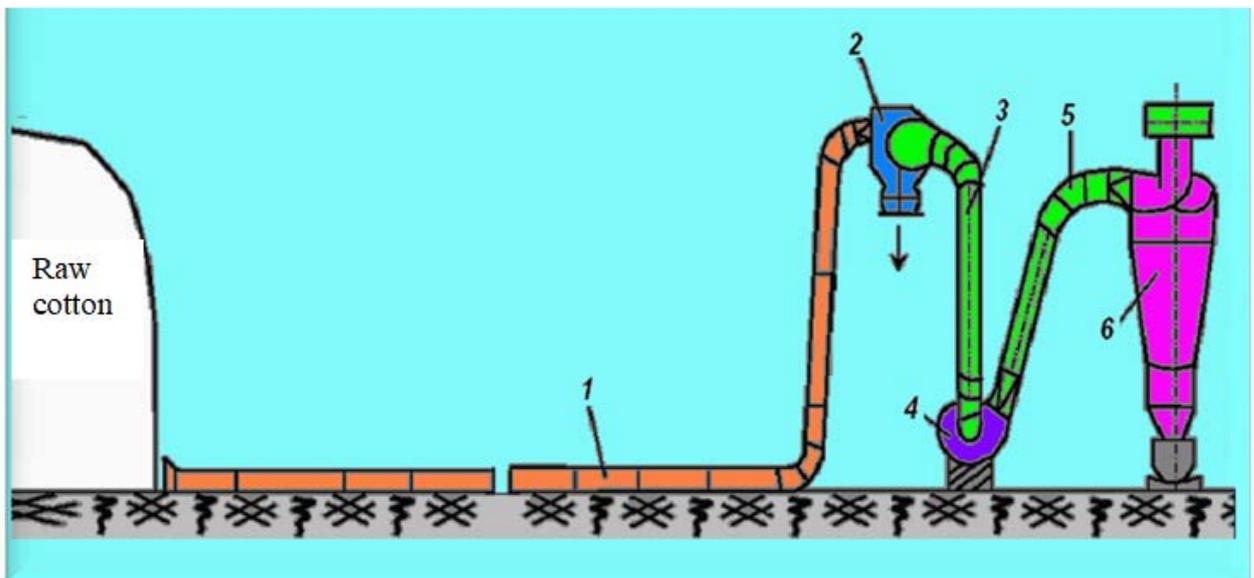


Fig. 4.1. Technological process using pneumatic transportation for raw cotton
1, 3, 5-pipeline of pneumatic transport; 2-Separator SS-15A; 4-Fan; 6-Cyclone.

Complex mechanization of all these works is difficult because of the large volumes of raw materials and finished products. Continuous technological process with powerful cargo flows (12-15 t / h of raw cotton, seeds, cotton fiber) is a characteristic feature of cotton ginning plants.

The area of the cotton plant is quite large and the distance between the shops is from 50 to 120 meters, and sometimes more. Earlier, the transportation of raw cotton through the territory of the cotton plant was carried out due to the fact that people were dragging sacks of cotton from the shop to the shop on the back. Now, in connection with the increase in the productivity of the cotton plant, this method has become unacceptable, and in the main work on the mechanization of labor-intensive operations is carried out by transport devices of various types.

There are two ways of transporting raw cotton:

1) Mechanical method. The mechanical method of transportation is realized at the expense of conveyors. They have low energy intensity, but they do not have maneuvering, and they also have a low degree of reliability and high metal intensity.

2) Pneumatic method. Pneumatic method is the main mode of transportation of raw cotton from storage facilities to production, and also from one shop to another. Pneumatic transport is realized at the expense of air. Pneumatic transport is reliable in operation, there is no loss of material during transportation, compact, easy to maintain and repair. But from the point of view of energy consumption, air is a significantly energy-intensive medium.

The transportation must meet the following criteria:

- ensure sufficient production capacity for the cotton plant (at least 12 t / h);
- have high maneuverability;
- high reliability in operation;
- low energy intensity of the process.

With the mechanical method of transportation (using belt conveyors), only the fourth point of the requirement is satisfied, so this type of transportation is advisable to use in the industrial zone of the cotton plant, for the transportation of cotton between the shops.

The pneumatic method ensures the fulfillment of the first three points, and it is expedient to install it in the raw zone of the cotton plant.

Pneumatic transport in the place of installation is divided into internal, inter-shop and intra-shop. The principle of its operation is based on the ability of air, when moving through pipelines, to move the material in a suspended state.

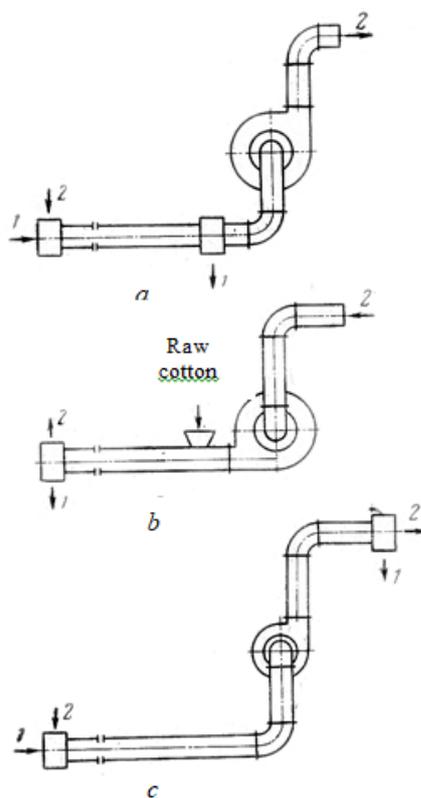


Fig.4.2. Scheme of types of pneumatic transportation

The movement of air is provided by the difference in pressure at the beginning and at the end of the pneumatic transport unit. By way of creating a pressure difference at the beginning of the pipeline (overpressure) or at the end of it

(rarefaction), the pneumatic transportation systems are distinguished: suction (a), injection (b), and suction-injection or combined (c) type (Fig.4.2)

At cotton ginning plants, suction plants are used to transport cotton fiber from a battery of saw gins, and lint from liners to capacitors, this method of transportation is the most optimal.

The suction-type pneumatic transport unit for raw cotton consists of the following main elements (Figure 4.3.):

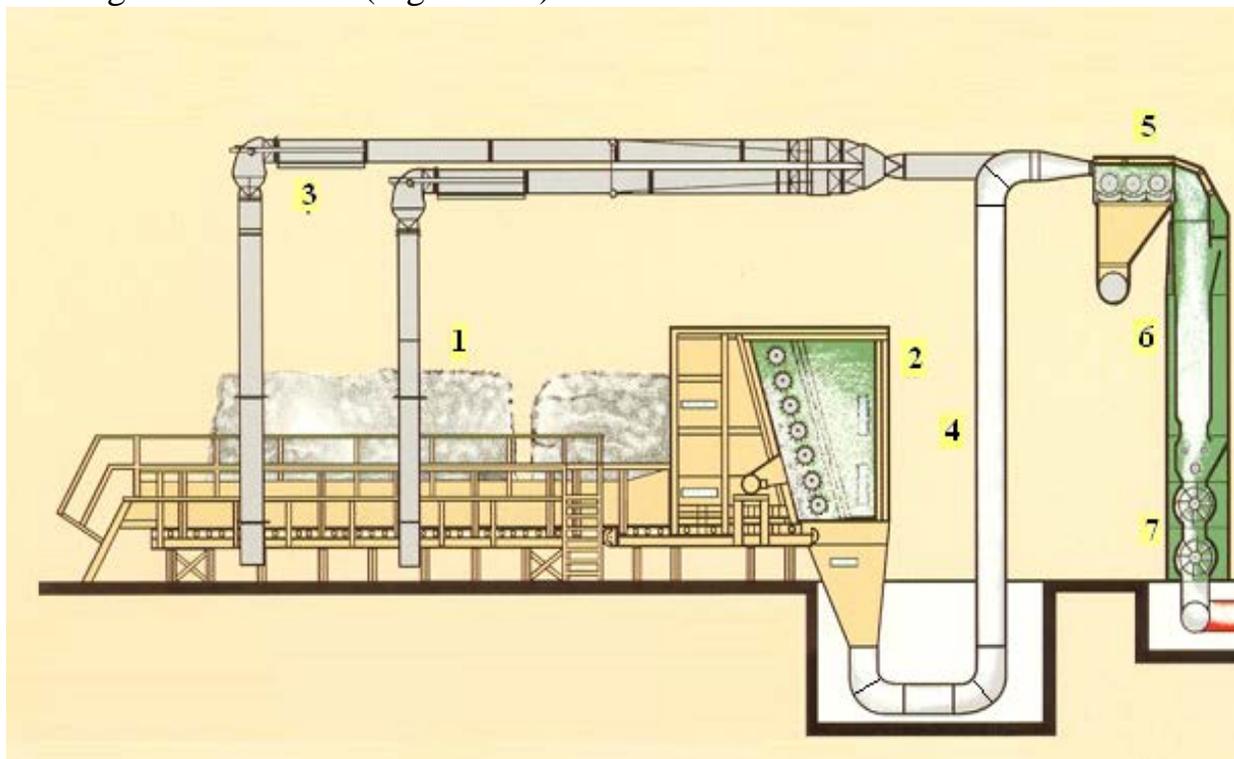


Fig.4.3. Scheme of type pneumatic transportation system of USA

- 1 - module; 2- equipment for disassembly of raw cotton; 3 - suction pipe;
4 - suction duct; 5 - separator cleaner; 6 -7 - separator.

The working pipeline consists of a main section and portable links. The main section is made of a 2-3 mm pipe, sheet steel, welded structure or asbestos cement pipes with a diameter of 400-450 mm. In large factories with large raw cotton raw stock, the working length of the pipeline, or the radius of the pneumatic movement, can reach 200-250 meters. Trunk stationary pipeline is laid in trenches underground, but at a depth of 600-700 mm or on trestles. Throughout the length of the pipeline, at certain intervals, sighting pits and switching pits are installed, where there are branching of the pipeline to separate storages, as well as tees with access to the surface. A portable pipeline, as a rule, is laid on the ground.

The device, which ensures the transfer of raw cotton through the territory of a cotton plant, is called a separator. The separator operates on the principle of the suction effect, which is formed by the creation of a negative pressure separator in the working chamber. This mode of transport dominates all cotton plants.

4.2. Separators for raw cotton

The scraper separator SS-15A (Fig.4.4.) Is a chamber divided by a mesh partition into two parts: cotton 1 and air 2. In the cotton part there are a guide 3 and a scraper 4 that cleans the cotton of the raw material from the grid 5 located on the sides, and sends it to the vacuum valve 6. The vacuum valve is designed for unloading raw cotton from the separator chamber. The air part of the chamber is bounded by the mesh surface on the sides and cones of the separator. The raw cotton fed to the separator flows into the cotton chamber 1, the air flow rate drops sharply and the bulk of the raw cotton goes to the vacuum valve zone 6, and a small part reaches the net surface and is also dropped by the scraper 4 into the vacuum valve 6. Further, the entire mass of raw cotton is removed by a vacuum valve 6 from the machine.

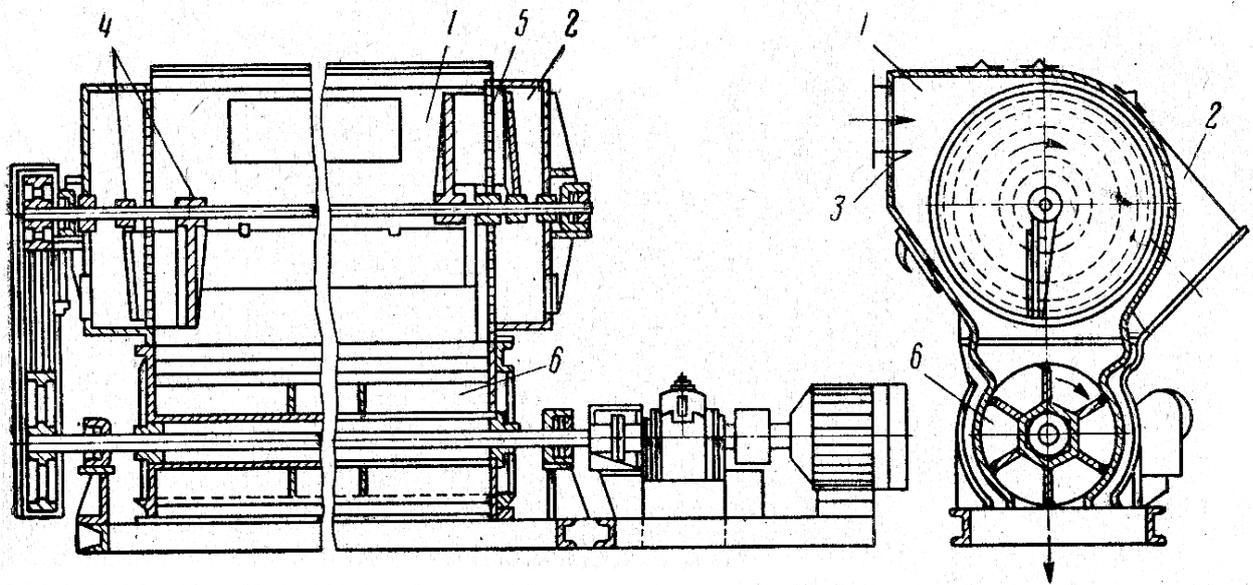


Fig. 4.4. Scheme of scraper separator brand SS-15A
1-separation chamber; 2-pipeline; 3-inlet connection; 4-scraper; 5-grid;
6-vacuum valve.

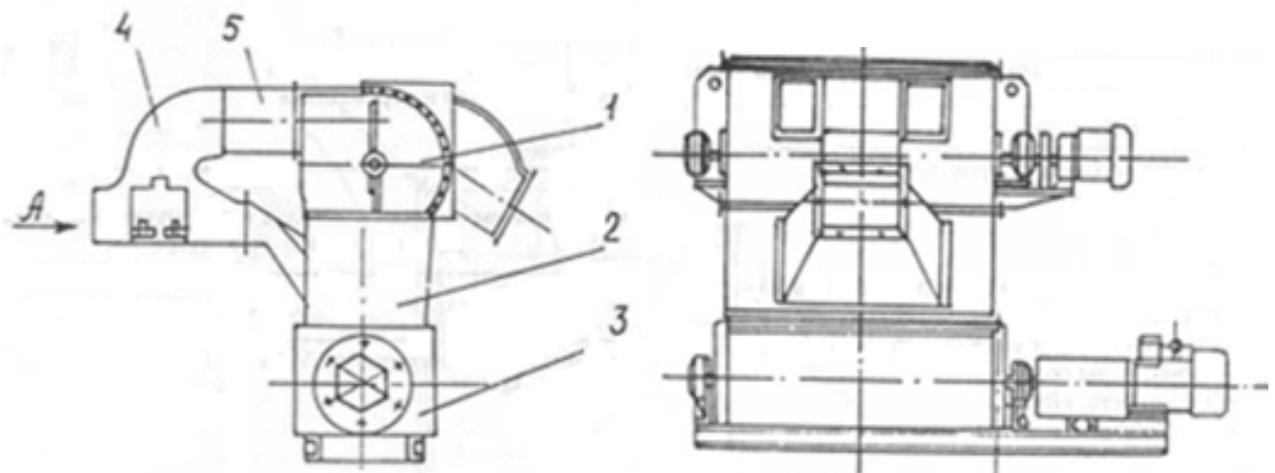


Fig.4.5. Scheme of inertial separator brand SX
1- separation chamber; 2 - separation shaft; 3 - the vacuum valve;
4 - inertial separator; 5 - adapter.

The cotton separator brand SX (Fig.4.5) was developed instead of the separator SS-15A and since 1989. began to be introduced everywhere in the cotton plants.

Air flow together with the transported raw cotton along the duct enters the inertial separator 4, where it is divided into two streams. The bottom stream containing the bulk of the raw cotton is sent to the separation shaft 2 and the upper stream to the separation chamber 1. In the chamber and the shaft, the air loses speed and the cotton falls into the vacuum valve 3, from which it enters the next processing cycle.

Technical and economic indicators of separators.

Table 4.1.

Brand of separator	Performance	Cleaning effect	Power Consumption	Radius of action
SS-15A	Up to 15 t / h	8-10%	7 kW	120-150m
SX	20-22 t / h	12-15%	9.7 kW	180-200m

The principle of operation of pneumatic transport is based on the communication of raw cotton at a certain speed (V) with a moving air stream. At the same time, under the influence of the air pressure (H), the raw cotton in the suspended state moves inside the pipeline. The necessary speed (V_B) of transporting air at the point of supply of raw cotton to the pipeline can be found by the formula:

$$V_B = 8,5G^{0,4} \text{ m / s}$$

The air flow (Q) at the suction end of the pipeline is determined by the formula:

$$Q = \frac{\pi d^2}{4} \times V_B \text{ (m}^3/\text{s)}$$

where: d - diameter of the pipeline, m;

π - 3.14;

G - capacity of the separator, t / h;

8.5 - factor that takes into account the head loss through the pipeline and friction of air against the wall of the pipeline.

Knowing the necessary pressure inside the pipeline of the transport system and depending on the capacity of the separators for raw cotton, you can determine the radius of action of the yard pneumatic transport unit:

$$R = H \times \eta \times \Psi \left[1 + \frac{\mu \left(\frac{1100}{V_B^3} \right) \times \kappa}{Q^2} \right]$$

where: - weight concentration of the mixture, $\mu = \frac{G}{5,4 \times Q}$

κ - parabola coefficient for new pipes, $\kappa = 0,111$

π - efficiency of the installation, $\eta = 0,5$

H - created air pressure by the fan, mm water column.

ψ - coefficient that takes into account the movement of raw cotton through the pipeline

(at $G = 5-10t / h, \psi = 0.6$, at $\psi G > 10t / h, \psi = 0.5$) ψ

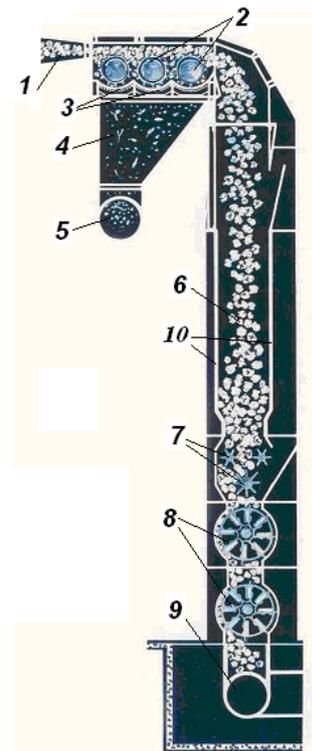
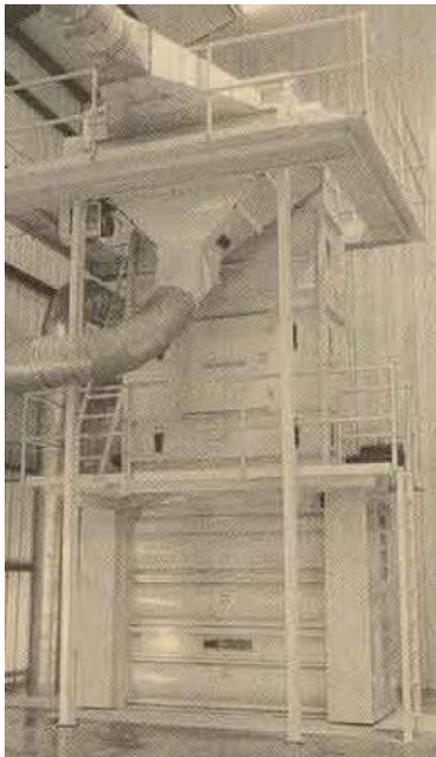


Fig. 4.6. Technological scheme of separator and appearance Big "J"

- 1-Inlet nozzle; 2-Drum Drums; 3- Mesh surface; 4-Weed chamber;
5-Loose Screw; 6-Mine; 7- Work rollers; 8- Vacuum valve; 9-Outlet nozzle;
10- Guardians.

Control questions:

1. Where the operation of transporting raw cotton through the cotton plant is applied.
2. Methods of transportation, and their differences.
3. Types of pneumatic conveying systems.
4. Differences in separators of raw cotton of variety SS-15A and SX.
5. What is called the weight concentration of the mixture.

Chapter V

DRYING OF RAW COTTON MATERIALS

5.1. Moisture of raw cotton

Cotton raw contains an absolutely dry mass and a certain amount of moisture. The moisture content of raw cotton is the ratio of the mass of moisture contained in it to the mass of absolutely dry raw cotton, expressed as a percentage.

Depending on the nature of the relationship of moisture with raw cotton and the possibility of its removal during drying, they distinguish between moisture, excess, and equilibrium. Raw cotton, containing free moisture, located in the pores, voids and capillaries, is considered wet. Excess moisture includes free moisture and that portion of hygroscopic moisture that can be removed under drying conditions. Uniform moisture content is the moisture content of raw cotton, which is established spontaneously depending on the environmental conditions.

The high moisture of raw cotton adversely affects its cleaning, storage and processing. When storing raw cotton with high humidity (more than 13-14%) in seeds, biological processes occur that can disrupt the properties of fiber and lead to spoilage of seeds.

When processing raw cotton with high humidity, the equipment performance decreases due to frequent stops resulting from fiber clogging of working parts. With increased humidity, the elasticity of the fiber decreases and its adhesion to weedy impurities increases, which leads to the formation of defects in the fiber and a reduction in the purifying effect in sora and uluk. As a result, fiber from such raw cotton is of poor quality.

To ensure high fiber quality and efficient operation of process equipment, raw cotton must be dried to a technological humidity of 7-8%.

5.2. Technological process of drying raw cotton

The drying process, i.e., the release of moisture from raw cotton into the air space by air occurs when the partial vapor pressure at the surface of the raw cotton is greater than the partial pressure of the ambient steam.

To the drying of raw cotton, certain requirements are made. Cotton should be dried with a uniform selection of moisture from fiber and seeds. Drying should be carried out with maximum economy and in a minimum period. The irregularity of raw cotton, the various thermal and moisture-carrying qualities of its components require a careful approach to the choice of the drying regime for raw cotton.

In cotton plant, raw cotton is dried in special devices - dryers. A gaseous mixture (air or flue gases) that receives heat from special sources and transfers it to the dried raw cotton is called a heat carrier. Dryers for raw cotton are in-line, when raw cotton and heat carrier move in one direction, and countercurrent, when raw cotton and heat carrier move in opposite directions.

In connection with the increase in production of raw cotton, the introduction of machine harvesting of the harvest and the reduction of its terms in place of inefficient dryers, dry-type dryers of continuous type were created.

The process of drying raw cotton in drum dryers is as follows. The heat carrier from the furnace is sucked off by a fan-extinguisher and forced through a pipeline into a dry drum. Wet raw cotton, fed into the dried drum, is gradually dried and after the return to the heat carrier, excess moisture flows through the tray from the dryer. The cooled, saturated moisture carrier flows through the exhaust pipe into the atmosphere. The supply of wet cotton raw material to the dryer and the drying out takes place continuously (Fig. 5.1).



Fig.5.1. Technological process of drying raw cotton

The quality of the drying process and the operation of the dryer are characterized by moisture extraction, moisture and moisture production of raw cotton, uniformity of drying, heat consumption per kilogram of evaporated moisture. Moisture selection shows the amount of moisture that evaporated in the dryer, relative to the mass of absolutely dry raw cotton in percent.

As a coolant for drying raw cotton, a mixture of combustion products of tractor kerosene or natural gas with atmospheric air is used. The temperature of the heat carrier is determined depending on the moisture content of the raw cotton and the design of the dryers.

When drying, it is not allowed to overheat raw cotton and its components (maximum temperature of seeds should not be above 70°C, fibers - no higher than 100°C), therefore the drying time and temperature of the coolant are appropriately selected.

Drums of cotton dryers inside are filled with lifting and lobing devices for mixing raw cotton and improving the drying process. Axial movement of cotton in drum dryers is carried out due to the inclination of the bar \rightarrow bana or the pressure of the coolant on the particles of raw cotton.

In the cotton ginning industry, drum dryers 2SB-10 (Fig. 5.2) are widely used. The raw cotton enters the feeder through the shaft, from where it is sent to the drying drum by an inclined schneck. Then, rising with longitudinal blades and falling into the lower part of the drum, the raw cotton is dried. When falling under the influence of the coolant, cotton moves along the drum axis to the output tray of the dryer. The spent coolant from the dryer through the exhaust pipe goes into the atmosphere. The drum is mounted on the front support and the rear support. Rotation of the drum is carried out by a drive consisting of a reducer and an electric motor.

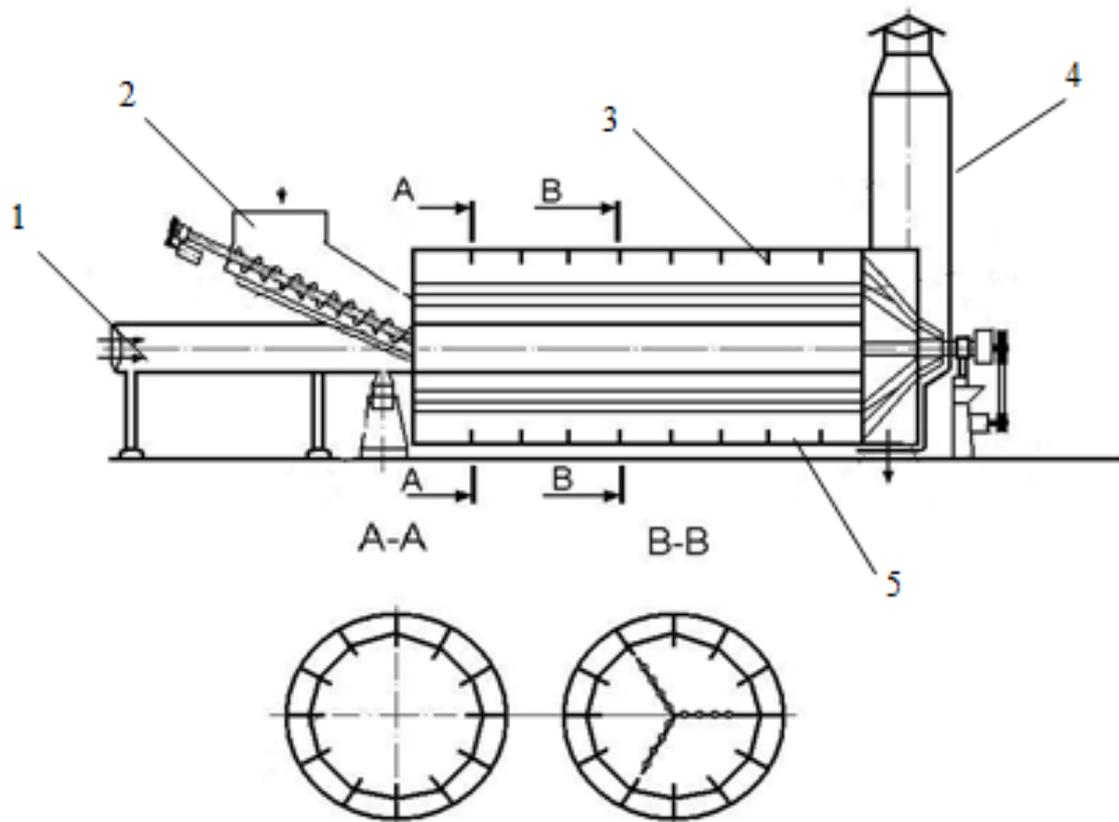


Fig. 5.2. Scheme of drum dryer 2SB-10

1-pipeline of drying agent; 2 feeder; 3-drum; 4-pipe exhaust air; 5-blades.

Technical characteristics of the drum dryer 2SB-10

Productivity for dried raw cotton, t / h up to	10
Productivity on evaporated moisture, t / h up to	0.8
Heat consumption per 1 kg of evaporated moisture, kcal	2200-2500
Coolant temperature at the inlet from the dryer,	0C to 280
Drum rotation frequency, min	10
Power of electric motors, kW	
on the drum drive	13
auger screw	4
dimensions	
(length, width, height without a pipe), mm	14730x4865x3800
Weight, kg	10 300

An improved version of the drum dryer 2SB-10 is a SBO dryer with a combined process of drying and cleaning cotton from contaminants (Fig. 5.3)

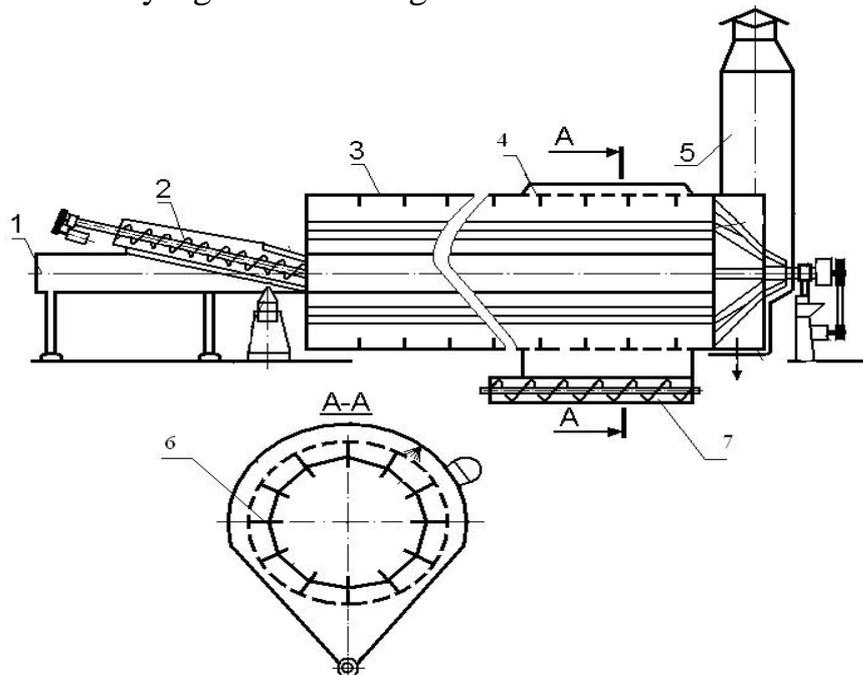


Fig. 5.3 Scheme drum dryer SBO

1-pipeline of drying agent; 2-feeder, 3-drum; 4-cleaning section;
5-pipe exhaust air; 6-blades; 7-screw for trashes.

The process of drying raw cotton in a drying drum SBO until the arrival of cotton in the zone of the cleaning section is similar to the technological process of drying in the dryer 2SB-10. In the cleaning section of the shell of the drying drum in the area of 3000 mm consists of a mesh wound on the frame of the drum and is enclosed in a casing, the lower part of which forms a hopper 2 for contaminants with a screw 3. Above the longitudinal axis of the drum, there is a pipeline 4 with a nozzle 5 that communicates with a high-pressure fan, which pumps a coolant through the nozzle at a temperature of 60-80 ° C.

At the output of raw cotton from the drum, its moisture content decreases due to the evaporation of moisture from the seeds, the moisture content of the fiber is at the level of 4-5%, which weakens the bond of contaminants with the fiber.

The device of the cleaning section determines the longitudinally cross-effect of the coolant on cotton. In the cross direction, a stream of coolant from the nozzle operates at a speed of 15 m / s. At the moment when the raw cotton falls from the blades of the cleaning section, it appears in a jet of heat carrier directed from the nozzle. Under the influence of its mass and the aerodynamic force of the jet, cotton volutes strike against the net, resulting in weeding out impurities. In the process of transportation of raw cotton in the flow of the coolant, fiber breaks down, which improves the excretion of contaminants. Then the coolant passes through the grid into the hopper for contaminants, dragging along the contaminants.

The spent coolant is removed to the exhaust pipe, while the cotton, dried and cleared from the contaminants, is unloaded from the dryer through the unloading chute. Dirt from the bunker is discharged by auger.

The cross-sectional action of the coolant on the raw cotton intensifies the drying process at the final stage. The cleaning effect of the unit reaches 45%, the rest of the technical specifications are the same as those of the 2SB-10 dryer.

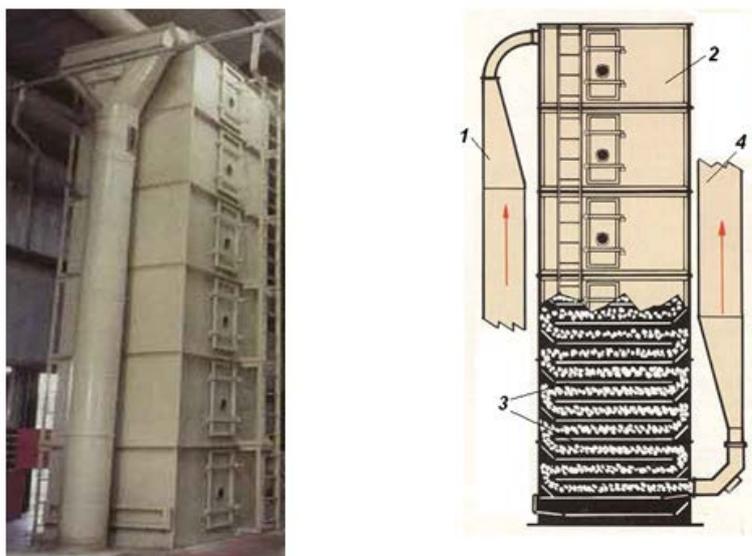


Fig.5.4. Tower cotton drying
1-Inlet nozzle; 2-Hull; 3- Shelf dryers; 4-Outlet nozzle.

5.3. Heat supply for raw cotton

To provide raw cotton driers, the required quantity of coolant uses currents in which liquid or gaseous fuels are burned. At cotton ginning plants, heating units for drying plants use combustor units operating on tractor kerosene or natural gas (Figure 5.3). The use of such fuels is conditioned by the need for minimum contamination of the dried cotton raw with fly ash carried from the furnace by flue gases, reaching a high temperature.

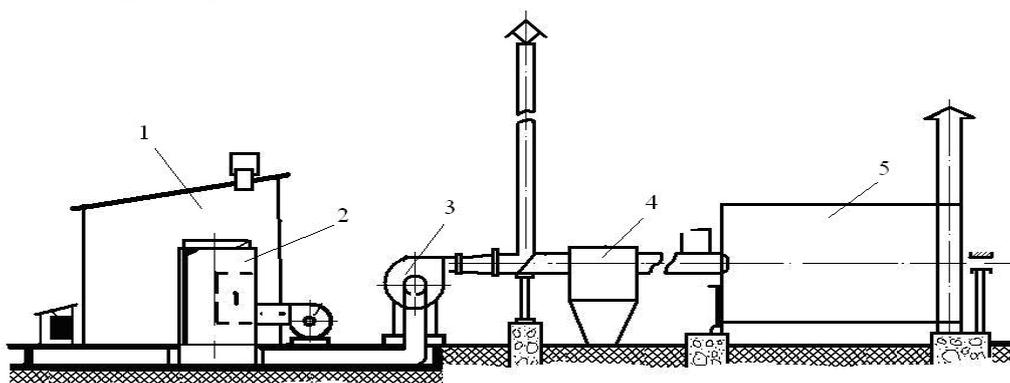


Fig. 5.5. The scheme of installation of the heat generator TJ-1,5
1-furnace department; 2-heat generator; 3-smoke generator; 4-cracks;
5-drying drum.

The fuel used for combustion is premixed with air to the required concentration, and the resulting mixture is heated to the ignition temperature. The combustible steam-air mixture is ignited with a glow plug. Further combustion of fuel is maintained by its continuous evaporation from the heat coming from the incandescent furnace. In the combustion of liquid and gaseous fuels, a torch is

formed. It has three zones: a zone of mixing fuel with air, a zone of heating and evaporation of fuel and an ignition zone. The length of the torch depends on the quality of the fuel spray and the shape of the combustion chamber. Low-pressure injectors are used to spray the liquid fuel.

For combustion of liquid fuel in cotton ginning plants, TJ-1.5 furnace installations are used (Fig. 5.5). for gaseous-installation of TG-1.5 (Figure 5.6). The flue gases mixed with atmospheric air, brought to the required temperature, are sucked from the furnace by a fan-extinguisher and pumped through the gas flue into the drying drum.

The main technical characteristics of combustion plants

Table 5.3.

Index	Heating installations	
	TJ-1.5	TG-1.5
Heating capacity, kJ / h	$7.1 \cdot 10^6$	$6.3 \cdot 10^6$
Temperature control range of coolant temperature, ° C	70-300	70-300
Quantity of produced heat-carrier, m3 / h	25000	30000
Efficiency, %	98-99	98-99
Fuel consumption (maximum)		
tractor kerosene, kg / h	140	-
natural gas, m3 / h	-	180

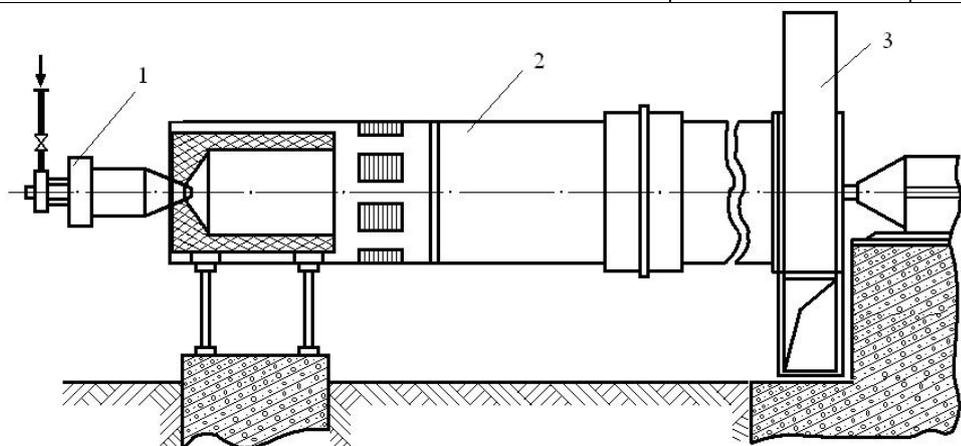


Fig. 5.6. Scheme of heat generator TG-1,5
1-injection mixer; 2- mixing chamber; 3- smoke pump.

Gaseous fuels burn more fully in the furnace, as a result of which it is possible to obtain a higher temperature. The cost of a unit of heat from the combustion of gaseous fuel is much lower than when burning liquid (Table 5.3).

Control questions:

1. How to determine the moisture content of raw cotton.
2. Construction and operation of the dryer 2SB-10.
3. The design and operation of the dryer brand 2SBO.
4. Heating of drying drums.
5. Heat generators TJ-1.5 and TG-1,5.

Chapter VI

THE CLEANING PROCESS OF RAW COTTON

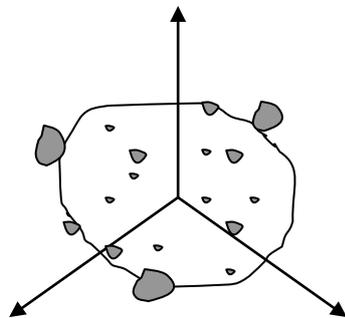
6.1. Technological operation of cleaning raw cotton from mineral and small contaminants

Raw cotton is cleaned from contaminants in the purification plant, the equipment of which is included in the continuous technological process of processing raw cotton. The purpose of the cleaning operation is to maximize the release of contaminants from raw cotton before the ginning operation. This operation is one of the main and can not be excluded from the technological process.

Contaminants are divided into organic and mineral. For organic contaminants include particles of the cotton plant (leaves, twigs, leaf boxes, bract, the stalk) and other plants (birches, gumaya etc.). Mineral impurities are earth, sand, stones, dust, clay, crushed stone, etc.

In size, weeds are divided into large and small. Large weed impurities are conventionally called those that are not sifted through a reticulate surface having 10mm cells, and small ones that are sifted through such a surface.

By the nature of the cohesion, weeds are divided into passive and active impurities. Passive weed impurities are called those that are on the surface of the lobules or between the volutes. With a slight shaking, these impurities are separated from the raw cotton. Active weed impurities include those that are associated with individual fibers or a group of volatiles. They hardly stand out from raw cotton.



Mineral impurities are passive, they are located in all coordinates of a clump of cotton and with slight shaking are allocated from it. Large weed impurities are less passive, they are located on the surface of a lump or lobules of raw cotton and with considerable shaking force are separated from the fibrous part. Small weeds are active, since they are most closely related to the pulp. The geography of small impurities is very extensive. They are located both on the surface and inside the fibrous mass, so it is necessary to exert considerable force to isolate such a contaminants.

For the smooth and efficient operation of drying, cleaning equipment and gin, it is very important to remove the heavy mineral impurities from raw cotton. The inclusion of mineral impurities in the process is mandatory. Cleaners of mineral impurities, depending on the location of their installation in the process are divided into two groups: linear (which are installed in front of the separator) and non-linear (which are usually located after the separator). It is most expedient to remove mineral impurities from raw cotton before it enters the first technological machine in the course of the process.

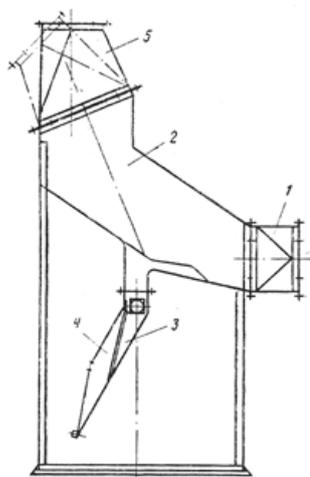


Fig. 6.1. Scheme of the trap of heavy impurities of mark 2ChTL
1-incoming pipeline; 2-chamber; 3-pocket; 4-valve; 5-outlet pipeline.

One example of such machines is a linear trap of mineral impurities 2ChTL (Fig.6.1). It is installed in the main pipeline line in front of the separator.

Linear trap of mineral impurities 2ChTL is quite simple in design.

Mineral impurities entering the mixture of air with raw cotton through branch pipe 1 are not only released as a result of impact of volatiles with impurities on the fixed surface, when the velocity is lost, with a sharp expansion of the cross section of the duct. 2. The impurities released from the raw cotton fall into the unloading chambers 3 and 4. The suction pipe is connected to the branch pipe 5.

The cleansing effect reaches 70-80%, and for weedy impurities of 5mm - 100%, and slightly less than 5mm - 92-93%. The productivity of the mineral impurities purifier is equal to the capacity of the separator, 12-14 ton / h. At a trapped air velocity of 22 m / s, the pressure loss is 292 Pa.

The main working organs of small contaminants cleaners are drums and mesh surfaces (Fig.6.2, 6.3).

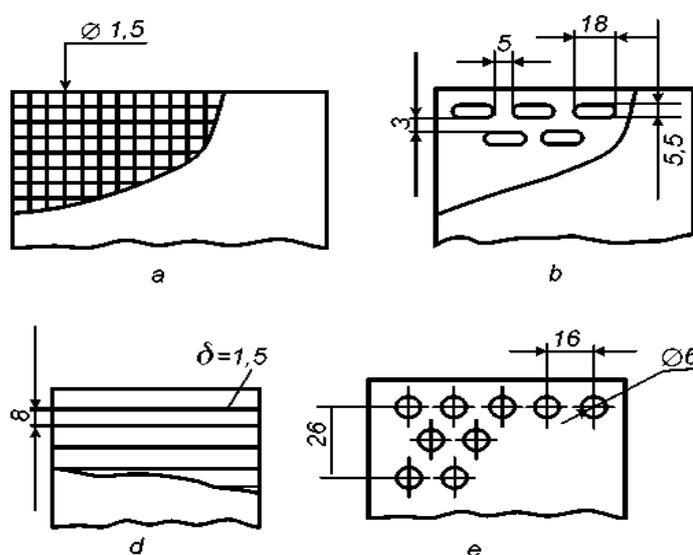


Fig.6.2. Mesh surfaces

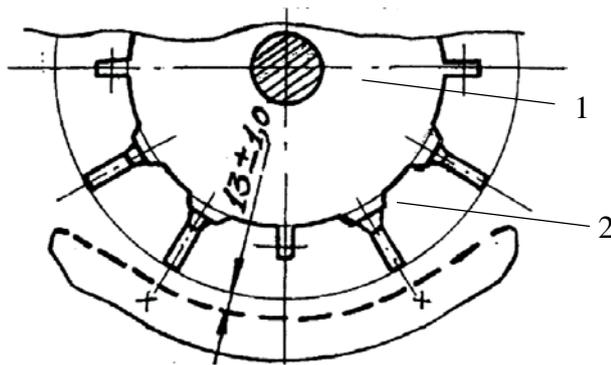


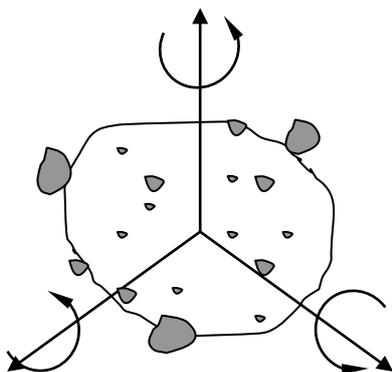
Fig.6.3. Scheme of the main working organs of the cleaner from small contaminants
1. Pin drum; 2. Mesh surface;

The cleaning effect depends on the correct mutual arrangement of the trowel and the mesh surface. Under the influence of the loosening-cleaning drums, the lobules and volatile cotton are repeatedly struck against the mesh surface. In this case, preliminary loosening of raw cotton takes place, the weedy impurities are separated, gradually sieved and removed through the mesh surface.

Functional values:

- 1) Pin drum - transportation of raw cotton particles over the surface of the mesh surface and creation of shock-shaking effects on raw cotton;
- 2) Mesh surface - ensuring the maximum allocation of weed impurities and not allowing the material to waste.

A clump of raw cotton in a spatial coordinate system must have the maximum number of degrees of freedom to ensure the efficiency of the cleaning process.



The maximum number of degrees of freedom is equal to 6. The module of the small sludge cleaner provides the maximum possible number of degrees of freedom for the raw cotton particle in the working gap (5 degrees of freedom) when the vertical movement is restricted (due to the mesh surface).

Technical characteristics of the cleaning module:

Diameter of the drum – 400 mm

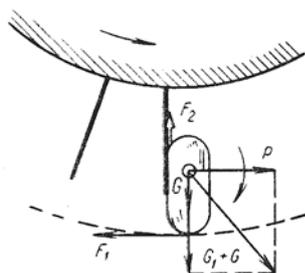
The linear speed of the drum is 9.42 m / s

The rotational speed of the drum wheel is 400 rpm

The gap between the pins and the grid is 14-18mm.

The theory of the purification process consists in examining all the forces acting in the cleaning zone and analyzing the technological situation (Fig.6.4).

In the drum cleaners, the following forces act on raw cotton:



- F_1 - is the friction of the volatility on the mesh surface;
- C_1 - centrifugal force;
- G - is the mass of cotton raw cotton;
- F_2 - is the friction of the fly about the surface of the pin;
- P - is the impact of a particle on a particle cotton.

Fig. 6.4. Model of cleaning from small contaminants.

The forces F_1 and P constitute a pair of forces and tend to turn the lobe clockwise. This leads to the creation of torque. The action of the torque plays a positive role. provides the maximum degree of freedom for a raw cotton particle during cleaning, but at the same time an extreme degree of torsion leads to particle twisting and burning, which is the cause of the formation of "soft" defects.

In the combined tapered-planetary drum of the cleaner each two longitudinal rows of pins alternate with the slats along the drum. The plank row of the drum creates a stream of air layer, which carries minor impurities out of the volcanoes emerging on the surface through the mesh surface.

Such a cleaner has a higher purifying effect. To these purifiers of raw cotton from small contaminants is 1XK (Fig.6.5)

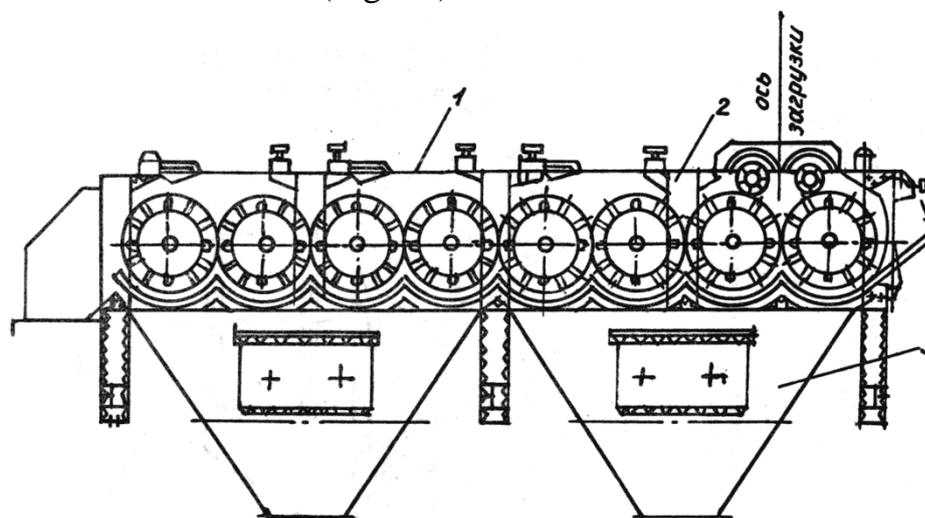


Fig.6.5. Cotton raw cotton cleaner 1XK
1-pin drums of EN-178; 2- stand; 3-bunker.

In such cleaners, pin drums are used which are arranged in a row in succession in the horizontal plane and work in combination with the mesh surfaces enveloping them from below. Above the first two sprockets in the course of raw cotton, there is a shaft with feeding rollers, whose diameter is 140 mm, and the gap between them is 10 mm. Rollers perform the function of supplying raw cotton. Under each section of the drums there is a bunker for the collection of weed impurities isolated from raw cotton. The number of reels is usually equivalent to 8 cleaning modules. This machine is part of the production line.

6.2. Technological operation of cleaning raw cotton from large contaminants

Raw cotton is cleaned from extraneous weed in the purification plant, the equipment of which is included in the continuous technological process of processing raw cotton. The purpose of the cleaning operation is to maximize the release of contaminants from raw cotton before the ginning operation. This operation is one of the main and can not be excluded from the technological process.

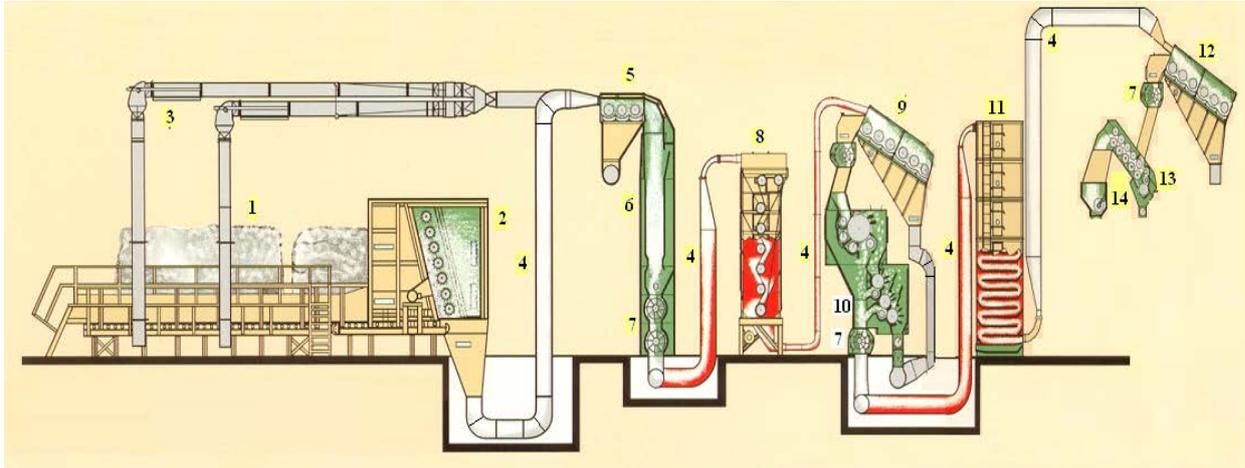


Fig. 6.6. The place of operation in the technological process of drying and cleaning from contaminants of USA

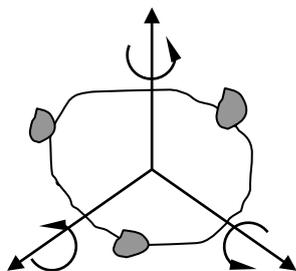
1-Cotton module; 2- Disassembler of Module; 3,4-Pipeline of pneumatic transport; 5-Trap of heavy impurities; 6-Separator; 7, 14 - Vacuum valve; 8, 11-Drier; 9, 12, 13-Cleaner of small contaminants; 10-Cleaner of large contaminants.

Large weed impurities are conventionally called those that are not sieved through a reticulate surface having 10 mm cells. These include the shutters of the capsules, large particles of branches and stems, etc.

The technological requirements for OKS are:

- 1) Ensure maximum cleaning effect;
- 2) Prevention of fiber and seed damage during cleaning;
- 3) Minimal waste material disposal with waste impurities.

As is known, large coarse impurities on the strength of adhesion to cotton occupy are rather passive and therefore are located only on the surface of a clump of raw cotton



But the fact is that $L_{\text{raw cotton}} \approx L_{\text{large contaminants}}$.

Therefore, the module for cleaning raw cotton from large weeds should provide a clump of raw cotton 3 degrees of freedom (rotation around its axes), because on the tooth of the drum set, only a clump of raw cotton is fixed in the center and can move freely along the axes.

The module of the large rubbish cleaner provides all these requirements (Fig.6.7).

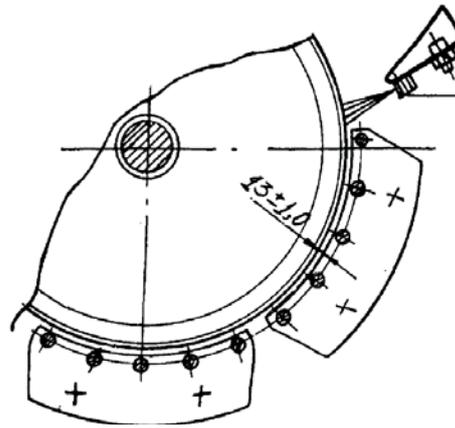


Fig. 6.7. The main working organs of a large cleaner contaminants

Technical characteristics of the large contaminants cleaner module

Table 6.1.

Parameter	Saw Drum	Brush drum
The linear speed (V)	7m / s	14 m / s
Rotational speed (η)	480 rpm	940 rpm
Diameter of the drum	480 mm	300 mm

Gap between the ribs – 30 mm

The distance between the drum and the rib is 12-14 mm

The speed of the saw pulp influences the centrifugal force, and if the linear velocity exceeds 7 m / s, the volatilization will be detached and the material will go to waste, t.

$$F_u = \frac{mV^2}{R} .$$

Received in the module of the purifier of large contaminants, raw cotton gets to the serrated drum, on the surface of which there are so-called teeth. Moving along with the drum, the raw cotton passes through the lapping brush, which, with its fixed bristles, spreads the volutes over the surface of the serrated drum and pushes them on the teeth of the saws.

Raw cotton

$F_{cb} F_{cb} = 40 \text{ g}$

1 (where g is the weight of raw cotton)

V pb large rubbish

The momentum of motion $S = Ft$ (const)

3 (where F is the force, t is the time of impact)

F_{str}

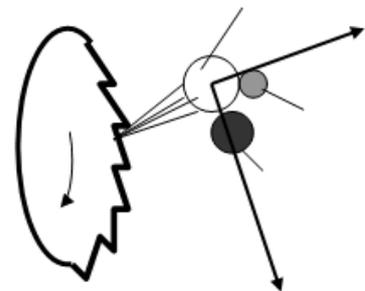


Fig. 6.8. Scheme of module for cleaning raw cotton from large contaminants

Further, with the movement of raw cotton, the volutes, mounted on the teeth of the serrated drum, are subjected to shock-shaking action on the grate bars, as a result of which the connection between the volatiles and rubbish is broken. Sor is subjected to centrifugal force and air flow through the gaps between the bars. Moving onward, the raw cotton passes through the guide flaps and is removed with a brush removable drum.

When a clump of raw cotton hits the grate, $F_x / s \ll F_{cr. sora}$, and $t_x / s \ll t_{cr.}$ sore, therefore, a large lump is detached from the clap of raw cotton (Figure 6.8).

Cleaners of large contaminants, as a rule, are formed from several cleaning modules and there are individual principle of operation and in the composition of production lines.

Cleaners of large weeds in the composition of production lines, as a rule, do not have feeding systems and are installed one after another along the course of the cotton flow. The performance of these machines is commensurate with the flow capacity. An example of such a cleaner is the saw cleaner 1XP (PX-1) and the cleaning section as part of the production line UXK (Fig.6.9).

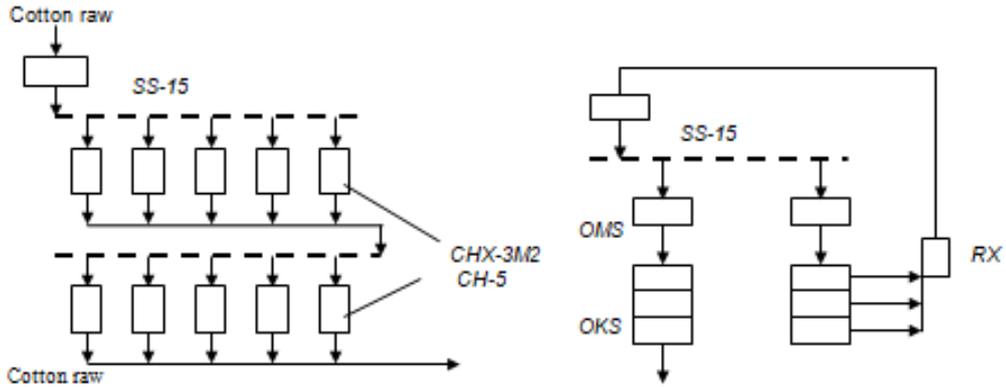


Fig.6.9. Scheme of the technological process for cleaning raw cotton



Fig.6.10. Cleaner raw cotton brand of UHK

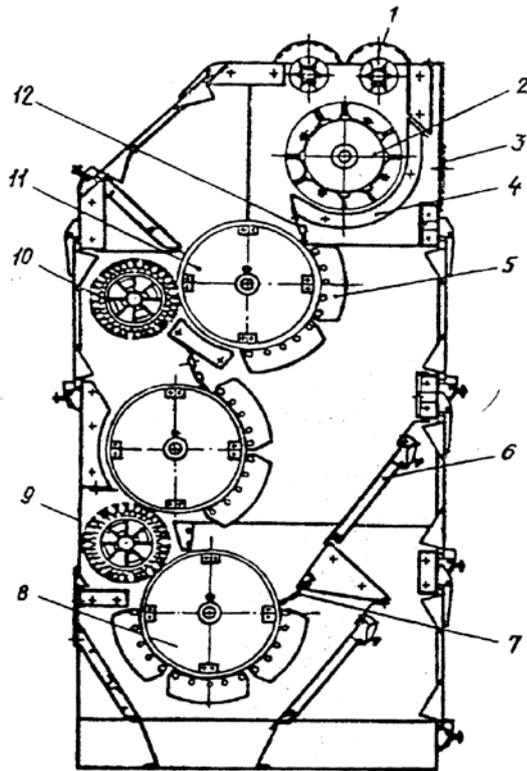


Fig.6.11. Scheme of cleaner brand of ChX-3M2

- 1 - feeding roller; 2 - pin drum; 3 - a flange for connection of a branch pipe of system of aspiration; 4 - grid; 5 - grate grates; 6 - the tray; 7, 12 - lapping brushes; 8, 11 - serrated drums; 9, 10 - brush drums

The purifiers of the individual principle of action have their own feeding system, which includes feeding rolls and a tapered-roll barrel. Such cleaners include the machines of the series ChX-3M2 (Fig.6.11) and ChX-5 (Fig.6.13) . These machines are installed in the cotton factories in succession in two lines of cleaning.

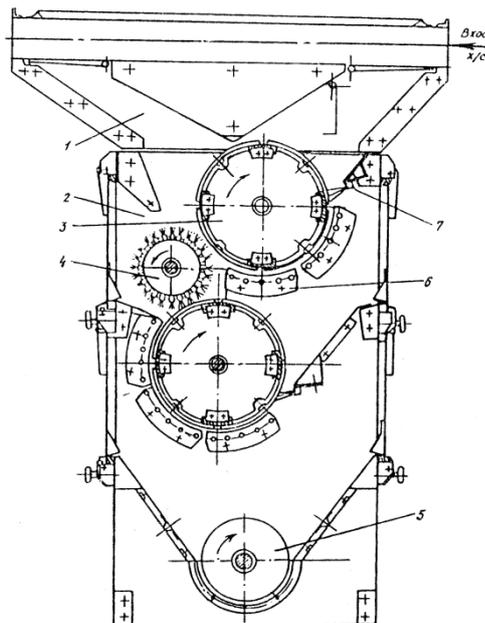


Fig. 6.12. Scheme of serrated cleaner of 1HP brand

- 1 - pneumatic feeder; 2 - normalized section EN.177; 3 - serrated drum; 4 - brush drum; 5 - screw conveyor; 6-grate grates; 7 - lapping brush.

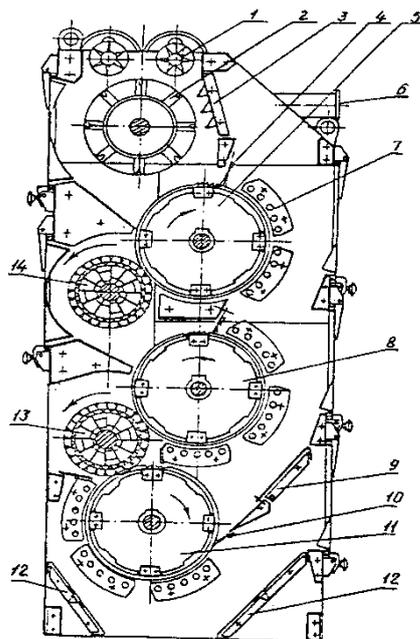


Fig.6.13. Scheme of the purifier of a large contaminants of mark ЧХ-5
 1-feeding rollers; 2-blade knife; 3-loosening deck; 5, 8, 11-serrated drums; 6-
 flange; 7-grate grates; 9,12-trays; 13,14 - brush drums.

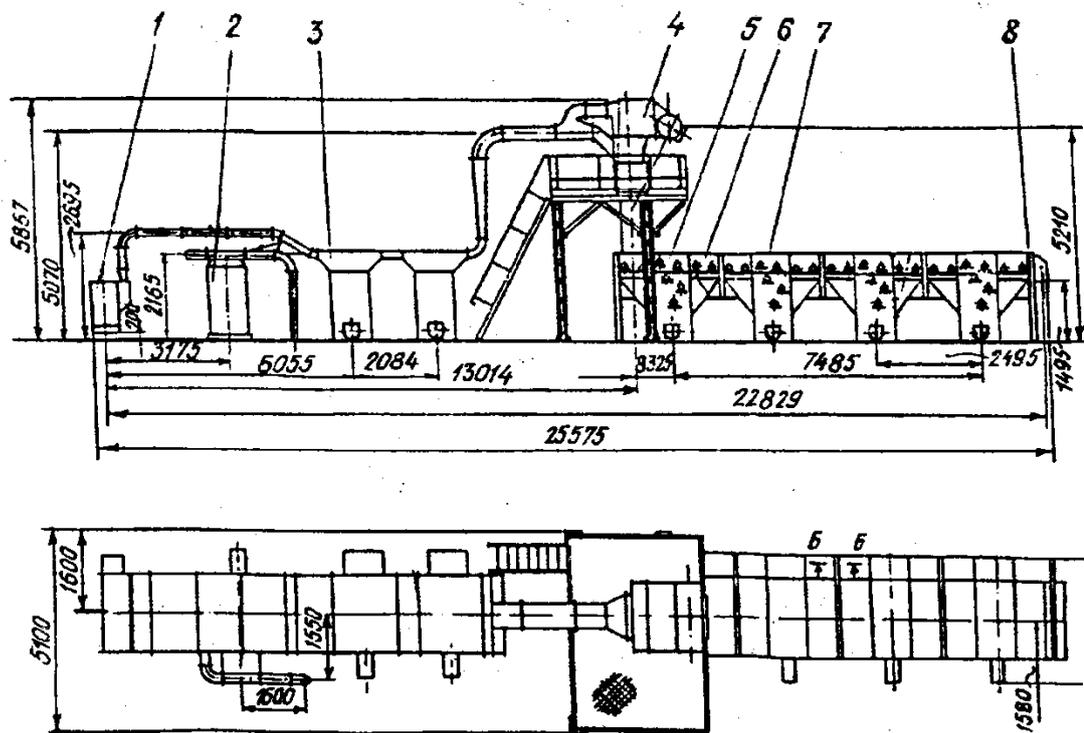


Fig. 6.14. Installation of cotton cleaners combined variety UHK
 1-feeder-trapper 1PU; 2-regenerator of raw cotton 1PX; 3- peeled raw cotton
 cleaner 1HP; 4- separator SX; 5- section of purification initial UHK01;
 6 - the block kolkovyy EN.178.02; 7- section for cleaning intermediate UHK.02;
 8-cleaning section final UHK.03

Table 6.2.

Cleaner	Productivity	Cleanning effect
ChX-3M2	3-3,5 t / h	70-75%
1HP	6-7 t / h	35-40%
CH-5	3-5 t / h	75-80%
UHK	6-7 t / h	85-90%

6.3. Calculation of the plan for cleaning the cotton plant

The contamination of raw cotton is characterized by two assessments: quantitative, determining the total content of contaminants in raw cotton, and qualitative, determining the dimensional characterization of contaminants and its connection with the fiber of raw cotton slices.

Sororous impurities are located both on the surface of raw cotton particles and inside its lobules and volatils with different degrees of cohesion. The fine weeds are deeply embedded in the fibers and require significant shock-shaking effects on raw cotton for their isolation. Large weeds are mainly located on the surface of raw cotton, have a weak adhesion to the fiber and more easily are separated from it.

The technological process envisages the use of a complex of machines and units installed according to certain schemes and their operation must be carried out in accordance with strictly established regimes depending on the quality of the raw cotton (selection, sort, collection, moisture, contaminants) and produced products.

Depending on the initial characteristics of raw cotton in primary processing at cotton gins, it is carried out according to the optimal scheme of the technological process, developed on the basis of the best practices of the enterprise, as well as the results of scientific research aimed at improving and developing technology and machinery of production

In the developed scheme the widest range is taken into account: humidity, weediness of processed raw materials and features of these indicators depending on the types of harvesting, selection and industrial varieties, shelf life, etc.

The purifying effect of an individual machine or unit is the ability, under steady-state operating conditions, to separate weeds and foreign impurities from the processed raw cotton.

The value of the purifying effect (K) is defined as the ratio of the mass of all the isolated weed and foreign impurities to the total mass of contaminants and impurities that enter the machine or aggregate together with raw cotton and expressed as a percentage:

$$K = \frac{G_1 - G_2}{G_1} \cdot 100\% \qquad K = \frac{G_{sor}}{G_1} \cdot 100\%$$

Where: G_1 , G_2 - respectively, the mass of contaminants and foreign contaminants in the raw cotton,

G_{sor} - he mass of contaminants and foreign contaminants, selected from raw cotton.

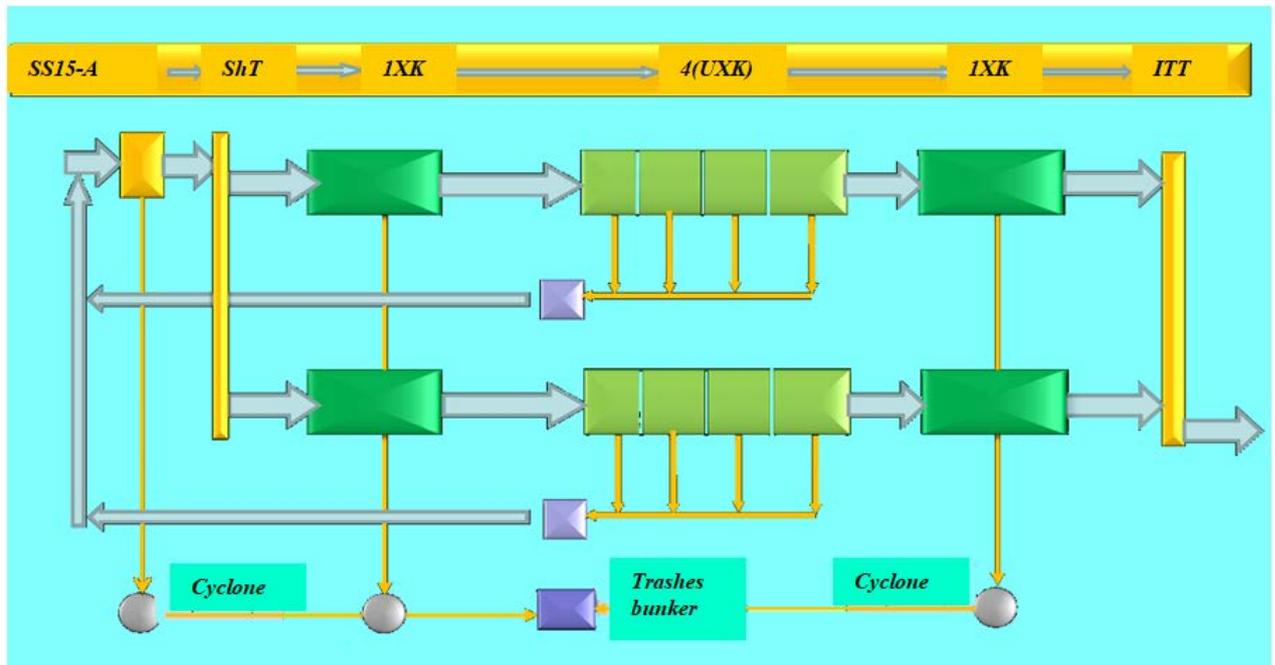


Fig . 6.15 . Scheme of technological process of a complex of UHK type

According to the above formula, the actual value of the clearing effect of an individual machine or aggregate is determined by passing through it a batch of raw cotton, previously knowing its original mass. Then, it is also necessary to determine the masses of isolated weed and foreign impurities or the weight of purified raw cotton. But this method is very laborious.

In practice, the cleaning effect of the machine is determined indirectly from the relationship:

$$\frac{C_1 - C_2}{C_1} \cdot 100\% \quad \frac{100(C_1 - C_2)}{C_1(100 - C_2)} \cdot 100\%$$

Where: C_1, C_2 - Cotton contamination before and after the cleaning process, %;

By the value of the cleaning effect of each machine participating in the technological process ($K_1, K_2 \dots K_n$), it is possible to determine the purifying effect of a separate workshop or plant as a whole:

$$K_{sum} = \left[1 - \left(1 - \frac{K_1}{100} \right) \cdot \left(1 - \frac{K_2}{100} \right) \dots \dots \left(1 - \frac{K_n}{100} \right) \right] \cdot 100\%$$

Where: $K_1, K_2 \dots K_n$ - cleaning effect of individual machines included in technological process of the shop or the shop itself, %.

If, in the technological mode of operation, the same type of machines are installed in series, then the cleaning effect of the following (in the course of the process) machine is determined by the formula:

$$K_{n+1} = K_n - \frac{K_n}{100} \cdot k\%$$

Where: k - is the coefficient that takes into account the reduction in the purification effect the following machines in consecutive operation $k = (28 \div 30)$;

Purpose of calculation: Make calculations to determine the purifying effect of equipment involved in the technological regime of the cotton industry, depending on the initial characteristics of the processed cotton (moisture, contamination, variety, type of harvest, selection).

Calculation of the plan for cleaning raw cotton

If the initial characteristics of processed raw cotton are known, such as: Selection variety; Industrial variety; Type of cotton picking (manual, machine); Initial contaminants of cotton, $C_1\%$; Initial Mote content of seed cotton, $Y_1\%$; The initial moisture of cotton, $W\%$; Planned output of fiber $B_f\%$; then the cleaning effect is determined by the known formula for each shop separately:

$$K_{total} = \left[1 - \left(1 - \frac{K_1}{100} \right) \cdot \left(1 - \frac{K_2}{100} \right) \cdot \dots \cdot \left(1 - \frac{K_n}{100} \right) \right] \cdot 100\%$$

For ease of calculation we take the average rate of the cleaning effect of cotton varieties.

I. Determined cleaning effect of the cleaning equipment and drying shop:

a) For contaminants:

$$K_{DCS}^{conta} = \left[1 - \left(1 - \frac{K_1}{100} \right) \cdot \left(1 - \frac{K_2}{100} \right) \cdot \dots \cdot \left(1 - \frac{K_n}{100} \right) \right] \cdot 100\%$$

b) For cotton mote:

$$K_{DCS}^{mote} = \left[1 - \left(1 - \frac{K_1}{100} \right) \cdot \left(1 - \frac{K_2}{100} \right) \cdot \dots \cdot \left(1 - \frac{K_n}{100} \right) \right] \cdot 100\%$$

2. The cleaning effect of the equipment of the cleaning shop.

a) For contaminants:

$$K_{CS}^{conta} = \left[1 - \left(1 - \frac{K_1}{100} \right) \cdot \left(1 - \frac{K_2}{100} \right) \cdot \dots \cdot \left(1 - \frac{K_n}{100} \right) \right] \cdot 100\%$$

b) For cotton mote:

$$K_{GS}^{mote} = \left[1 - \left(1 - \frac{K_1}{100} \right) \cdot \left(1 - \frac{K_2}{100} \right) \cdot \dots \cdot \left(1 - \frac{K_n}{100} \right) \right] \cdot 100\%$$

3. Determine the cleaning effect of the equipment of the ginning shop

a) For contaminants:

$$K_{CS}^{conta} = \left[1 - \left(1 - \frac{K_1}{100} \right) \cdot \left(1 - \frac{K_2}{100} \right) \cdot \dots \cdot \left(1 - \frac{K_n}{100} \right) \right] \cdot 100\%$$

b) For cotton mote:

$$K_{GS}^{mote} = \left[1 - \left(1 - \frac{K_1}{100} \right) \cdot \left(1 - \frac{K_2}{100} \right) \cdot \dots \cdot \left(1 - \frac{K_n}{100} \right) \right] \cdot 100\%$$

4. Determined cleaning effect cotton plants and production shops will be equal to:

a) For contaminants:

$$K_{TS}^{conta} = \left[1 - \left(1 - \frac{K_{DCS}}{100} \right) \cdot \left(1 - \frac{K_{CS}}{100} \right) \cdot \dots \cdot \left(1 - \frac{K_{GS}}{100} \right) \right] \cdot 100\%$$

b) For cotton mote:

$$K_{TS}^{mote} = \left[1 - \left(1 - \frac{K_{DCS}}{100} \right) \cdot \left(1 - \frac{K_{CS}}{100} \right) \cdot \dots \cdot \left(1 - \frac{K_{GS}}{100} \right) \right] \cdot 100\%$$

5. The total cleaning effect of production shops will be equal to:

$$K_{Summ} = \left[1 - \left(1 - \frac{K_{TS}^{Conta}}{100} \right) \cdot \left(1 - \frac{K_{TS}^{mote}}{100} \right) \right] \cdot 100\%$$

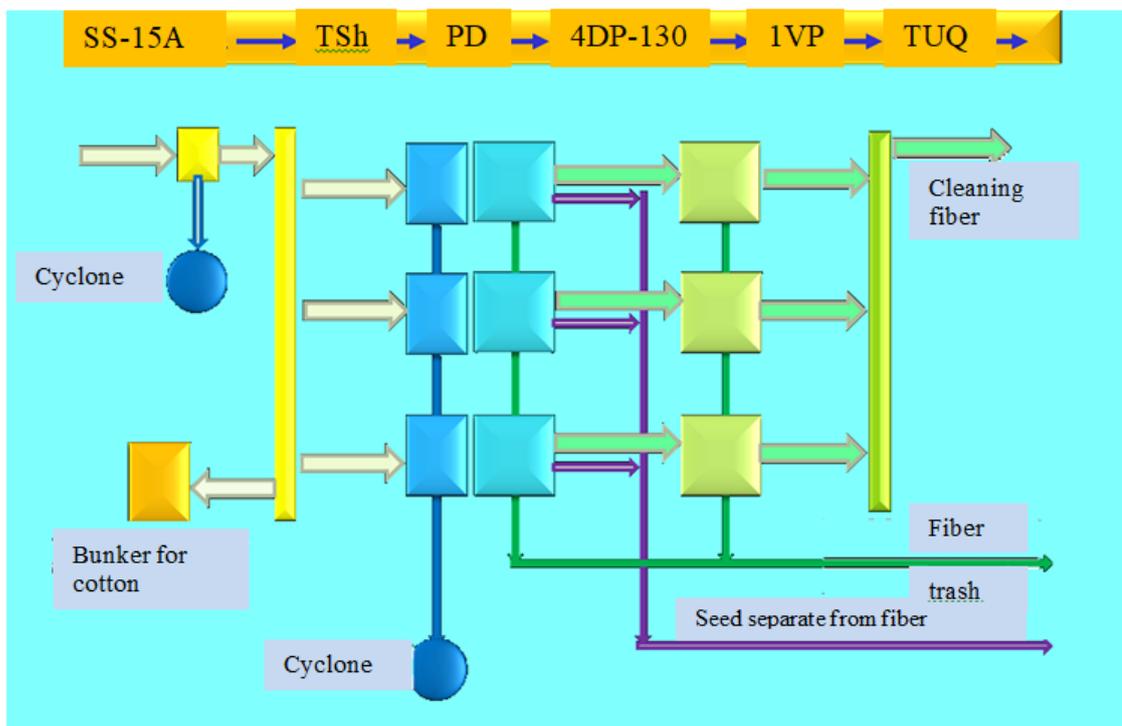


Fig. 6.16. The scheme of the technological process of saw ginning

Calculation plan for cotton fiber cleaning

6. The final weediness of raw cotton left after cleaning:

$$c_2 = \frac{100 \cdot c_1 \cdot (100 - K_{total})}{10000 - c_1 \cdot K_{total}} \%$$

7. Determine the content of mossy of cotton left in raw cotton after cleaning:

$$y_2 = \frac{100 \cdot y_1 \cdot (100 - K_{total})}{10000 - y_1 \cdot K_{total}} \%$$

8. The content of trashes and mossy of cotton in the ginning fiber (Fig.6.16.)

Will be equal to:

$$P_{gin} = \alpha \cdot \left(\frac{C_2 + Y_2}{B} \cdot 100 \right) \%$$

9. The content of defects and impurities in the fiber is determined after cleaning in a fiber cleaning machine:

$$P_f = \frac{100 \Pi_{gin} (100 - K_{total})}{10000 - \Pi_{gin} K_{total}} \%$$

Where: K_{total} - the cleaning effect of a fiber cleaner

Control questions:

1. Types of weed impurities, their features.
2. Technological requirements for the operation, the number of degrees of freedom of the material.
3. Module of large contaminants purifier, its elements and technological process.
4. The theory of the process of cleaning cotton on a large contaminants cleaner.
5. Equipment for cleaning raw cotton from large contaminants, its technical and economic indicators and installation in the process of the cotton plant.
6. The main technological parameters of a large contaminants cleaner.

Chapter VII

THE TECHNOLOGICAL PROCESS OF GINNING RAW COTTON

7.1. The technological process of ginning raw cotton

In the technological process of processing raw cotton, the operation of ginning is basic, since in this operation raw cotton as a multicomponent product ceases to exist and is divided into fiber and seeds. The operation of ginning at the cotton factories is usually carried out in the main building of the enterprise (Figure 7.1).

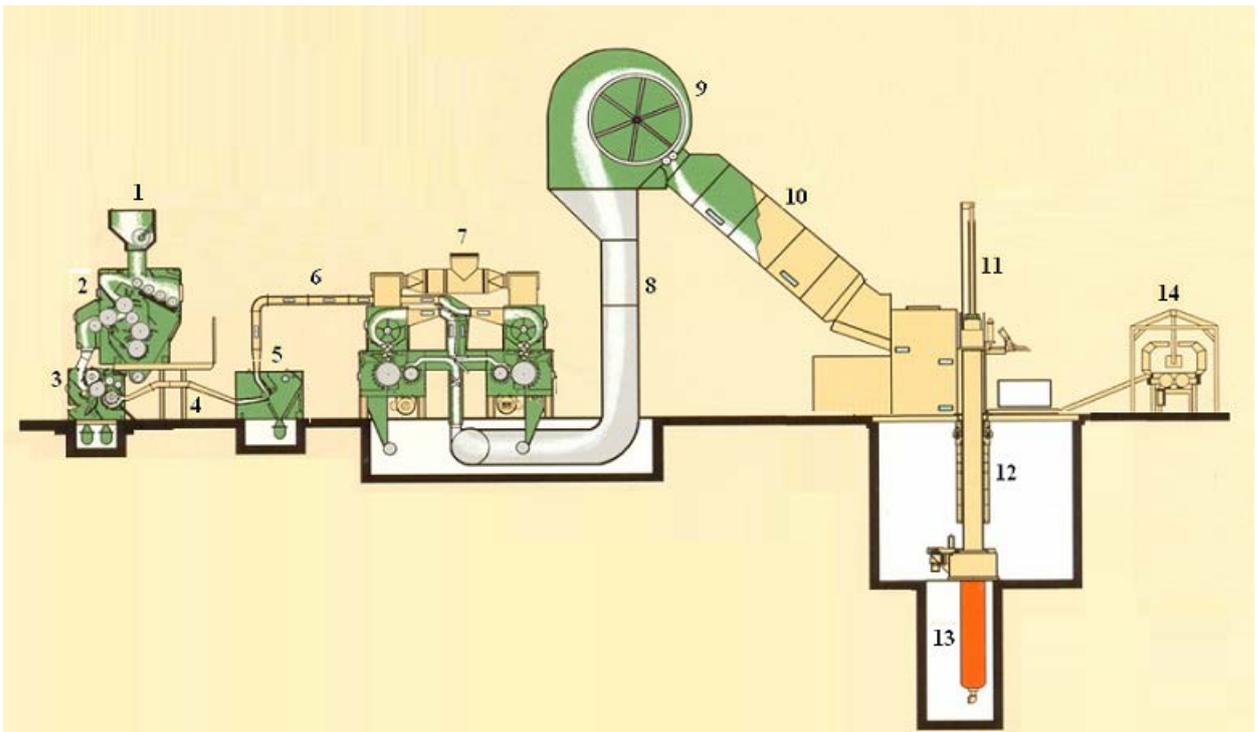


Fig.7.1. Sheme of the process technology of ginning process of USA
1-Screw; 2-Cotton cleaner; 3-Saw gin; 4, 6, 8-Pipeline; 5, 7-Fiber cleaner;
9-Condenser; 10-Humidifier fiber; 11-Trumbing; 12-Cylinder; 13-Pump;
14-Libra.

The essence of ginning is the capture and mechanical separation of fibers from seeds.

The strength (degree) of attaching fiber to seeds is 2-3 times less than the strength of a single fiber, so the fiber in the process of ginning breaks away from the seed, preserving its natural properties (length, fineness, maturity, breaking load, etc.).

Cotton ginning is performed on rolls and sawed gins. On the roller gins, fine-fibrous cotton of the first varieties is processed, and on the sawed ones - medium-fiber cotton of all sorts and fine-fibered low varieties.

Technological requirements for the operation

- 1) It is necessary to ensure the maximum separation of fiber from seeds;
- 2) The impact of the main elements of the ginning unit on raw cotton should not lead to damage to fibers and seeds;
- 3) In the fiber, after the ginning operation, the broken seed and large contaminants particles must not be contained;
- 4) The ginning node should be provided with process control systems.

7.2. Saw ginning

The raw cotton that comes into the working chamber is grabbed from the seed comb by the teeth of rotating saws, mounted on a shaft with spacers, and moves to the workplace of the grate (Fig. 7.2). Captured by the teeth, the cotton flies are connected to other cotton flies and inform them of the movement received from the teeth. As a result, the entire mass of cotton in the working chamber comes into rotation in the direction opposite to the direction of rotation of the saw blades. Thus, a rotating raw roller is formed, which ensures a continuous supply of cotton to the saw teeth, and hence the continuous productive work of gin.



Fig. 7.2. Saw gins.

The strands of fibers grabbed by the teeth are dragged in the workplace by the grates, separated from the seeds and transported to a removable device where airflow is removed from the saw teeth and transported to the battery fiber through the neck. The clearance in the workplace of the grate is 2.8 - 3.2 mm (less than the minimum size of the seeds), so the seeds are retained in this place and are carried away by the mass of the rotating raw roller until all fibers come off.

Seeds after the separation of all fibers lose their connection with the mass of the raw roller and are sent from the gin down the grate. The seediness of seeds emerging from gin is regulated by changing the position of the seed comb.

Because of the difference between the speeds of the raw roller and the saw cylinder ($V_b \ll V_p$), a rupture in the raw roller is formed, as a result of which the seeds do not accumulate, but drop out on the grate from the working chamber.

The speed of the saw is 12.2 m/s, and the air speed is 65-70 m/s.

For the steady process of ginning, the theoretical productivity of gin is determined by the formula:

$$\Pi = \frac{Q}{t_{cp}} \cdot A$$

Where: Q - the mass of the raw roller (kg);

t- is the residence time of the fiber and seeds in the working chamber of gin (c);

A- is a constant ginning coefficient.

Practical productivity of saw gin:

$$\Pi = \frac{60 \cdot H \cdot k \cdot B \cdot t}{1000 \cdot i \cdot p}$$

Where: H- is the saw blade speed;

B- is the number of saws on the shaft;

k- is the number of gin;

t- number of teeth on each saw;

i- number of fibers of the saw caught by one tooth;

p- is the number of fibers per gram.

Scientific studies also established the dependence of the velocity distribution along the profile of the working chamber (Fig. 7.3). And if the speed of rotation of the raw roller behind the bars is taken as 100%, then in zone E, where it reaches its maximum, the value is equal to 220%.

During the first 50 seconds in the working chamber, more than 97% of the fiber is separated and in the subsequent 50 the remaining 2 - 3%. But at the same time, the content of crushed seeds sharply increases.

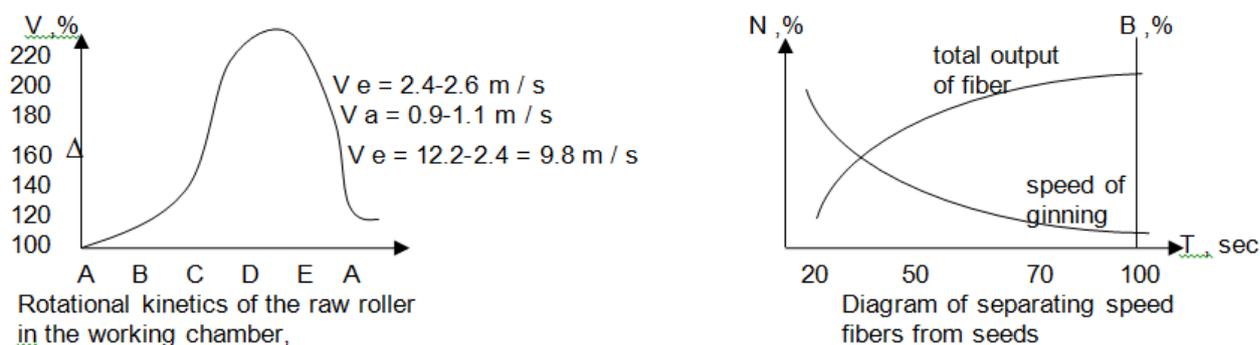


Fig. 7.3. The scheme of the dependence of the distribution of velocities along the profile of the working chamber.

The density of the raw roller during the operating mode of operation should be $\leq 550 \text{ kg/m}^3$

With a density of ≥ 550 to 650 kg/m^3 , the raw roller stops. The average weight of a raw roller usually reaches 40 to 60 kilograms.

7.2.1. Saw gin brand of 3HDDM

The gin should have 80-90 saws on the saw shaft, the dimensions of its working chamber are larger than those of the previous gin, which makes it possible to increase the productivity of gin to 12 kg of fiber per saw in an hour or more (Fig. 7.4).

The supply of gin with raw cotton occurs automatically and is regulated depending on the load current of the saw shaft drive. Lifting and lowering the working chamber, dumping from the chamber of a raw roller, shaking the camera in the face is also automated. During the shaking of the working chamber, the inter-cone gaps in the upper part are cleaned with saws due to the presence of a double chamber suspension.

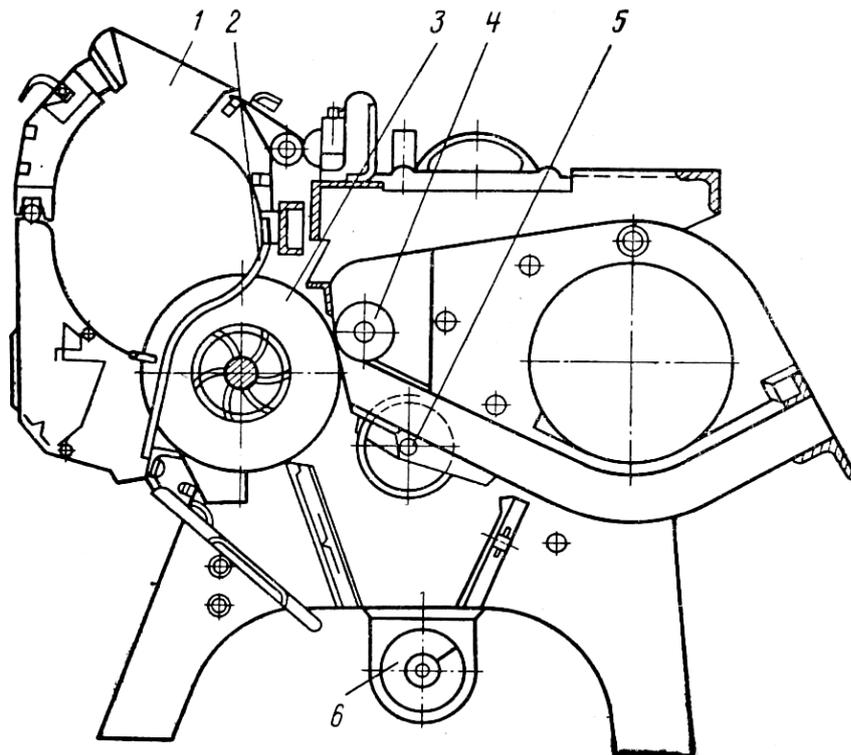


Fig.7.4. Scheme of saw gin brand of 3HDDM

1 - working chamber of gin; 2 – grate ; 3 - saw cylinder; 4 - mechanism for moving the removable device; 5 - the mechanism of the movement of the fuzz; 6 - trash conveyor.

The productivity per fiber per saw is 12.5 kph / hour;

The number of saws on the shaft is 80-90 pieces;

Cleaning effect is 25-30%.

7.2.2. Saw gin brand of DP-130

The saw-type gin of the brand DP-130 has high productivity and is equipped with a mechanism for lifting and lowering the working chamber (Fig.7.5).

In the design of this gin, a device is provided in the form of a scraper for cleaning the fuzz and feeding the dedicated waste into the discharge auger.

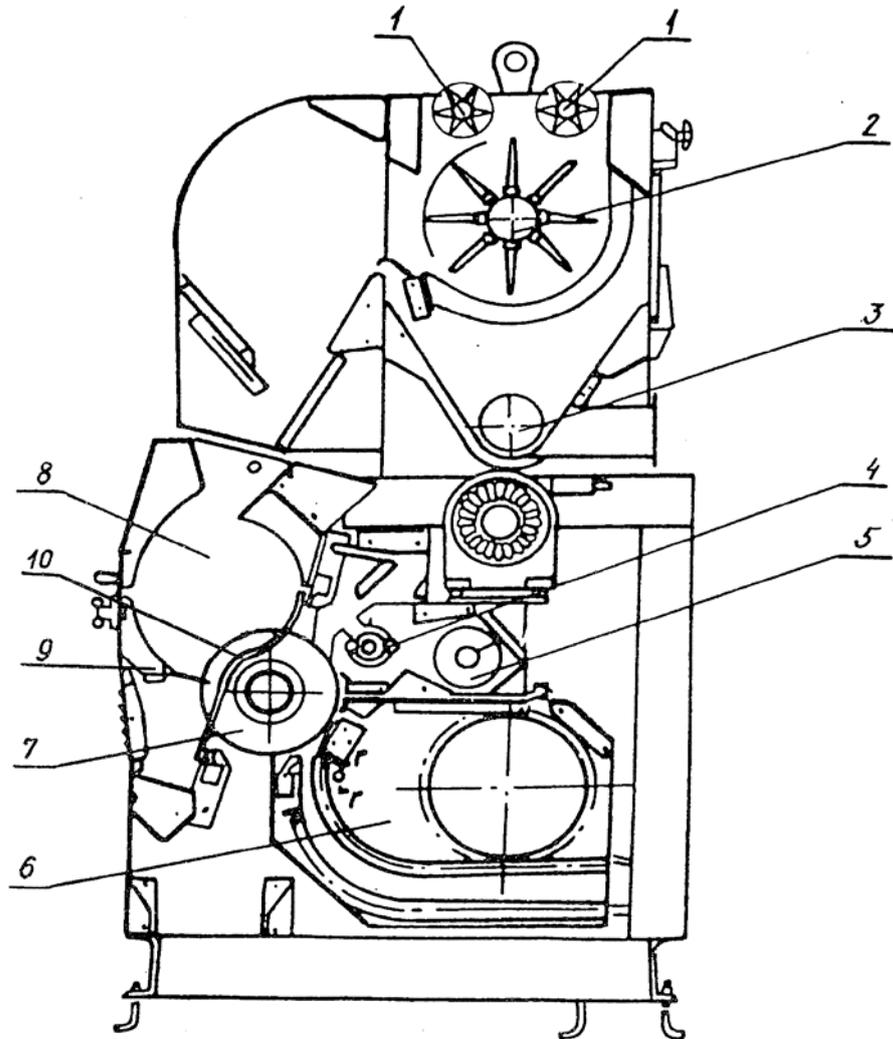


Fig.7.5. Saw gin brand of DP-130.

1 - feed rollers; 2 - pin drum; 3 - trash conveyor; 4 - scraper; 5 - a conventional conveyor; 6 - the air chamber; 7 - saw cylinder; 8 - working chamber; 9 - seed comb; 10 - grate.

7.2.3. Saw gin brand of 5DP-130

It is intended for separation of fiber from seeds of medium- fibrous varieties of cotton. The genie consists of a feeder, two working and air chambers , a saw cylinder, a control device with electrical equipment (Figure 7.6).

Loosening the cotton and adjusting the intensity of feeding raw cotton to the gin is provided by feeding rolls and a tin barrel. The design of the feeder provides for the

extraction of contaminants with a screw conveyor, trapping of metallic impurities by a magnetic board.

The lifting and lowering of the working chamber is mechanized. In order to increase the safety of maintenance, the machine is equipped with an electrodynamic braking of the saw cylinder, capable of instantly stopping it. The gin has a fiber cleaning section with the output of snail and contaminants from the machine. The basic electrical control circuit provides for manual and automatic modes work.

The use of the feeder with the isolation of contaminants, the availability of devices aimed at reducing the costs of manual labor, control and management, safety of maintenance, a special design of the grate as a whole ensure the stability of gin.



Fig. 7.6. Saw gin brand of 5DP-130

Technical characteristics of saw gin brand 5DP-130

Table 7.1.

Productivity per fiber, kg / h.	up to 2000
Air consumption for fiber removal, m ³ / s.	up to 0,8
Total cleaning effect,%	15
Power consumption, kW	80.25

7.3. Roller ginning

Roller ginning is intended for separation of fiber from the seeds of long-fiber cotton varieties. The essence of roller ginning consists in dragging the fibers of raw cotton against the stationary knife pressed to this shaft by the surface of the rotating working shaft and then cutting the seeds off the edge of the knife by the bouncer (Fig. 7.7).

The process of roller ginning is as follows: The raw cotton loaves from under the gin feeder are fed to the surface of the working roller, which is made from imitation leather KMK or RCM. A roller with a rough surface grasps the fiber of the fly and transports it to the ginning zone, where the fiber, due to the frictional force of the roller, is dragged behind the edge of the stationary knife, and the seeds can not pass into the gap. The baffle roller, with its blades, rotates, discards the seeds at the working edge of the knife and transports them along the mesh surface where the peeled seeds fall into the gaps of the mesh and leave the process. Ungrid seeds with a roller, re-return to the ginning zone.

The performance of the module is $P = 100 - 120$ kg. fiber per hour.

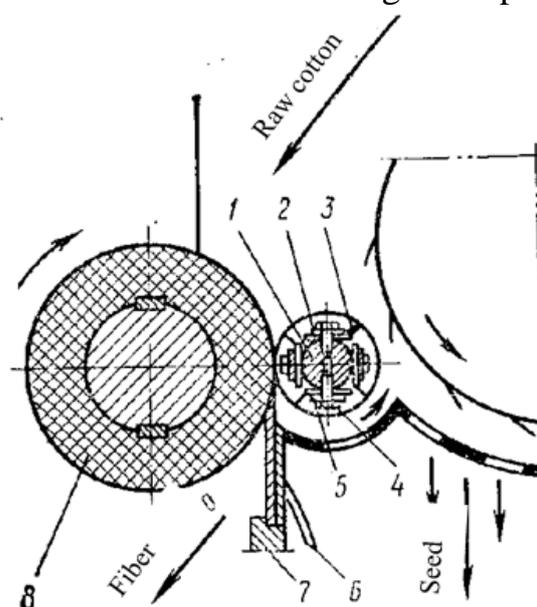


Fig.7.7. Diagram of the main working bodies of the gin module
1-shaft; 2-flexible shock absorber; 3-hammer; 4-bolt; 5-lath; 6-spring;
7-knife; 8-working roller;

The main working bodies involved in ginning are the working roller, the bump organ and the stationary knife (Fig.7.8).

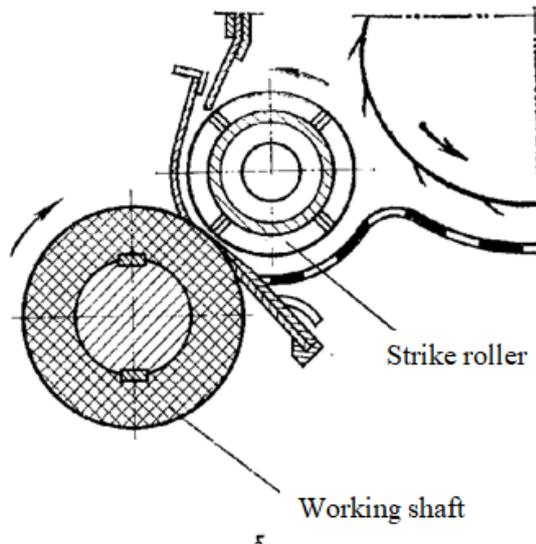


Fig.7.8. Scheme of roller gin with strike roller

The efficiency of the process depends on the condition of the rough surface of the working roller and the stationary knife, the force of pressing the stationary knife against the working roller, the speed of rotation and the diameter of the working roller, the design and operating conditions of the bump roller, the variety of processed raw cotton, etc.

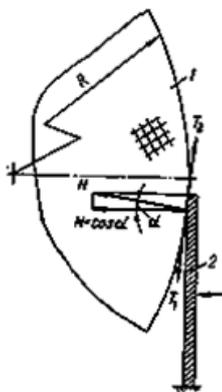


Fig.7.9. Module of roller gin.

A string of captured and tightened for a stationary knife fiber when discarding the seeds is held by the frictional force that arises between the knife and the working roller with the fiber. (Fig.7.9)

The strength of fiber separation from the seed without the participation of a bump device in the contact zone is determined by the formula:

$$P_0 = -P_2 + T_1 - T_2$$

where: P_2 - the component of the force N , which counteracts the tightening of the fiber under a stationary knife, H ;

T_1 and T_2 - the friction forces of the fiber against the

working roller and stationary knife, N .

$$P_2 = N \cdot \sin \alpha$$

where N - is the force of pressing the stationary knife against the working roller, H . ($N = 75 \text{ N/cm}$).

$$T_1 = \mu_1 \cdot \cos \alpha \quad T_2 = \mu_2 \cdot \cos \alpha$$

Where: μ_1 and μ_2 is the coefficient of friction of the fiber against the working roller, and the surface of the stationary knife.

Substituting the values, we get: $P_0 = N(-\sin \alpha + \mu_1 \cos \alpha - \mu_2 \cos \alpha)$

If the stationary knife is installed in such a way that $\alpha=0$, then

$$P_0 = N(\mu_1 - \mu_2).$$

7.3.1. The roller gin brand of DV-1M

It is intended for separation of fiber from seeds of fine-fiber cotton. In the feeder of gin cotton - raw is cleaned, leveled and evenly fed to the gin. The raw cotton fats are captured by the napping surface of the working roller, made from leatherette, and pulled under a knife tightly pressed to the working drum. The seed, stopped at the edge of the knife, is repulsed by a rotating bouncing organ (Fig. 7.10).

The gin is equipped with an individual regeneration section, which allocates non-guinea pigs. Minor metal impurities entering the machine are picked up by special magnets, and when large metal impurities enter the machine, a special device turns it off.



Fig. 7.10. The roller gin brand of DV-1M

Such gin is processed long-fiber cotton raw I, II and III varieties.

Cotton raw from the distribution screws is fed into the mines located above the gin (Fig. 7.11). Feeding paddle rollers 1 feed cotton raw material to pin drum 2 which pulls it over perforated mesh 3 and throws it onto tray 5 bringing cotton under the influence of needle drum 6. The needles of this drum string the cotton lobes and pass under the action of the screed blades 15 and the accelerating blades 14 reels. The bumper drum of the multi-impact action 12, rotating against the working edge of the knife 11, evenly feeds the raw cotton to the ginning zone and, with its blades, strikes the seed with a cotton fly pulled to the knife, tears the seeds from the fibers and drags them along the net 13 to the needle drum 6, which moves them along the working surface of the grid. In this case, the non-specified flybacks are returned to the working area for re-processing, and the bare seeds fall through the grid cells 13, in the gap between the grate 7 and are withdrawn from under the machine. The fiber,

carried away by the pile surface of the drum 10 . In the form of a densified canvas on the tray 9 is fed to the belt conveyor and then sent to the fiber cleaning.

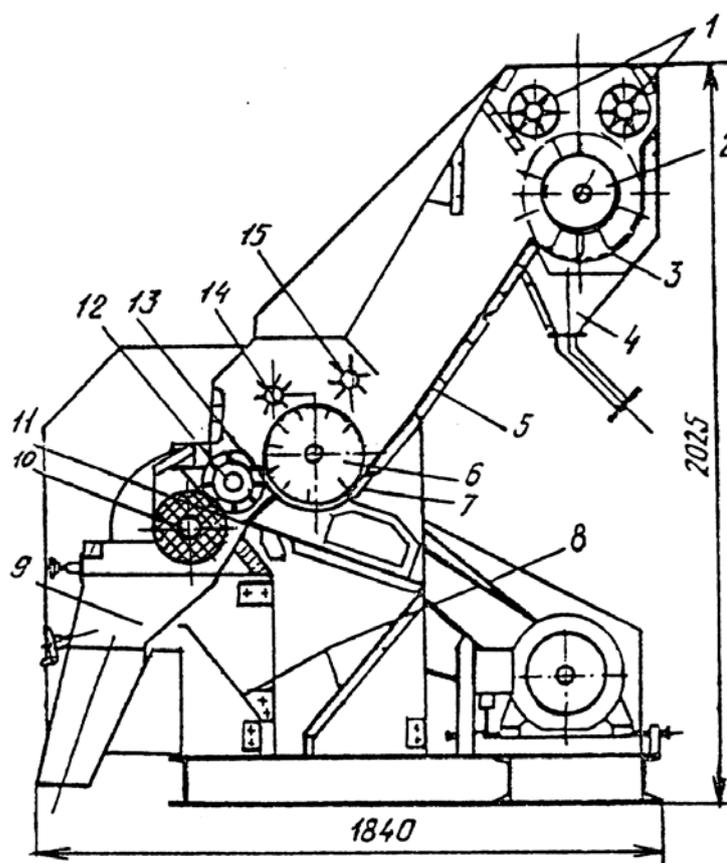


Fig. 7.10. Scheme of roller gin brand of DV-1M

1 - feeding rollers; 2 - pin drum; 3 - perforated mesh; 4 - drainage tray; 5 - the tray; 6 - needle drum; 7 - grate; 8 - the tray; 9 - the tray; 10 - working drum; 11 - stationary knife; 12 – strike drum; 13 - perforated mesh; 14 - accelerating roller; 15 - leveling roller.

Technical characteristics of the roller gin DV-1M

Table 7.2.

Productivity per fiber, kg / h.	100-130
Increase in mechanical damage of seeds,%	not more than 2
Power consumption, kW	10.5
Weight, kg	1414



Fig. 7.10. The roller gin brand of "Fenniks Rotobar"

Control questions:

1. The initial state of the product before the ginning process.
2. Technological requirements for the operation.
3. Module of jinfication of raw cotton of medium-fibrous varieties, its elements and their purpose, process technology.
 1. The theory of sawing ginning.
 2. The module of jinning cotton raw long-fiber varieties, its elements and process technology.
 3. The theory of the valine ginning process.
 4. Equipment for sawing and valine ginning, its technical and economic indicators.

Chapter VIII

TECHNOLOGICAL PROCESS OF LINTERING COTTON SEEDS

8.1. The lintering of cotton seeds

After the process of jinning, the seeds remain a cover consisting of relatively short fibers, called cotton linters (type A 7-8 mm and more and type B 7-6 mm or less).

Depending on the type of cotton processed, the amount remaining on cotton lint and deligne seeds varies and varies on average from 11 to 17% (to the initial weight of the seeds) for cotton of medium-fiber varieties and from 2.4 to 5% for long-fiber.

Linting is the process of removing lint from the seeds.

The technological requirements for the lintering process are:

- 1) When linting, the seeds and the natural properties of lint must not be damaged;
- 2) The lint must not contain crushed seeds;
- 3) It is not allowed to clog the lint with the skin with fiber;
- 4) In liner machines, it is necessary to provide for control elements and regulation of the pubescence of seeds.

8.2. The technological process of lintering cotton seed

Seeds coming out of the gin's working chamber have a significant degree of contamination with small contaminants, so to optimize the purification process, it is necessary to provide a technological transition-the preparation of seeds for the process of lintering, by cleaning it on special equipment.



Fig.8.1 Lintering of cotton seeds

Cleaning the seeds after ginning in a continuous process allows not only to reduce the weediness of the linter, but also to protect the teeth of the saw blades from damage and premature wear.

In Fig. 8.1. the scheme of the installation of the linter equipment in the main building of the cotton plant is shown, where the RNS is the regenerator of the non-seeded seeds; USM is a universal seed cleaner based on the air principle of action.

Its productivity is 7 tons per hour, the purifying effect is 25-35 percent, the catching effect is 91-100 percent, the content of seeds with pigtails is 8-15 percent.

Module of Seed Linter

- A. Working chamber:
- 6 1) front apron;
 - 1 A 2) the seed comb;
 - 3) grate;
 - 5 4) frontal bar;
 - 5) the tedder $V = 3,4 \text{ m / s}$;
 - 2 6) the density valve.
 - 7 V. Saw cylinder $V = 12.2 \text{ m / s}$;
 - 3 8 C 7) saw;
 - In 8) gasket between saw .
- C. Air-blowing equipment.

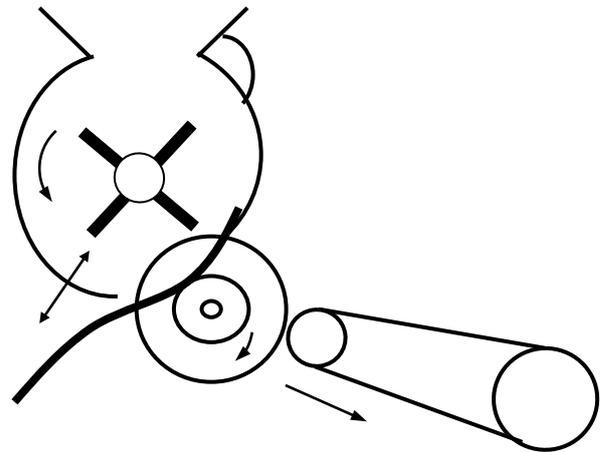


Fig.8.2. Scheme of the main working bodies of the linter

Through the upper open part of the chamber, called the neck, the seeds enter the working chamber. Through the clearances between the bars, saws protrude into the working chamber (Fig.8.2).

In the working chamber there is a tedder; when linking, the connection between individual seeds is weak and one pulse from the saw cylinder is insufficient for rotation of the seed in the working chamber of the linter. The role of the tedder is to rotate the seed roller and distribute the seed evenly over the saws.

The greatest impact of the saw teeth is on the seeds at the time when the seeds pass between the tedder and saws and near the work place of the grate. In these areas the seeds are most compacted.

Seeds after gin: fiber 10-15%, seeds 85-90%.

In contrast to the process of ginning (where the fiber breaks off), the process of lintering, in view of the fact that the fiber is shorter, the scraping of a short fiber from the surface of the seeds is carried out by the tip of the saw's tooth.

The speed of the movement of the tips of the saw teeth and the winches' strips influences the course of the seeding of seeds.

Circular speed of saw blades $V_n = 12.2 \text{ m / s}$.

The peripheral speed of the ends of the tie $V = 3,4 \text{ m / s}$.

Consequently, in the place of the shortest distance from the tops of the teeth, the relative speed of the teeth with which they cut into the stationary mass of the seed roller is equal to:

$$\Delta V = 12.2 - 3.4 = 8.8 \text{ m/s}$$

This means that the velocity gradient is scraping. In this regard, in the linter can be identified two zones of "A" and "B".

In the technological process of linting, linter machines of brands are used:

- 1) PMP-160 (Q = 1200-1300 kg. seeds / h, C = 2-3.5%)
- 2) 5LP (Q = 1500-1600 kg. seeds / h, C = 2-3.5%),

Where: Q - throughput by seed; C - percentage of removal of lint.

8.3. Linter brand of 5LP

Redesigned for the first and second removals of lint of cotton seeds after the ginning in a continuous process of cotton ginning plants. From the previously produced linter is distinguished by increased, in 1,5-2,0 times, productivity due to the increase in the volume of the working chamber (Fig.8.3).

The main components of the linter are the feeder 10, the body, the working chamber 4, the saw cylinder 16, the air chamber 13 (Fig.8.4).

Seeds are fed to the linters feeder shaft. The feeding drum 9 grasps the seeds from the shaft and drops them onto the screed drum 8, which drags them through the perforated grid 11 and uniformly feeds into the working chamber through the tray. Under the influence of the centrifugal force and the air flow created by the bar slats, the fine dust is released through the grid. The separated contaminants with a screw 12 is transported to the mouth of the gutter, from where it is sucked off by the pneumatic conveying system.



Fig. 8.3. Linter brand of 5LP

In the working chamber, when a tedder and a saw cylinder act, a rotating seed roller is formed.

The teeth of the saws are removed from the seeds of lint and dragged through the cracks of the grates. From the teeth of the saws, the lint is removed by the air flow leaving the nozzle of the air chamber, and is fed through the neck into the line outlet and further into the condenser.

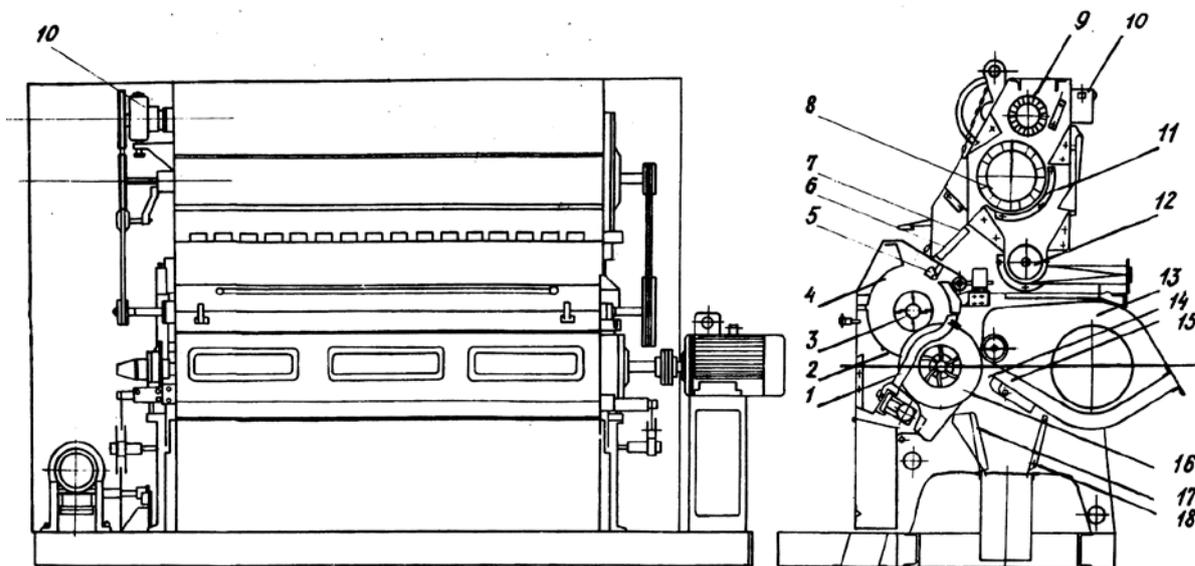


Fig. 8.4. Scheme of the linter 5LP

1-grate; 2-seed comb; 3-agitator, 4-working chamber; 5-valve density; 6-magnetic plate; 7-seed tray; 8-leveling drum; 9-feeding drum; 10-feeder of the linter; 11-perforated mesh; 12-core screw; 13-air chamber; 14-visor; 15-neck; 16-saw cylinder; 17-small tray; 18- large tray.

Mote and weedy impurities under the influence of centrifugal force are allocated through chutes 17 and 18, through the shaft they enter the collection conveyor, from which they are sucked into the cyclones by pneumatic transport. The seeds, extracted to the desired level, are extracted from the seed roller, roll down the grate and through trays enter the collection screw conveyor.

Theoretical productivity of lintering is determined by the formula:

$$\Pi_T = \frac{B}{t} \cdot K$$

Where: B - the mass of seeds in the working chamber;

t - is the residence time in the working chamber;

K- is a coefficient characterizing the lintering condition.

The productivity of a linter in production conditions is determined by the formula:

$$\Pi_l = \frac{Q \cdot C}{100}$$

Where Π_l - is the linter productivity per lint (kg / h)

Q - the passing capacity of the linter in terms of seeds (kg / h)

C is the percentage of lint removal.

Technical characteristics of the 5LP

Table 8.1.

Seed productivity, kg / h:	
the first time	2000-2300
the second time	1500-1700
the third time	1200-1300
Length, mm	3265
Height, mm	2095
Power consumption, kW	30.6
Weight, kg	2474

Control questions:

1. The initial state of the product before the linting process;
2. Preparation of seeds for the linting process;
3. Module for seed lining, its elements and technological process;
4. Equipment for seed lining, its elements and;
5. Theory of the linting process;
6. Technological parameters of the linter.
7. The main working nodes of the 5LP linter.

Chapter IX

TECHNOLOGICAL PROCESSING FIBER AND FIBER WASTES

9.1. Technological process of fiber and fiber waste cleaning

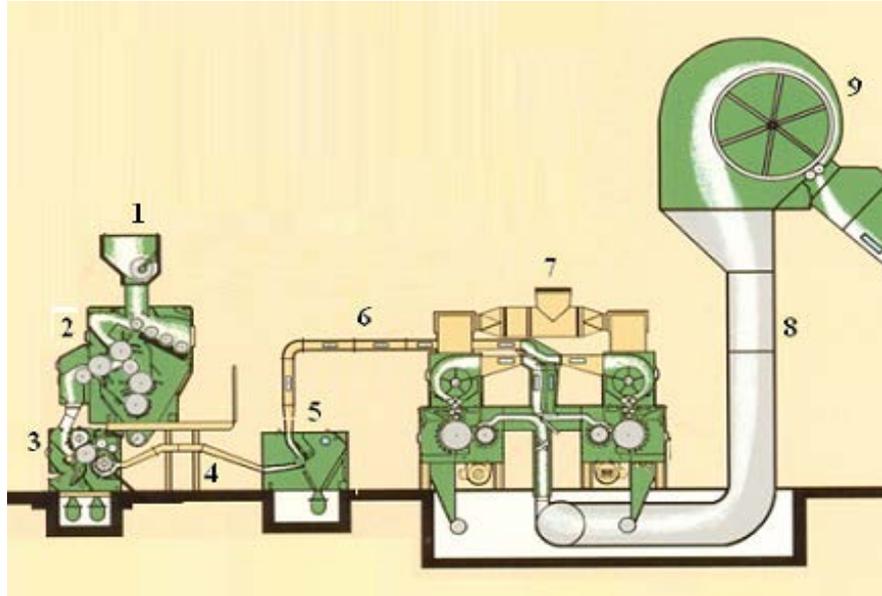


Fig.9.1. Scheme of the technological process of fiber cleaning of USA
1-Screw; 2-Cotton cleaner; 3-Saw Gin; 4, 6, 8-Pipeline; 5, 7-Fiber cleaner;
9-Condenser.

The fiber contamination after the ginning process is relatively equal to 2.8-3%. This exceeds the norm. Earlier, the fiber was not cleaned, but now, when the price of 1% of the contaminants in the fiber drops by 0.5%, this operation, from the economic point of view, plays a big role.

9.2. Methods for cleaning fiber

There are three methods to clean the fiber:

1 . The aerodynamic method of cleaning is based on changing the trajectory of the flow of cotton-air flow in the main line, due to the action of mass forces on the kinks, intensive cleaning of the fiber takes place.

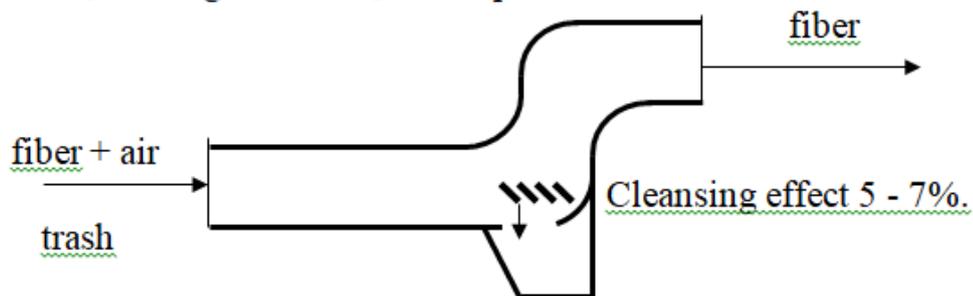
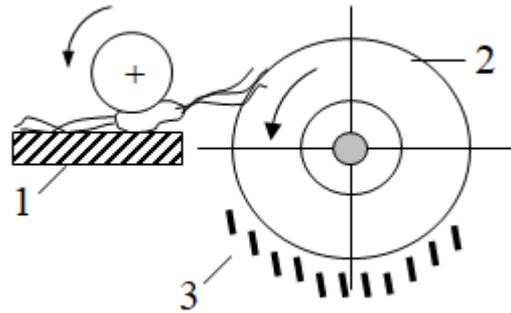


Fig.9.2. Scheme of aerodynamic fiber cleaning

2. Mechanical cleaning method



1 - feeding table; 2 - the saw cylinder; 3 - grate.

Cleaning effect 50 - 55%.

Fig.9.3. Scheme of mechanical fiber cleaning method

Here, cleaning is carried out by feeding the fiber layer with the feeding table 1 onto the headset of the cylinder 2 where the fiber beard is disintegrated and the captured fiber shreds by the cylinder 2 are cleaned of the contaminants on the grate 3.

3. Aeromechanical method of cleaning

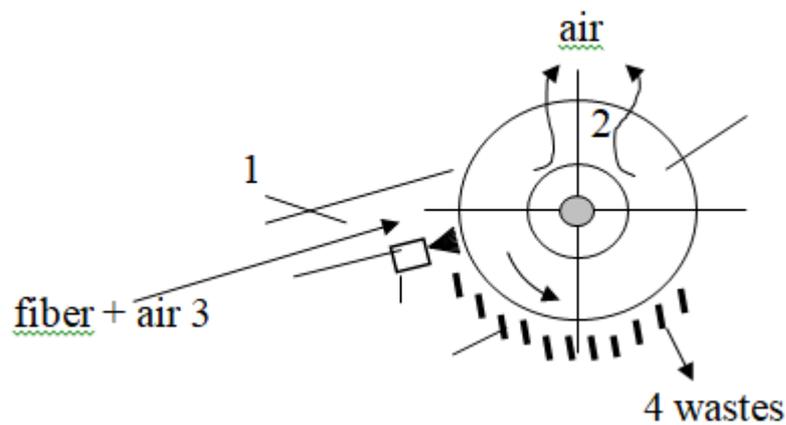


Fig.9.4. Scheme of aeromechanical fiber cleaning method
1 - inlet nozzle; 2 - saw cylinder; 3 - huller ribs; 4 - grate.

Cleansing effect 30 - 35%.

It is used on serial straight-through fiber wipers of cotton sawing plants. The technical process will be shown below.

9.3. Technological requirements applied to the operation

- 1) It is necessary to maximally isolate impurities from the fiber;
- 2) Prevention of fiber damage and loss of it to waste;
- 3) In the cleaners, it is necessary to provide for the elements of the control of the technological process.

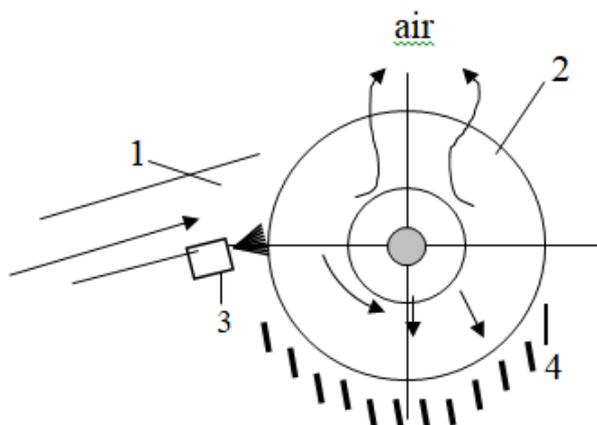


Fig.9.5. Scheme of the saw cleaning module
1 - Reception branch pipe; 2 - Saw cylinder; 3 - Huller ribs; 4 - Grate.

The cotton fiber, together with air, is sucked into the receiving cylinder and falls on the saw blades set at a pitch of 6 mm. The air leaves between the saws into the gaps, and the fiber settles on the saw teeth. Moving along with the saw cylinder, the fiber is rubbed with a lapping brush and more tightly attached to the saw teeth. Rotating further, the fiber strikes against the grate strips and the fiber continues to move.

Consider the process of cleaning the fiber in the saw blade module. Cleaning is carried out due to the shock interaction of the stranding of the fiber with the grate, as a result of which it is bent and combed by the edge of the grate, and considerable power loads are exerted on the fiber.

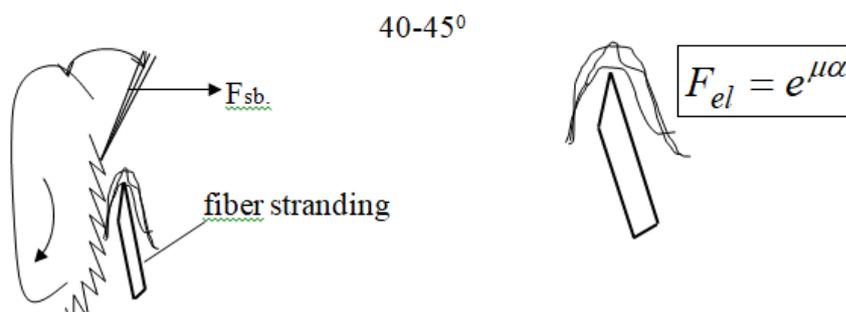
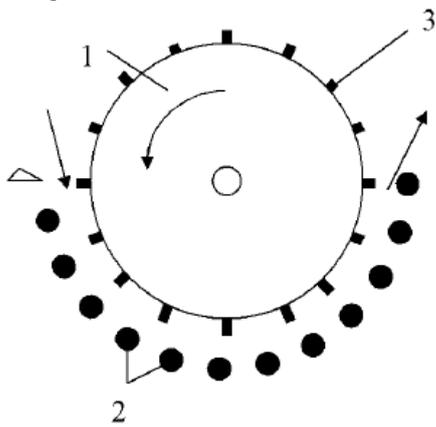


Fig.9.6. Scheme of the fiber cleaning process

Where F_{el} - is the Euler force; e - base the natural logarithm; μ - coefficient of friction fibers on the surface of the grate; α - The angle of the lock.

The drawbacks of this method are that, under load, the F_{el} fiber loses its modal length, and also a lot of fiber goes into waste (40% of the fiber in the waste).



Fiber cleaning module for long-fiber cotton varieties

- 1 - pin (knife) drum;
- 2 - grate;
- 3 - pin (knives).

The clearance between the ribs is 6 mm, diameter grate 10 mm. Cleaning effect 20-25%.

Fig.9.7. Scheme of the main working elements of the fiber cleaning module of longfiber cotton

The long, fibrous raw cotton is very delicate, so to keep its length use round grates and pin drum.

Fiber strands are fed to the pin drum 1 and hit by pins 3 on the grate 2. Due to the impact, the scum falls out of the scrap and through the gaps of the grate goes to the dust, and the cleaned fiber moves further.

Due to the impact of the grate stands out contaminants, which are derived through M_{kr} gaps between the bars. The resulting torque M turns and suspends the shred of fiber. Thanks to this shred receives strike by the next chaw.

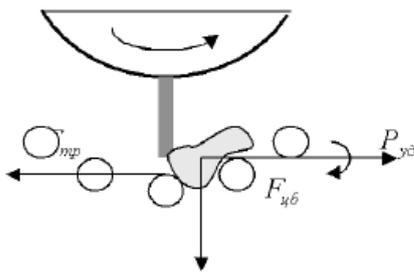


Fig.9.8. The scheme of the theory of fiber cleaning

9.4. Fiber cleaner for medium cotton varieties

In the cotton mills for cleaning fibers of medium-fibrous varieties, the following machines are used: 3OVP - for gin 3XDDM, 1VPU - for gin DP-130



Fig.9.9. Scheme of the cleaner of the brand 1VPU

The cotton fiber from the gin is fed through the neck 1 to the intake cylinder 2 where it is grasped and cleaned on the grates 4 from the contaminants, with air passing through the gaps between the saws of the cylinder 2 into the throat 9. Then, the fiber is transferred to the subsequent cylinders 7 and 8, where it is cleared of contaminants. Then the fiber is dropped by the headset of the cylinder 8 into the outlet throat 9. The control of the cleaning process is carried out by the louvered gratings.

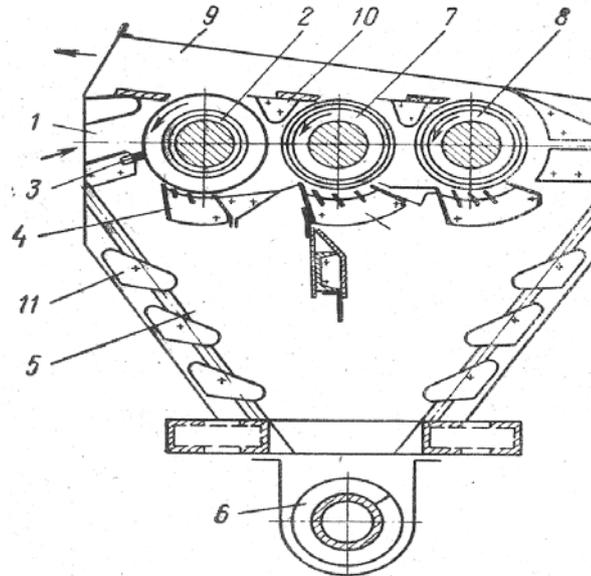


Fig. 9.10. Scheme of the fiber cleaner 3OVPM.

1- receiving the neck; 2-first cleaning cylinder; 3-brush; 4-grate; 5-dusts camera; 6-conveyor; 7-second cleaning cylinder; 8-third cleaning cylinder; 9-retractable neck; 10-guiding shield; 11-louvered grille.

9.5. Straight fiber cleaner brand of 2VP

It is intended for fiber cleaning in the continuous technological process of the cotton ginning plant. The machine can provide cleaning of 2000 fibers per hour, produced by 130-saw gin, showing a cleaning effect of 35 to 43%, which allows to obtain a fiber of standard quality. The installed power of the engine, which drives the three saw blades with the help of belts, does not exceed 15 kW (Figure 9.11).

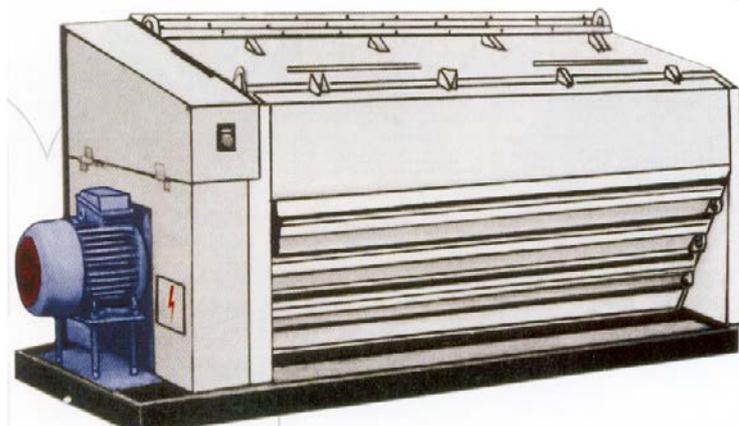
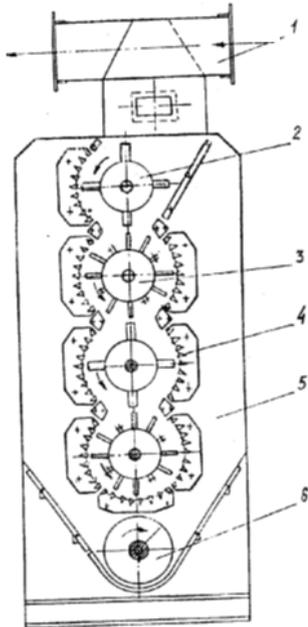


Fig. 9.11. Straight fiber cleaner brand of 2VP

9.6. Fiber cleaner for long fiber cotton varieties

Cotton fiber from under the stack of gin gins is fed to the machine, where it is cleaned on knife drums in series from the left and right sides of the grate bars and then the purified fiber is fed into the outlet pipe (Figure 9.12)



- 1- feeder;
- 2- knife drums;
- 3- pin drums;
- 4- grate plate;
- 5- weed chamber;
- 6- auger

Fig.9.12. Scheme of a fiber cleaner brand of VTM

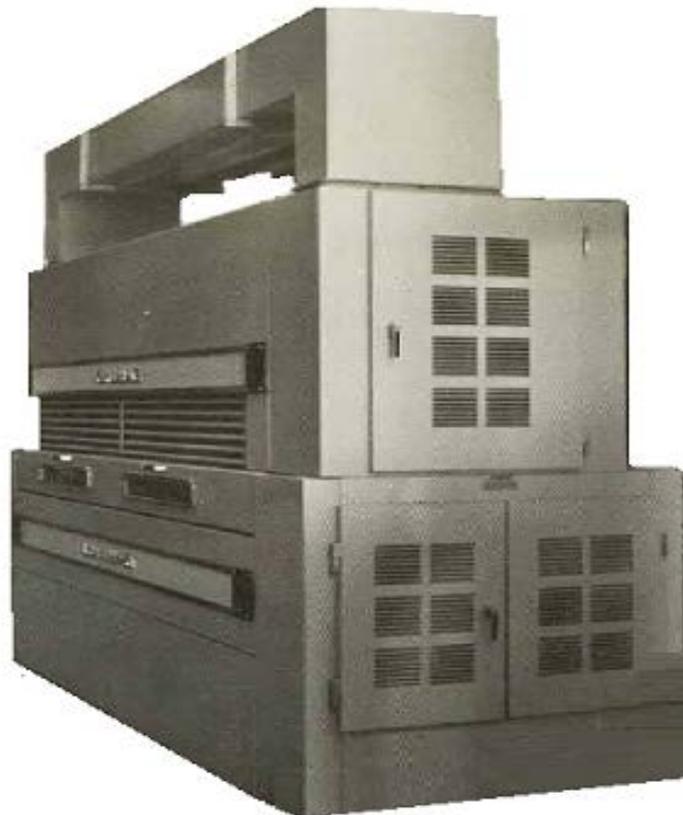


Fig.9.12. Scheme of fiber cleaner brand of "Sikstin D"

9.7. Processing of fibrous waste in a cotton plant

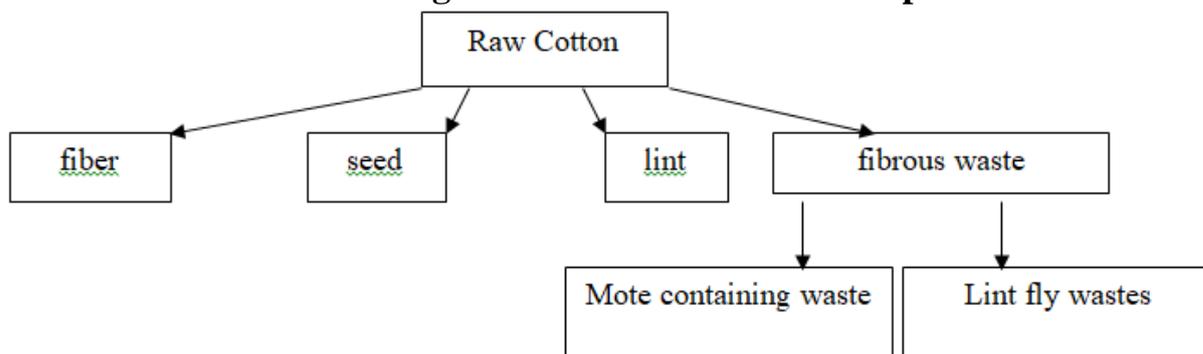


Fig.9.13. Scheme of obtained products from raw cotton

9.7.1. Fiber material cleaner - OVM

The OVM purifier is produced in two versions. One of them is used for purification of cyclone linters and linters, OVM-2 is used to purify snake from weed impurities in the continuous process of cotton ginning plants (Figure 9.14).

The productivity is 300 kg / h.

The cleaning effect (down of the cyclone) is 70%.

The cleaning effect (lint) is 30%.

The cleansing effect (mote containing waste) is 60%.

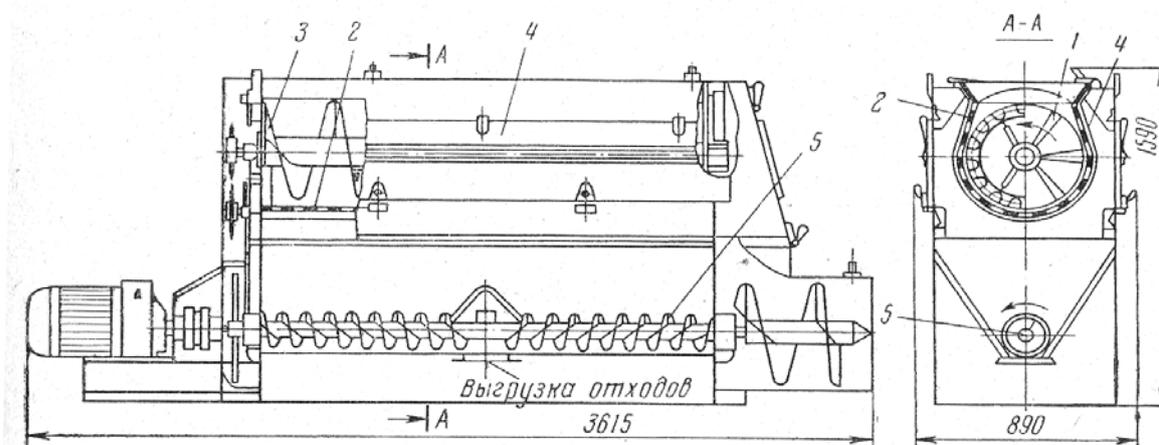


Fig. 9.14. Scheme of the cleaner of fibrous material of variety - OVM
1-drum, 2-mesh surface, 3-screw tamper, 4-casing; 5- conveyor for trashes.

Technical characteristics of cleaners OVM- I and OVM- II

Table 9.1

Brand	Type of material	View of mesh surface (mm)	Drum Type	Gap between the drum and the mesh (mm)
OVM-1	Lint; Lint fly wastes	3×2.5; Perforated D = 1.5	The pin	18-12
OVM-2	Mossy cotton	Cell 8×8	Strike pin	18-22

The recovered fiber is processed on a regenerator of the ROV or ROV-2 brand.

9.8. Calculation of technological parameters of fiber cleaners

1) Fibrous waste:

$$B = \frac{G_f}{G_{waste}} \cdot 100\%$$

Where, G_f - is the weight of the fiber in the waste, G_{waste} -the weight of the waste.

Cleaning effect:

$$K = \frac{G_{waste}(100 - B)}{G_1 S_2 + G_{waste}(100 - B)}$$

Where, G_1 is the mass of the purified fiber;

S_2 - the amount of rubbish and defects in the fiber after cleaning.

2) Coefficient of yield reduction:

$$K = \frac{B_1 \cdot B_2}{B_1} \cdot 100\%$$

where B_1 and B_2 is the fiber yield before and after the machine. Characterizes the loss of spinnable fiber into waste.

Control questions:

1. Place and operations in the technological process of the cotton plant and its economic feasibility.
2. Types and methods of cleaning fibrous materials, their advantages and disadvantages.
3. Cleaning of fiber medium-fibrous varieties of raw cotton, (module, theory of process).
4. Cleaning of fiber of finely fibrous varieties of raw cotton, (module, theory of process).
5. Equipment for cleaning fibers of medium and finely fibrous varieties of raw cotton, the place of installation in the technological process.
6. The main technological indicators of fiber-cleaning machines.

Chapter X

TECHNOLOGICAL OPERATION OF PACKAGING FIBER PRODUCTS IN COTTON MILLS

10.1. Technological process of fiber pressing

Previously, as such, no baling operation existed, it was replaced by a pressing operation. In our days, the code Uzbekistan began to deal with in-depth processing of fiber in the republic, the pressing operation became unprofitable. In particular, soft bales appeared and the pressing operation changed its name to the operation of packaging (Fig. 10.1).

The economic feasibility of the operation is the need to create a compact flat bale for its subsequent transportation. The fiber exiting the wipers and the lint of the linter machines have a density of 1 to 2 kg/m³, so the pulp must be pressed, that is, compacted.



Fig.10.1. Technological process of pressing the fiber

Transportation of pulp from the main body to the press shop is carried out via a conduit using condensers (Fig. 10.2).

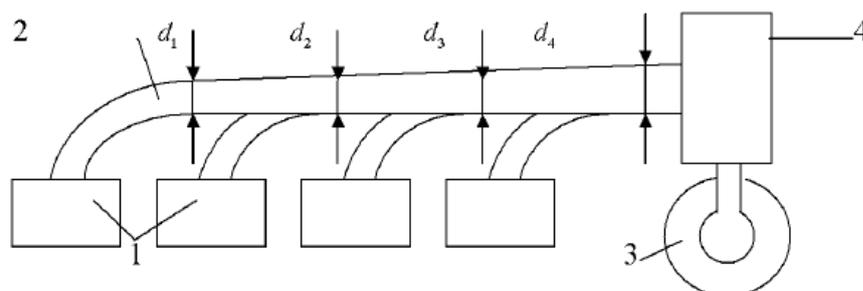


Fig.10.2. Scheme fiber retraction

1 - fiber cleaner (1VP or 3OVP); 2 - main pipeline main for fiber; 3 - centrifugal fan; 4 - condenser.

$$d_2 = \sqrt{2}d_1, d_3 = \sqrt{3}d_1, d_4 = \sqrt{4}d_1$$

There are a large number of different condenser designs, but they all have the same operating principle and consist of a reticulated drum, sealing and discharge rollers. The fibers are removed from the condenser drum by special removable rollers or by centrifugal force.



Fig. 10.3. Press shop of the cotton plant

10.2.Fiber Condenser brand of 5KV

It is designed for separating fiber from transported air and sealing it into a continuous canvas. (Figure 10.4)

At the top of the condenser housing is a reticulated drum through which most of the air is transported, transporting the fiber to the condenser through the fiber outlet. The flow of fiber from the mesh drum rotating at high speed is discharged onto the mesh sealing drums where the fiber stream is pre-consolidated into the canvas. Then the canvas of the fiber falls on the corrugated canvas-forming drums, from where, in the form of a sealing canvas, it is fed into the tray of a hydraulic press unit. The condenser provides for automated monitoring of the pre-bust condition. In comparison with the previously produced condensers, the new one has more economical indicators for the specific consumption of electric power, specific weight, reliability and ensures the safety of the personnel.

Technological requirements applied to the pressing process:

The mechanical impact on the fiber from the side of the press elements should not devariety its quality and lead to the destruction of the fiber, it is not allowed to lubricate the fiber when it is pre-pressed;

The uniformity of pressing throughout the bale volume and its bulk density should not exceed the permissible limits (5-7%).



Fig. 10.4. Fiber condenser brand of 5KV

Technical characteristics of condensers

Table 10.1

Characteristic	5KV	KL (KPV8)	KV 0.3	KVVB
Performance: - per fiber (kg / h) -per air (m ³ / s)	5000 12	3000 4,5	300 1.5	800
Power, kWt)	5.5	2.2	1.1	9.5
Diameter of the drum (mm)	1200	700	450	700

10.3.The press brand of DA-8237

The modern hydraulic plant with press DA-8237 (Fig. 10.4) for pressing cotton fiber consists of a roller feeder 1 for feeding fiber from the condenser to the tamping plate of mechanical tamper 2 and the press 3 itself with hydraulic pumps 4, 5, 6 and hydraulic communication 7.

The press is a revolver of three columns with two press boxes and one working plunger of the main cylinder.

The main cylinder plunger is driven by a liquid pumped by three hydraulic pumps.

In this press hydraulic locking of the doors of the press chamber, mechanized rotation of press boxes and fiber holders with rigid hook fastening is applied.

To mechanize the ejection of ready-made bale fibers from the presamera on the running plate, a special device is made-a chain bale ejector.

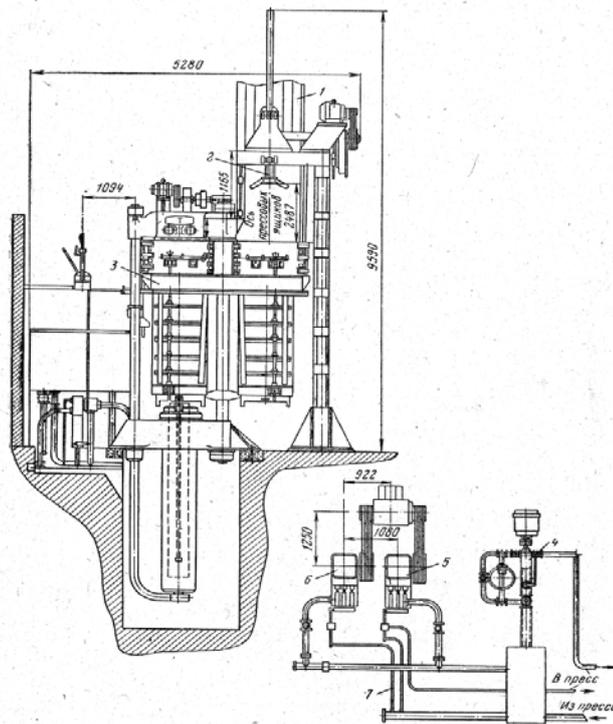


Fig.10.4. Scheme of press installation brand DB-8238

The process of pressing cotton fiber or lint, fed from the condenser feeder into the press box, is divided into two stages: tamping and pressing. This separation is very rational, since it makes it possible to apply press of the most compact dimensions, as a result of which the mass of individual components and components of the press installation is facilitated, its cost is reduced and the operating conditions are improved. The device of a complex hydraulic installation for pressing cotton fiber and lint in bales weighing 210-235 kg consists of: a mechanical rammer (1), a hydraulic turret press (2), two press chambers and press boxes (3), one press cylinder (4), and a semi-cylinder (5), the main three plunger pump (6), and an auxiliary worm-screw liquid pump with a dispenser (7), a reservoir (8) for the working fluid.

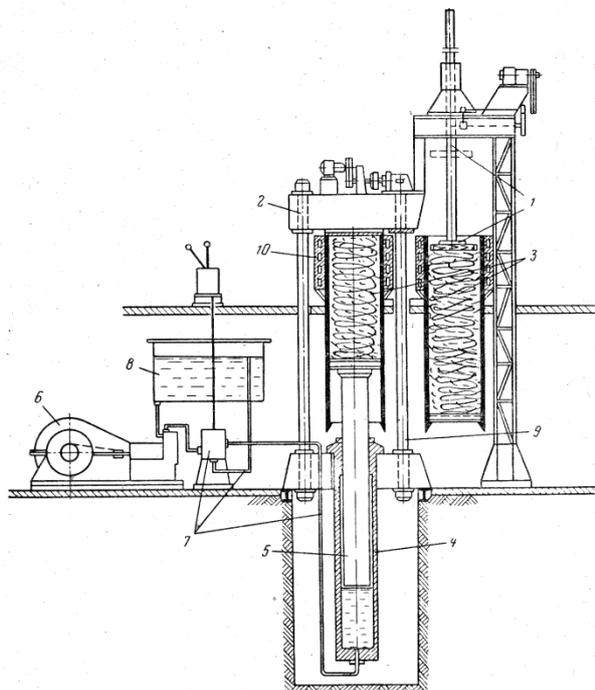


Fig.10.5. Hydraulic press installation scheme

When the fiber is packed into the press box (3) in an amount sufficient for one bale, the press boxes are rotated around the central press column (9) using a special mechanism, usually located on the upper beam of the press, such that the box with the compacted tamped fiber is positioned under (4), and the empty box under the tamping plate (1) (Fig.10.5).

After that, with the help of the switchgear (7), the fluid injected by the screw and then the plunger hydraulic pump goes into the working cylinder, lifts the plunger (5) with the movable plunger plate. At the same time, the fiber in the press box is compressed to a prescribed density of $900 \text{ kg} / \text{m}^3$, corresponding to the mass and size of the bale.

Before the end of pressing, the doors (10) of the press box are opened and the bales become open on three sides, and the fourth one is half-open. Formed in the press, a cotton pile, sandwiched between the top and bottom press plunger cushions, is covered with a cloth and tied with wire or steel belt belts. When the plunger is lowered the press, the packaged bale is pushed out by special mechanism from the prestress of the press.

10.4. Tramping of fibrous materials

Cotton fibers or lint coming out of the condenser and fed into the tamping chamber and press box by the feeder are compacted to $150 - 200 \text{ kg} / \text{m}^3$ during thrombosis and only after such compaction the pressing process is carried out.

If the boxes of the press were filled with a loose fiber with the same bulk weight as the feeder feeds, then these boxes would be huge. Other knots and details of the press were also cumbersome. Therefore, loose fiber before compacting is compacted by tamping.

At present, hydraulic presses for pressing cotton fiber use mechanical tampers of periodic action, with a constant stroke and an automatically controlled amount of fiber crimped in the press box, which determines the mass of the bale (Fig. 10.6).

Mechanical tampers are simple and reliable in operation, but the force of the tamping, developed by the ram piston, is not large enough.

The performance of the tamper should correspond to the performance of a gin battery or linter for the production of cotton fiber or lint, and the performance of the press itself. The technological task of tamping is to provide filling with a specified mass x / in the press box (215-230 kg). Therefore, the packing of the fiber in the press box occurs successively in the 18-22 trampling stroke (Figure 10.6)

The power of the press is usually called the force that the press plunger develops during pressing and is designated by P .

$$\text{For single-plunger press } P = \eta \frac{p}{100} 0,785D^2$$

$$\text{For a two-plunger press } P = \eta \frac{p}{100} 1,57D^2$$

Where, p - pressure of liquid in the working cylinder of the press at the end of pressing, N / cm^2

D - diameter of the plunger of the press, cm ;

η - coefficient that takes into account the loss of power spent on overcoming the friction forces of the plunger on the cuff or gland.

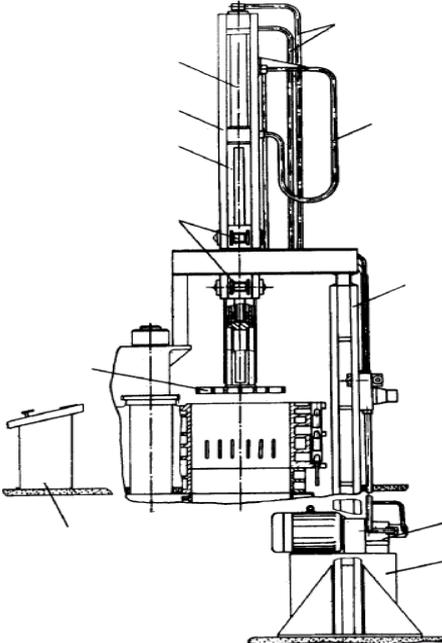


Fig.10.6. Tramping scheme of fibrous materials

Taking into account the moisture content of W cotton fiber in the range of 3.5-12% and the specific pressure (p) of 12-200 kg/cm², “Pahta Tozalash IICHB” recommends the determination of the density by the formula (kg/m³)

$$\gamma = \frac{6800}{44 - W} \sqrt[3]{p}$$



Fig.10.7. General view of the press installation of the brand Kontinental Igl

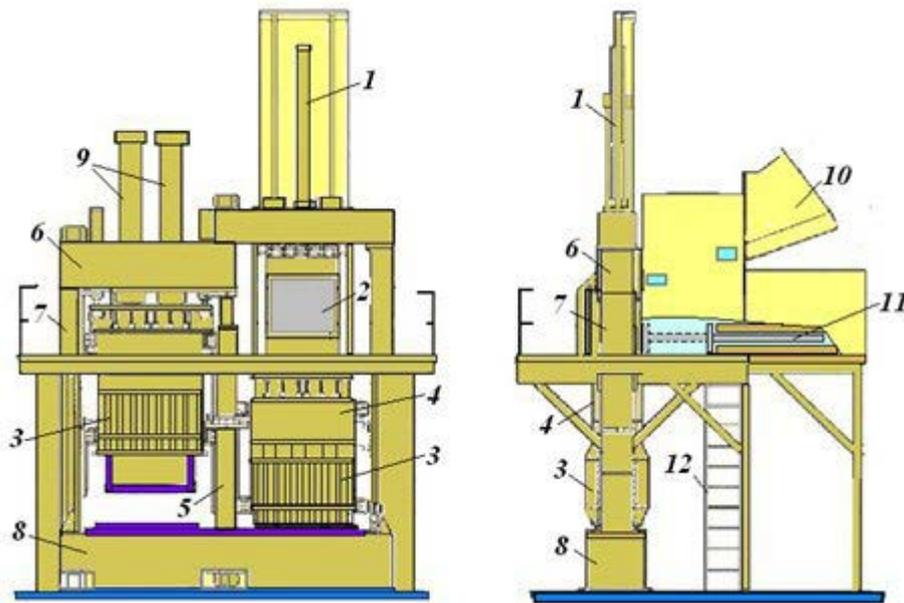


Fig.10.8-rasm. Scheme of press installation of Kontinental Igl Model-950
 1.Hydraulic tamping; 2. Fiber shaft; 3. Press chamber; 4. Press box; 5. Central stand; 6. Traversa; 7. Side stand; 8. Lower traversa; 9. Working cylinder; 10. Tray for fiber; 11. Guide for fiber; 12. Stairs.

10.5.Pressing of cotton fiber

The diagram of the working process of pressing cotton fiber during the plunger stroke 2750-2760 mm and the maximum pressure in the press cylinder is 3200 N/cm².

The hydraulic presses are an integral part of press units. The supply of pumps and the pressure created by them should correspond to the required nominal power of the press in order to ensure a normal density of cotton fiber pressing.

On the press unit - D 8237 there are three types of pumps: low pressure, medium pressure, high pressure.

MVN-10 (low pressure) 12.0 l / s; 250 N / cm²,

G 347 (medium pressure) 4.6 l / s; 600 - 1000 N / cm²,

G 364A (high pressure) 1.2 l / s; 3200 N / cm²,

For a normal supply of hydraulic fluid from the accumulator to pumps, the correct selection of the pipeline section and the thoroughness of its assembly are necessary.

The internal diameter of the pipes is checked by the formula (cm)

$$d = 0,46 \sqrt{\frac{Q}{v}}$$

Where: Q - flow rate through this pipe, l / min;

v - is the average velocity of the fluid flow, m / s.

The cross section of the pipeline blowing part with the loss of fluid leakage can be determined by the formula:

$$f = \frac{\alpha Q}{v_t}$$

Where: Q - flow rate;

α - coefficient of flow, taking into account the leakage of liquid;

v_t - is the velocity of the liquid in the pipe.

The main tasks of servicing press plants include: -to achieve the highest productivity of the press in the release of bales of normal overall dimensions and weight;

-timely conducting current inspections and preventive maintenance of the entire complex of main and auxiliary equipment of the press installation, including electric motors;

- adjustment and adjustment of working elements: pumps, tamping, press distributors, maintenance of the complete and permanent serviceability of their components and components;

- constantly monitor the normal condition of plungers of presses and pumps, valves of pumps and distributors, the condition of the cuff and stuffing boxes, as well as the hydraulic pipeline;

-Systematic control of the quality of the working fluid and filtering devices, the operation of automatic valve switches, the permissible operating pressure of the liquid, etc.

Control questions:

1. place and purpose of the operation in the technological process, its economic feasibility.
2. Press cycles and their technical and economic indicators.
3. The process of tamping cotton fiber, the diagram of tamping, schemes and technical and economic indices of ramming.
4. The diagram of pressing.
5. Hydraulic pumps and hydraulic communications of hydraulic press DA-8237, their order of inclusion and technical and economic indicators.
6. Maintenance of press installations.

CHAPTER XI.

STANDARDIZATION AND CERTIFICATION OF COTTON PRODUCTS, REQUIREMENTS TO ITS QUALITATIVE CHARACTERISTICS

11.1. Standardization and certification of cotton products

Differences in the types of cotton, soil and climatic zones of its cultivation, unequal agrotechnical methods of cultivation and harvesting cause different physical and mechanical properties and qualitative characteristics of cotton. This, naturally, is reflected in market prices when selling cotton. Obviously, the higher the quality, the more expensive the cotton and vice versa, the worse its quality, the cheaper it is. It was in this connection that there was a need for standardization and certification of cotton.

In the process of creating a new national economy, the state standards of Uzbekistan were introduced for all types of cotton products, including:

- raw cotton;
- cotton fiber;
- lint;
- seeds of sowing and technical cotton.

The standards for cotton products are divided into:

- technical conditions;
- test methods.

The standards for specifications include, basically, the technical requirements that production products must meet. The standards for test methods set out the methods for performing measurements of those indicators that are specified in the technical requirements.

11.2. Standards for raw cotton

According to the State Standard of Uzbekistan O'zDst 615 - "Raw cotton. Technical specifications» raw cotton, depending on the physical and mechanical properties of the fiber is divided into 9 types, taking into account the norms indicated in Table. 11.1.

In addition, raw cotton of each type, depending on color, appearance and maturity, is classified into five varieties, indicated in Table. 11.2 and in accordance with the samples approved in accordance with the established procedure. In this case, the variety of raw cotton is set according to the worst indicator.

Table 11 .1

Indicator name	The norms for cotton fiber types in raw cotton								
	1a	16	1	2	3	4	5	6	7
Staple mass length, mm, not less than	40.2	39.2	38.2	37.2	35.2	33.2	31.2	30.2	29.2
Linear density, m tex, more	125	135	144	150	165	180	190	200	more than 200
Specific breaking load: 1st variety, basic gs / tex	36.0	35.0	34.0	32.0	30.0	26.0	24.5	24.0	23.5
	37.0	36.0	35.0	33.0	31.0	27.0	25.5	25.0	24.5
2 sort not less than: g / tex	35.0	34.0	33.0	31.0	29.0	25.5	24.0	23.5	23.0

Table 11 .2

Cotton variety	Coefficient of maturity by types of cotton fiber, not less than		Color and appearance of fiber in raw cotton by types	
	1a,1b, 1,2,3	4,5, 6,7	1a,1b,1,2,3	4,5,6,7
I	2,0	1,8	White or white with a natural cream shade, a mauve tinge or cream, depending on the selection variety or the area where the cotton grows. Brilliant and silky in appearance.	White or white with a natural shade, a shade or a cream shade, depending on the selection variety or the area where the cotton grows.
			Elastic and dense to the touch. The raw cotton slices have a ripple over the entire surface, and the raw cotton of the machine collection consists of individual volutes and stretched lobules with slightly twisted fibers. Occasionally, a dead fiber may occur on individual lobules.	
II	1,7	1,6	From matte-white to cream with shades and small yellow spots. The gloss and silkiness is lower than in I variety.	From matte-white to cream with pale yellow patches.
			Less elastic and denser than the first variety cotton.	

			Slices of raw cotton cotton have a fibrous effect on the entire surface, and the raw cotton of the engine collection in its mass consists of separate volutes and stretched lobules with a twisted fiber, and there can be a dead fiber in the form of a small shiny plastic.	
III	1,4	1,4	From matte-white to creamy or yellow uneven color with yellow spots. Grayish shade, almost without a shade.	From dull white to creamy - yellow with yellowish spots with matte grayish shade.
			Slices of manual cotton have a small waviness, changing into shiny plastic of different sizes, and raw cotton from the engine collection consists of separate volutes and stretched, partially fluffed and twisted lobules with a dash of individual unstretched immature lobules, contains shiny plastic of various sizes.	
IV	1,2	1,2	Yellow and pale yellow uneven coloration with a gray tinge and brown spots. Without shine.	From dull white and cream to yellow cream with a gray tinge and brown spots.
			Not elastic and not dense to the touch, in its mass consists of stretched partially twisted lobules, as well as from unstretched immature lobules, separate groups of volleys of varying degrees of fluffiness, most of the lobules have a dead fiber in the form of a shiny plastic.	
V	less 1,2	less 1,2	From brown to yellow with spots. Gray.	Dull white or creamy to bright yellow with brown spots. Gray.
			Absolutely not resilient and loose on the blunder, immature and dead fibers form shiny plastic, covering a considerable part of the raw material.	

Depending on the contamination and humidity, raw cotton varieties are divided into classes: 1 (manual), 2 (machine) and 3 (selection) in accordance with the standards given in Table. 11.3.

Table 11.3

Cotton variety	Norms of mass fraction of weed impurities and mass ratio of moisture,%, not more than					
	1 class		2 class		3 class	
	mass fraction of impurities	mass ratio of moisture	mass fraction of impurities	mass ratio of moisture	mass fraction of impurities	mass ratio of moisture
I	3.0	9.0	10.0	2.0	16.0	14.0
II	5.0	10.0	10.0	3.0	16.0	16.0
III	8.0	11.0	12.0	5.0	18.0	18.0
IV	12.0	13.0	16.0	7.0	20.0	20.0
V	-	-	-	-	22.0	22.0

To control compliance with the above requirements, the national standards O'zDst 643, O'zDst 592, O'zDst 644, O'zDst 593 regulate the test methods.

The state standard of Uzbekistan O'zDst 643 - regulates the rules and methods for sampling raw cotton when it is received at harvesting sites and is completed in batches, to assess the quality of raw cotton stored in the stacks, when it is shipped from the procurement stations and when it is received at the cotton plant, and also for the control of the work of the drying-cleaning and purifying shops. Taking into account O'zDst, 592 and O'zDst 644 determine the conditional mass for the delivery of raw cotton, provided by O'zDst 615.

The state standard of Uzbekistan O'zDst 592- regulates the methods of determining the contamination of raw cotton. The instrumental base of the measurement methods consists of: 2L-12, LKM devices, laboratory scales with the largest weighing limit of 1000 g, laboratory dryers CXJI-3, YCC-1, drying cabinet with natural or forced ventilation and thermoregulator, desiccator with calcium chloride, , with an average temperature of the heating surfaces in the center of the drying chamber $195 (\pm 2) ^\circ \text{C}$. O'zDst 592 is attributed to weed impurities according to the national standard:

- mineral impurities (stones, lumps of earth, sand, dust),
- organic impurities (leaf particles, flower bracts, casement flaps, stem, and dried, rotten and brittle segments of raw cotton, the fiber of which lacks strength). The share of raw cotton affected by gummosis is determined by manual selection. The contamination of raw cotton is defined as the percentage of weights of contaminants to the sample weight.

The amount of raw cotton affected by gummosis is defined as the percentage of the mass of raw cotton affected by gummosis to the weight of the sample.

The state standard of Uzbekistan O'zDst 644 - describes the methods for determining moisture at the USH-1, VSKh-1 or VSH-M1 units, complete with bugs for accelerated determination of humidity in ovens of Uz-7m type with natural ventilation or forced- or on the Uz-8 installation with a thermostat. Humidity in these installations is defined as the percentage of the mass of moisture in the sample relative to the weight of the sample.

The state standard of Uzbekistan O'zDst 593- establishes the accelerated methods for determining the following characteristics of the quality of cotton fiber: color and

appearance, specific tensile load, maturity factor and linear density. The color and appearance of cotton fiber in raw cotton is determined by comparing the unified sample with the samples of appearance, approved in the established order.

To determine the maturity and specific breaking load of cotton fiber, use:

- equipment and instruments LPS-4, ASH-1 and ALS-1;
- laboratory dryer CHL-3;
- a device for cleaning raw cotton from weedy impurities LKM or LKM-2;
- gin-fiber cleaner PPV or laboratory gin DL-10 complete with a cotton analyzer (when testing samples of cotton fiber);
- Laboratory scales VLKT-500

The results of measurements of parallel determinations (in one laboratory, one sample) should not exceed the following values:

- for raw cotton, for ASH-1-5.0%, for ALS-1-4.0%, for cotton fiber for LPS-4, ASX-1 and ALS-1-2.5%. If the discrepancy between the parallel definitions exceeds the specified values, then additional samples are measured on LPS-4 - two, on the ASX-1 and ALS-1 - one.

Based on the calculated value and the tables approved in the established order, taking into account the selection variety of raw cotton, the maturity factor, the specific tensile load and the linear density are determined.

11.3. Standards for cotton fiber



Fig. 12.1 Modern methods of measure quality of fiber

The state standard of Uzbekistan O'zDst 604-2016 is designed for the classification of cotton fiber, supplied as raw material to textile enterprises, including e-sports. In this standard, the basic nomenclature of the quality index of cotton fiber is:

- staple mass length, mm;
- linear density, mtex;
- specific breaking load, sn / tex or gs / tex;
- maturity factor;
- appearance in color and quality of ginning;
- mass fraction of defects and weed impurities,%;
- mass ratio of moisture, %.

When delivering cotton fiber for export, in place of the above indicators, two types of indicators are used:

1. Classification of fiber quality by international standards and the indicator of micronaire:
 - variety according to color and weediness, quality of ginning;
 - staple length 1/32 inch;
 - the indicator of a micronaire.
2. Instrumental evaluation of fiber quality using measuring systems of type H VI :
 - variety according to color and weediness, quality of ginning;
 - coefficient of reflection (Rd), % and degree of yellowness (+ b);
 - indicator of micronaire;
 - staple length of 1/32 inch or upper semi-middle length, mm (inches);
 - specific breaking load in the graduation of HVI of the calibration cotton, gs/tex (cN/tex);
 - contaminants with non-fibrous materials, code.

Depending on the basic nomenclature of indicators, cotton fiber is divided into 9 types in accordance with the standards indicated in Table. 11.1. In turn, each type of cotton fiber according to O'zDst 604-2016 is divided according to color and maturity factor into 5 varieties and variety of cotton fiber according to Table. 11.4 is determined by the worst indicator.

Table. 11.4

Industrial Variety	Fibre colour and appearance by fibre shade	
	1a, 1b, 1, 2, 3	4-7
I	White, or white with natural creamy shade or creamy depending on breeding variety or region of cotton cultivation. Lustrous, silky and dense by appearance.	White, or white with natural creamy shade.
II	From mat-white to creamy with shades and small yellow spots. Lustre, silkiness and density are lower than those of variety I.	From mat-white to creamy with light yellow spots.
III	From mat-white to creamy or yellow of uneven coloration with yellow spots. Greyish shade, almost lusterless.	From dull-white to creamy with yellowish spots with mat-greyish shade.
IV	Yellow or light yellow of uneven colouration with grey shade and brown spots. Lustreless.	From dull white and cream-coloured to yellow-creamy with grey shade and brown spots.
V	From brown to yellow with spots. Grey.	Dull-white or dull-creamy to bright yellow with brown spots. Grey.

According to the content of defects and weed impurities, cotton fiber is divided into classes: higher, good, average, normal, weedy in accordance with the standards specified in table 11.5.

Table 11. 5

Industrial variety	Norms of contamination,%, not more than				
	higher	good	average	normal	weedy
I	2.0	2.5	3.0	4.0	5.5
II	2.5	3.5	4,5	5.5	7.0
III	3.0	4.0	5.5	7.5	10.0
IV	4,5	6.0	8.5	10.5	14.0
V	6.5	8.5	10.5	12.5	16.0

The standard does not allow the presence of whole cotton seeds in the fiber, foreign objects and putrefactive odor. The above quality indicators are used to form the price of cotton fiber for sale. So, if the cotton fiber of varieties 1 and 2 with specific tensile load is less than the established norm, then a discount is made from the base price, and if the base rate is exceeded, the price is capped to the price in the established order. Similarly, cloaks and discounts to the price are produced taking into account other quality indicators.

To assess the quality of exported cotton fiber, the O'zDst 604-2016 standard recommends its classification according to international standards. According to this classification, the cotton fiber is subdivided into groups of lengths with an interval of 1/32 inch in the range of 13/16 to 1-3 / 4 inches. When trading for the base length take 1 - 1/16 inch of Upland cotton fiber, which corresponds to 32 mm (5 type) according to O'zDst 604-2016. In this case, if the length of the fiber to be sold is greater than the base, then the cape is made to the price and vice versa, if less than the base, then discount from the price, which also depends on the fiber type.

The length and variety of fiber is determined by two methods: classroom and instrumental. The staple mass-length method is determined by comparison with standard samples (standards) of lengths, and in order to establish a variety, by comparing the appearance of samples with universal (international) standard US samples. The amount of weediness, which is also taken into account when assigning a value to the export fiber, is determined by comparing the sample with standard samples.

In the instrumental determination of cotton fiber values according to the O'zDst 604-2016 international classification, the HVI measuring system is recommended. Here, the cotton fiber variety is determined through the reflectance index (Ka1) and the degree of yellowness (+ b) using a special color chart.

The index of micronaire, which characterizes tonicity and maturity, is determined by the instrumental method for HVI by the difference in pressure of the air flow passed through the fiber of the determined mass. To translate the indicator of micronaire into linear density, O'zDst 604-2016 offers an approximate coefficient of 39.37.

The specific tensile load is also determined by the instrumental method on Presley instruments, a stelloimeter and the HVI measuring system.

When establishing prices for cotton fiber, the basic tensile load is considered to be 23.5-25.4 gauss / tex. If the strength is higher or lower than the basic interval, a corresponding cape or a discount to the price for each 1 gauss / tex is made.

The basic nomenclature of quality regulated by the standard O'zDst 604-2016 is determined by testing cotton fiber according to the methods regulated by the republican

standards O'zDst 614, O'zDst 618, O'zDst 619, O'zDst 620, O'zDst 629, O 'zDst 632, O'zDst 633, O'zDst 634.

- **The state standard of Uzbekistan O'zDst 618**- establishes methods for determining the maturity factor by two methods:

- in polarized light;
- by air permeability of samples.

The first method is used for calibration work and certification of standard samples, arbitration tests.

The second method is used for delivery and acceptance of cotton fiber. In the method of determination of maturity in polarized light, a microscope is used with magnification of 80-120 times, a set of glasses measuring 25x26 mm or 13x26 mm, a device polarizing to a microscope, a scale VT-200, a clamp 1 and a board for unfolding a hair , clamps for fastening of pairs of glasses.

For the method of determining the maturity for the air permeability of the samples, the following are used: LPS-4 device, laboratory scales 4 classes up to 1 kg with the price of division no more than 10 grams, a cotton analyzer of the type AX and FM-30 or other type of a similar type.

The degree of maturity of the fiber in polarized light is determined on its wide sections by the lowest interference color. In color, cotton fibers are divided into 4 groups according to Table. 11 .6.

Tabbytsa 11. 6

Group maturity	Degree of maturity cotton fibers	Coloring of cotton fibers	The shape of the cotton cane and its canal
I	Mature	Orange and golden yellow with pink and purple areas, as well as greenish-yellow with green and blue and mi areas	Cylindrical shape of fiber, narrow channel
II	Unripe	Blue and blue, yellow and Green with blue and blue patches	Tape shape of fiber, wide
III	Immature	Purple and blue with purple patches	Also
IV	Absolutely unripe	Purple with a transparent-red areas, transparent red	Also

The maturity of the cotton fiber is determined according to the O'zDst 618 method, using the data in Table 1. 11 .6. In determining the maturity of the air permeability of the samples, fiber samples are alternately mixed into the LPS-4 working chamber and a predetermined amount of air is supplied to the device. According to the approved tables, depending on the selection variety of cotton, the maturity of the fiber is set.

State Standard Uzbekistan O'zDst 619 - establishes methods of definiteness specific breaking load flat fiber bundles to dynamometers and the method of determining the specific tensile load on the air permeability of the samples.

By the specific tensile load is meant the value equal to the ratio of the greatest load preceding the destruction of the fiber to its linear density. The method for determining the specific tensile load by air permeability of samples is accelerated and is used for delivery and acceptance of cotton fibers. The method for determining the breaking load of plane beams is arbitral and is used for calibration work and for the attestation of standard samples.

The main means of measurement used in the methods of breaking flat beams of fiber on dynamometers are: dynamometers of the type DSh-3 or DSh-3M-2, having clamps with corrugated jaws or a Presley clamp, a mechanical stapler LNA-1 complete with a mechanical fiber spreader a glass of MRV-1 or a board covered with velvet.

The method for determining the specific breaking load according to the air permeability of the samples is based on the LPS-4 device, the weight of the 4th class with a weighing limit of up to 1 kg, and the cotton analyzer type AX or FM-30.

To check the instruments and all methods, standard samples approved by Uzgosstandard are used. When using the method of breaking flat fiber bundles on dynamometers with Presley clamps or corrugated jaws, a staple from the final ribbon, prepared according to O'zDst620, is prevented from pressing into the Presley clamp, cutting off the ends of the fibers protruding from the clamp. After the rupture, the block is removed from the clip holder, then in a vice, the fibers are released from the clamp with a wrench and tweezed in turn by the tweezers, both halves of the broken fibers, and then they are weighed.

The specific breaking load of a cotton fiber is determined from the ratio of the sum of the tensile load of the staples to the total mass of the cut out middle part of all the staples participating in the section.

Specific tensile loading by air permeability of the samples is determined according to the tables according to the order of O'zDst 620.

The state standard of Uzbekistan O'zDst 620 - establishes the following methods for determining the linear density:

- Gravimetric;
- By air-permeability of samples;
- By the indicator of micron.

Gravimetric method is designed to determine the linear density for calibration work, certification of standard samples and arbitration tests.

When supplying and receiving cotton fiber, methods are used to determine the air permeability of the samples.

Linear density of cotton is a value equal to the ratio of the fiber weight to its length.

The linear density according to the air permeability of the samples is determined by the tables and the procedure given in O'zDst 618.

The state standard of Uzbekistan O'zDst 629 - establishes methods for determining the color and appearance of cotton fiber. In accordance with this standard, the determination of the color and appearance of the cotton fiber is made by

comparing the tested sample with the approved samples of the appearance with an artificial (arbitration method) or natural lighting.

The state standard of Uzbekistan O'zDst 632 - establishes a method for determining defects and contaminants (contamination) by two methods:

- On cotton analyzers AX and FM-30;
- Manual analysis (arbitration).

Defects of cotton fibers are called different types of defects in the fiber, which impair its spinning properties. These include: burning tics, combined flagella, plastics immature fibers, peel of seeds with fiber, immature seeds (Mossy cotton), crushed seeds with fiber, nodules. Contaminants are a mineral and organic non-fibrous waste.

In the process of determining the contamination with a cotton analyzer, the sample taken from the combined test sample is spread evenly on the feeding table of the cotton analyzer and the sample is fed into the analyzer. After the end of the pass of the entire sample, the cotton analyzer is stopped. Then, from the carbon monoxide chamber and from the air filter of the cotton analyzer, the defects and contaminants are chosen and weighed together, setting their total mass. At the same time, weakness is determined from the percentage of the allocated mass of defects and weights at the mass to the mass of the sample before the tests, taking into account the individual coefficient of the cotton analyzer (installed according to a standard sample).

Terms and definitions that explain the physical nature of rock and weed are given in Table. 11.6.

Table 11.6

The terms	Definitions
1	2
Twists	Tightly twisted and tangled bunches of fibers of various shapes and sizes that could not be separated by hands without breaking.
Combined twists	Groups of several (not less than two) tangled flagella.
Plastics of immature cotton fibre	An accumulation of immature fibers. Plastics are shiny, less matte, white, light yellow and yellow, with low strength compared to the strength of the base fiber.
Mossy cotton	Different in size undeveloped seeds covered with immature fiber of different colors.
Crushed seeds	Large particles of seed peel (more 2 mm) with the fibers remaining on them.
Peel of seeds with fiber	Particle of seed peel (up to 2 mm) with the fiber remaining on it.
Neps	Fused in the form of a nodule, the fiber has a length of about 0.05 mt.
Organic and inorganic impurities	Particles of leaves, bracts, stalks, cotton boxes , twine particles, straws, dust, sand, etc.

Determination of the content of vices and contaminants by manual analysis is carried out by isolating impurities from a sample placed on a sheet of polished plywood or cardboard, a three-pronged pin. The mass fraction of each type of defects is then calculated from the quotient of the mass of the isolated species of defects and weed as a result of the analysis of samples to the mass of the sample before the tests.

State Standard of Uzbekistan O'zDst 633 - establishes methods for determining the staple mass length and the content of short fibers mechanically on MPRSh-1 devices and manual sorting on the Zhukov device (arbitration), as well as the classifying method of determining the length. Staple mass is called the average mass length of fibers, the length of which is more modal.

By modal mass-length is meant the average length of fibers with the largest mass.

A short fiber is a fiber of less than 16 mm in length for medium-fiber varieties and less than 20 mm for long-fiber cotton varieties.

The methods for determining the staple mass length and the content of short fibers are based on measuring the mass of a group of fibers sorted along the length with an interval of 2 mm, followed by calculation of the length characteristics.

Determination of the staple mass length by the classifying method consists in preparing manually a staple of parallel fibers followed by matching the staple with staples prepared by the same operator from standard fiber samples with known staple lengths.

The means of measuring staple mass of length and content of short fibers include:

- mechanical stapler MShU-1 complete with mechanical sorting of fibers MPRSH-1 (mechanical method) or Zhukov's device complete with two clamps 1,2 and a board covered with velvet, with an emphasis for clamps (manual method);
- tweezers;
- torsion balance VT-20;
- standard samples of cotton to control methods of length determination, approved by Uzstandart.

The staple mass length is calculated by the method described in the State Standard of Uzbekistan O'zDst 633.

The State Standard of Uzbekistan O'zDst 634 - establishes methods for determining moisture with the use of drying cabinets, apparatus and sensing installations. The method of measurement is based on the drying of samples at a constant temperature in drying cabinets of the type Uz-7M, Uz-8, drying apparatuses such as AST, AST-73, measuring devices such as USH-1, VHS, VHS-M1. The mass ratio of moisture (W) in percent is calculated from the percentage of the mass of moisture in the sample to the weight of the sample of cotton fiber after drying.

11.4. The Standard for cotton lint

The state standard of Uzbekistan O'zDst 645 - regulates the requirements for a cotton lint, obtained by seeding the seeds at a cotton plant. According to the specified standard, cotton lint is subdivided in length into two types:

- type A from 7-8 mm and more;
- type B from 6 -7 mm or less.

In addition, each type in appearance and maturity is divided into two classes - I and II. Classification of the variety is carried out according to approved samples of appearance and normalized indicators of maturity, given in Table 11.7

Table 11.7

Variety of lint	Maturity, %, not less than	
	defined by the microchemical method	defined in polarized light
I	80 less	55 less
II	than 80	than 55

In turn, each type and variety of content in the lint of the mass fraction of weed is divided into three classes: higher (1), medium (2), weasel (3) in accordance with the standards specified in Table 11.8.

Table 11.8

Type	Variety	Mass fraction of contaminants and whole seeds by classes, %, not more than		
		the highest (I)	medium (2)	weedly (3)
A	I	4.5	6.0	8.5
	II	8.0	11.0	15.0
B	I	4.5	6.0	8.5
	II	8.0	11.0	15.0

The standard does not allow foreign objects, burnt and rotten odors, putrefactive surfaces and dense layers in the cotton lint.

Cotton lint batches are taken according to the conditioning weight, reduced to normalized humidity according to the standard

The lint tests are carried out for O'zDst 657 , O'zDst 662 .

Samples for testing from unrestored and bale-free lint are selected according to O'zDst 657.

The state standard of Uzbekistan O'zDst 658 - establishes methods for determining the color and appearance of cotton lint on the basis of the comparison of the test sample with approved samples of appearance under artificial (arbitration method) or natural lighting in a special room (classroom room). At the same time, the operator places the test sample on the classification table, next to the approved samples of appearance, and finds the closest sample of the lint with a visual comparison. The operator makes the comparison both on the external and internal surfaces of the test sample. For the result of the evaluation, they take the worst option.

The state standard of Uzbekistan O'zDst 659 - regulates the methods of determining the mass ratio of moisture using drying cabinets Uz-7M or ShKS-1, SHHS and measuring devices USH-1, VHS-1 or VHS-M1.

During the tests, the prepared sample is uniformly spread out in the drying zone of the ready-to-use unit, close the lid tightly and dry the sample for three minutes. Then the lid at the chamber is opened and the sample is taken out of the unit with

contaminants, closed in a box and immediately weighed. An empty bag with a lid is weighed separately.

The mass ratio of moisture is calculated as a percentage of the mass of moisture in the sample to the weight of the dried sample.

The tolerable discrepancy between the results of parallel samples at a humidity of 16%, as well as results obtained in different laboratories or between two tests in one laboratory, should not exceed + 0.5 abs. %.

The state standard of Uzbekistan O'zDst 660 - establishes a method for determining the staple length of lint (the length of the main mass of lint fibers in a staple with aligned edges). This method is based on a linear measurement of the lint length on a hand-prepared parallel-fiber staple, laid on a black velvet-covered board.

The state standard of Uzbekistan O'zDst 661 - regulates the definition of cotton linter maturity by two methods:

- microchemical;
- in polarized light (arbitration).

The microchemical method is based on the dependence of the geometric shape and color of the fibers on their maturity after treatment with an 18% sodium hydroxide solution and a dye. The method for determining maturity in polarized light is based on the application of the interference color of fibers in polarized light from their thickness and internal structure.

In a microchemical method, the sample washed after chemical treatment is placed between the slides (upper and lower), which after the clamp is placed on the microscope stage and classified after being viewed under microscopy into two groups - mature and immature, according to Table. 11.9

Table 11.9

Maturity group	Appearance of lint fibers
Mature	Fibers of cylindrical shape without deformations bright red burgundy color, depending on the dye used
Immature	The fibers are ribbon-like with twists of bright red or bright burgundy color, depending on the dye used or flat, painted in a weakly pink color or colorless.

In the method of determining the maturity in polarized light, the layers of glass that are spread on the slide parallel to a rare layer (splitting the fibers with needles) scan them through a microscope in a polarizing device. According to the interference color and the shape of the fibers, the maturity of the lint is determined according to Table. 11.10.

Table 11.10

Maturity group	Staining of lint fibers	Fiber and channel shape
Mature	Orange with pinkish purple patches, golden yellow with green patches, salad color (greenish yellow, yellow with blue areas	Narrow channel
Immature and perfectly unripe	Yellow with blue areas, blue with blue patches, blue, blue with purple patches, purple with transparent-red patches	Tape- shaped fiber, broad channel

The maturity determined by any of the methods described is determined by the percentage of the total number of mature fibers on all slides to the total number of fibers on all slides.

The state standard of Uzbekistan O'zDst 662 - establishes methods for determining the mass fraction of contaminants (weediness) and semih seeds. Two methods for determining lint weed are regulated:

- weighing on scales (weighting method),
- centrifugation of sulfuric acid solution of lint (method of trophyting prices).

The mass fraction (content) of whole seeds is determined by manual method, manually isolating entire seeds from the sample of the cotton fiber.

The weight method of determining the contamination consists in determining the mass fraction of the contaminants remaining after dissolving with sulfuric acid and removing the fibrous composition of the lin.

The determination of lint contamination by the centrifugation method consists in separating the impurities from the sulfur- impregnated pulp.

The processing of the measurement results is carried out according to O'zDst 662.

11.5. Standards for cotton seeds

The state standard of Uzbekistan O'zDst 596 - regulates the technical conditions for cotton seed technical, which are prepared for industrial processing at oil and fat companies. Depending on the mass fraction of defective seeds, cotton seeds are divided into four industrial varieties: I, II, III, IV.

Seeds of cotton should meet the technical requirements given in Table. 11.11., 11.12.

Table 11.11

Seed variety	Defect seeds,% no more	Moisture, % no more	Spoiliness,% (basic)	
			Medium-fiber cotton varieties	Long-fiber cotton varieties
I	1.5	10	5.0-10.5	2.0-6.5
II	3.0	eleven	6.0-10.5	3.0-7.5
III	11.0	12	7.0-11.0	4.0-8.5
IV	33.0	13	8.0-13.0	4,5-9,0

Table 11.12

Seed variety	Color of the kernel of cotton seeds in a section
I	Light cream with greenish and other shades, depending on the selection variety.
II	Cream with shades depending on the selection variety of cotton.
III	About t grayish-cream to yellow with shades.
IV	From yellow to light brown

The seeds are taken in batches according to the conditioning weight (Mk), reduced to the calculated moisture and weed rates according to O'zDst 596.

Sampling of seed for testing is carried out according to O'zDst 598.

The state standard of Uzbekistan O'zDst 597- establishes a method for determining defective seeds in the range of values 0-33%. The cotton seeds with the black color of the core (burnt), damaged seeds, having less than half the core, are considered defective.

The method for determining defective seeds consists in isolating poor quality seeds according to the color of their kernels and damage.

The republican standard O'zDst 599 - regulates the method of determining the contamination of seeds with mineral and organic rubbish in the range of values from 0 to 10%. Mineral and organic sora include: a mineral admixture (earth, sand, dust, etc.), an organic impurity (particles of leaves, stems, capsules, seed husks without kernels).

The method of determination consists in isolating impurities through a sieve.

The state standard of Uzbekistan O'zDst 600 - regulates the methods for determining moisture with the use of drying cabinets in the range of values of 0-50% and thermostabilizers in the range of 0-15%.

The method is based on the principle of drying samples at a constant temperature.

Humidity in these devices is defined as the percentage of the mass of moisture in the sample to the mass of the test sample before drying.

The state standard of Uzbekistan O'zDst 601 - establishes the methods for determining the pubescence in the OSX-1 opener (arbitration) and using vessels from enriched porous clay in the range of 0-15%.

The method is based on separating the pulp from the seeds with hydrochloric acid vapor and then determining the amount of filament removed from the change in the mass of the seeds. The fluffiness is defined as the percentage of the weight of the pod to the mass of the test sample.

STANDARDS

1. O'zDst 643- "Raw Cotton. Methods of sampling".
2. O'zDst 592- "Raw Cotton. Methods of determination of contamination".
3. O'zDst 593- "Raw Cotton. Methods for determining the characteristics of cotton fiber.
4. O'zDst 644- "Raw Cotton. Methods for determination of moisture".
5. O'zDst 604- "Cotton fiber. Technical conditions".
6. O'zDst 614- "Cotton fiber. Methods of sampling.
7. O'zDst 618- "Cotton fiber. Methods for determining maturity".
8. O'zDst 619- "Cotton fiber. Methods for determining the specific tensile load".
9. O'zDst 620- "Cotton fiber. Methods for determining the linear density and the index of a micronaire".
10. O'zDst 629- "Cotton fiber. Methods for determining the color and appearance".
11. O'zDst 632- "Cotton fiber. Methods for determining the content of defects of cotton fibre and weed".
12. O'zDst 633- "Cotton fiber. Methods for determining the length"

- 13.O'zDst 634- "Cotton fiber. Methods for determining the mass ratio of moisture".
- 14.O'zDst 645- "Cotton lint. Technical conditions".
- 15.O'zDst 657- "Cotton lint. Methods of sampling".
- 16.O'zDst 658- "Cotton lint. Methods for determining color and appearance".
- 17.O'zDst 659- "Cotton lint. Methods for determining the mass ratio of moisture".
- 18.O'zDst 660- " Cotton lint. Methods for determining the length".
- 19.O'zDst 661- " Cotton lint. Methods for determining maturity".
- 20.O'zDst 662- " Cotton lint. Methods for determining the mass fraction of contaminants and whole seeds".
- 21.O'zDst 596- "Cotton seeds are technical. Technical conditions".
- 22.O'zDst 598- "Cotton seeds are technical. Methods of sampling and allocation of samples".
- 23.O'zDst 597- "Cotton seeds are technical. Methods for the determination of defective seeds".
- 24.O'zDst 599- "Cotton seeds are technical. Methods for the determination of mineral and organic sors.
- 25.O'zDst 600- "Cotton seeds are technical. Methods for determining the mass fraction of moisture".
- 26.O'zDst 601- "Cotton seeds are technical. Methods for determining pubescence".

Control questions:

1. What is the certification of cotton for?
2. How many types, varieties and classes are classified as raw cotton?
3. List the range of basic indicators of cotton fiber quality . AT which standard are they listed?
4. What kinds of contaminants are divided into and how to determine the weediness raw cotton?
5. How to determine the amount of raw cotton affected by gomme ?
6. What instruments determine the moisture content of cotton fiber?
7. How to set the moisture content of raw cotton?
8. On what devices and by what standard do they determine the maturity factor and linear density of cotton fiber?
9. On which indicators of international certification do the quality cotton fiber?
10. What methods determine the staple mass-length?

Chapter XII

MECHANIZATION OF COTTON WORK OF COTTON PLANTS

12.1. Equipment for transportation of raw cotton, fibers, seeds and bales

The procurement of raw cotton, its storage, the continuous technological process, the movement of raw materials and finished products in the shops and on the territory of the cotton plant are carried out using a large number of various vehicles, special devices and installations that mechanize labor-intensive and heavy work.

A continuous technological process with powerful cargo flows (12-15 t / h of raw cotton, seeds, cotton fiber) is a characteristic feature of cotton ginning plants.

Means of mechanization of labor-intensive and heavy work are divided into two groups:

- means ensuring a continuous technological process in the preparatory, main and auxiliary shops: the supply of raw cotton for processing, the transfer of seeds, cotton fiber, lint from one stage of the technological process to another, the distribution and removal of raw materials and products from technological machines;

- funds associated with the supply of raw materials to procurement centers, its placement in storage facilities and on riot sites, the transfer of bale fiber and lint, as well as seeds to loading areas, loading of products into railway wagons and other types of transport, funds associated with reliable long-term storage of raw materials and finished products.

In general, work on mechanization of labor-intensive operations is carried out by transport devices of various types. They are divided into pneumatic, mechanical (belt elevators, horizontal and inclined, screw conveyors) and autotractor transport, ensuring the delivery of remeschetria from collective farm fields to harvesting stations and its inside territory.

12.2. Means of mechanical transport

The Cotton Handler is designed to accept raw cotton transported without tare and feed it to subsequent vehicles that ensure the loading of cotton into riots or warehouses of procurement stations and cotton ginning plants. The cotton transporter has two versions: XPP-1 for riot areas; XPP-2 - for warehouses (Fig.12.1).

The mobile cotton transporter is operated in conjunction with the belt conveyor KLP-650 or the TXL-18 conveyor.



Fig. 12.1. Cotton Handler

Technical characteristics of the cotton transshipper

Table 12.1

Productivity, t / h	30
The time of unloading a motor vehicle with two trailers, minutes	15-18
Length, mm	8700-9200
Height, mm	3020-4020
Weight, kg	3620-3860
Installed power, kW	5.5

The belt conveyor KLP-650 is designed for supplying raw cotton to riot areas for the purpose of forming riots or filling the covered storage facilities for bulk transportation (Fig.12.2).

Conveyors are operated in conjunction with the receiving and feeding devices, which are simultaneously metering devices that provide the necessary productivity. Works in factories and outside the factory procurement centers.



Fig.12.2. The belt conveyor KLP-650

Technical characteristics of belt conveyor KLP-650

Table 12.2.

Productivity, t / h	38
Transport height, m	5-12.5
Length of transportation, m	18.5
Installed power, kW	9.7
Weight, kg	3200

The disassembler-feeder RP-is intended for supplying raw cotton to the pipeline of yard pneumatic transport of cotton- **growing plants** from operative warehouses and open areas. It is a self-propelled rotary maneuvering vehicle with outgoing and unloading vehicles, as well as a mobile horizontal transport connected

to the suction port of the pneumatic transport system. During transportation, the feeder is controlled by the steering wheel. The feeder is controlled by one person from an external push-button unit, which creates convenience and safety for the operator. The feeder disassembler provides high-performance operation of cotton-growing plants and drying-cleaning shops (Fig.12.3)



Fig.12.3. Disassembler feeder RP

The technical characteristics of the disassembler -feeder RP

Table 12.3.

Productivity t / h	12-18
Height of the milling cutter from the floor, mm	8,000
Band width, mm	500
Weight, kg	630

Cotton conveyor TLH-600B . It is intended for transposing raw cotton at an angle to the horizon from 15 to 45°. (Fig.12.4)

The conveyor is assembled from unified links and can have different lengths from 6000 to 16000 mm every 1000 mm.

The driving drum is driven from the engine via a V-belt drive and a hinged single-stage gearbox. On the surface of credit pyatsya rubber blade by means of bolts with spherical Shai Bami. Mounting of the conveyor is made by the connection between at bout tension, drive station and the required number of links, in dependence on the length of the conveyor. The tape prior to insertion in the conveyor recommended subjected to preliminary drawing force of 600 kgf in 36 hours.

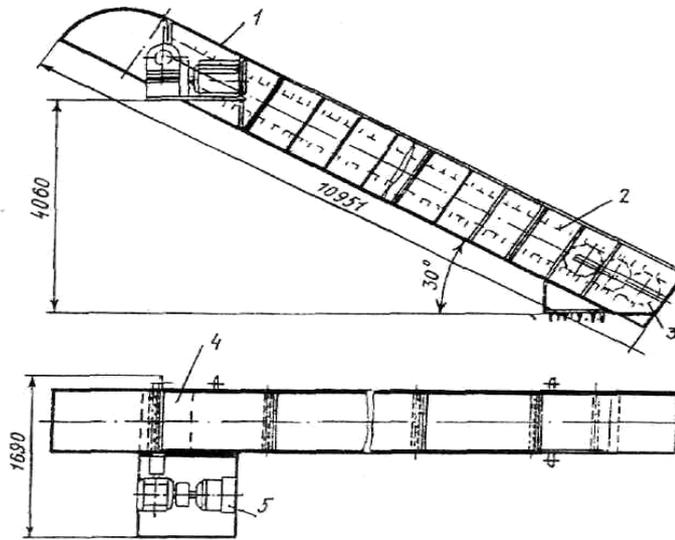


Fig. 12.4. Cotton conveyor TLH-600B
 1 - housing; 2 - a scraping tape; 3 - driven drum;
 4 - driving drum, 5 - drive station

Technical characteristics of the conveyor TLH-600B

Table 12.4

Capacity at $\alpha = 45^\circ$, t / h	12
Installed power, kW	4.0
Rotational speed of the drive drum, rpm	160
Band width, mm	600
Overall dimensions, mm:	
length: smallest	7460
greatest	17460
width	1040
height	1290
Weight, kg, smallest	756

Conveyor (transporter) cotton prefabricated 8TXSB is designed for transportation of raw cotton at an angle of no more than 15° to the horizon. The conveyor is assembled from unified links and can have different lengths from 4000 to 36000 mm, every 1000 mm.

The driving drum is driven from the engine via a V-belt drive and a hinged single-stage gearbox.

The conveyor is used for internal transport for the removal of cotton, mainly from drying machines.

Conveyor belts with blades (scraper) are used in all cases where transportation of cotton and its products about plauged angle of $15-20^\circ$ above the horizon, depending on the performance and belt speed.

The order of installation and conveyor belt tension is similar to con Weier TCL 600B.

Technical characteristics of conveyor 8TXCB

Table 12.5.

Productivity, t / h, not more than	20
Installed power, kW	5,0 160
Rotational speed of the drive drum, rpm	
Band width, mm	550 + 5
Overall dimensions, mm	
length: smallest	5460
greatest	37460
width	1040
height	1080

The conveyor belt weft 8TJIC - is intended for transportation of contaminants from under feeders of sawed gin . It consists of a drive, tension station, individual links and a belt conveyor.

Technical characteristics of the conveyor 8TLS

Table 12.6.

Productivity in contaminants, t / h, not more than	2.5
Installed power, kW	1.1
Rotational speed of the drive drum, rpm	104
Width of belt, mm	150
Overall dimensions, mm (complete)	
length	18100
width	600
height	1600
Mass. Kg	325

12.3. Screw Conveyors (Screws)

Depending on the productivity and type of cargo being moved, different modifications of screw conveyors are used at the cotton factories.

The screw-type cotton SHX -Designed for hori zontally moving and distribution of raw cotton for mines Feeders: batteries and valichnyh saw gins, cotton cleaners and other machines (Fig.12.5). Composed of individual links with a total length of 32m.

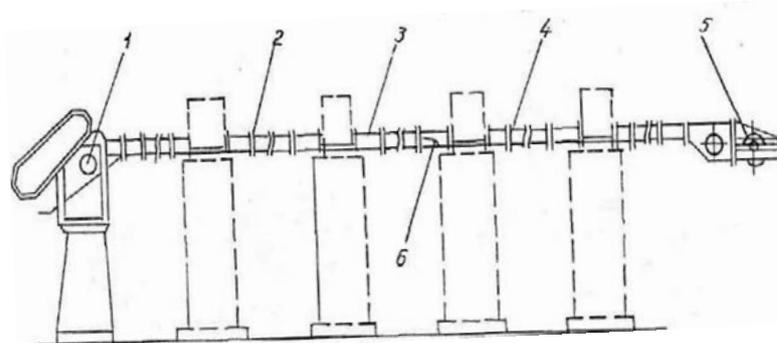


Fig.12.5. Conveyor belt weights 8TLS
1-drive station; 2,3,4-intermediates; 5-legged station; 6-belt.

Technical characteristics of ShH

Table 12.7.

Productivity, kg / h	20000
Diameter of the screw, mm	450
Screw pitch, mm	500
Diameter of pipe, mm	114
Speed of rotation, rpm	160
Distance between centers of supports, mm	3000,4000
Maximum screw length, m	32.0
Power consumption, kW	5.5
Weight 1 m auger, kg	126

Screw conveyor for distribution of raw cotton by cleaning machines of BP-2

Table 12.8.

Diameter of the screw, mm	400
Screw pitch, mm	455
Rotational speed, rpm	120
Conveyor drive	from the electric motor type AO-52-6, P = 4.5 kW, n = 960 rpm through reducer SHKhB-3

12.4. Elevators

Used for vertical transportation raw cotton and in some cases for transports waste.

Elevator cotton EH-15M - is designed for vertex transportation (lifting) of raw cotton (Fig. 12.6).

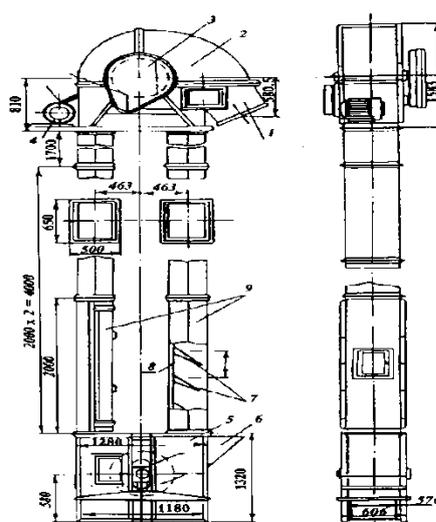


Fig.12.6. Cotton elevator EH-15M

- 1 - discharge opening; 2 - the head of the elevator; 3 - the leading drum;
- 4 - the electric motor; 5 - shoe; 6 - loading aperture; 7-bucket;
- 8 - belt with buckets; 9 - pipe with a hatch.

Elevator EHS - is designed for vertical transportation of raw cotton, seeds and contaminants at a height of 4620 mm to 14620 mm with an interval of 1000 mm. It is the latest modification of the mechanisms of a similar type. The elevator consists of a head, a shoe, a power station, a set of pipes, a ribbon with combs (when transporting cotton), or a bucket belt when transporting seeds or contaminants.

Technical Characteristics of the Elevator EH-15M

Table 12.9

Productivity, t / h (by cotton)	15
Drum length, mm	500
Diameter of the drum, mm	630
Rotational speed, rpm	55
Width, mm	500
Belt speed, m / s	1.8
Number of grab buckets per 1 linear meter of tape, pcs.	1.65
Pitch of bucket buckets, mm	600
Rotational speed of drive pulley, rpm	500
Installed power, kW	2.2
Dimensions, mm:	
Length , width , height	2457 x 950 x 4130-18130
Weight, kg	1020

Technical Characteristics of the Elevator ECH

Table 12.10.

Productivity, t / hour when loading along the belt: for raw cotton by seeds	20 35
when loaded against the travel of the belt: for raw cotton	12
on seeds	25
Installed power, kW	3.0
Rotational speed of the drive drum, rpm	112
Band width, mm	500
Overall dimensions, mm:	
length	1836
width	1557
height: lowest	5259
greatest	15259

12.5. Mechanization of loading and unloading and transport operations with cotton seeds

Technical seeds coming out of production, as a rule, are temporarily stored in cotton factories, with subsequent shipment to the dairy factories.

Transportation of seeds from the linter shops to warehousing locations is mainly carried out by a complex of stationary vehicles.

Temporary storage of seeds is carried out on open sites, with their sprinkling them into "cones" at the angle of natural oxygen, into warehouses of a rectangular type, or into mechanized storage tanks of bunker type.

The most common is the option "a", which provides storage of seeds in open areas. A number of cotton plants use a combination of the given varieties.

The most economical in terms of capital costs, is the option of seeding seeds on open areas, in cones. However, it is inevitable that the industrial varieties of seeds are mixed and moistened.

In both cases, this is due to the loss of seed quality due to their transition to reduced varieties, even with short-term storage. Therefore, despite the large capital costs, the most economical are the options for storing seeds in warehouses or mechanized bunker-type storage facilities.

Shipment of seeds after short-term storage and transportation to dairy plants is carried out by rail or road transport. Disassembly and loading of seeds into transport are made with the help of a mobile or stationary complex of machines.

Control questions

1. Equipment for transportation of raw cotton, fiber, seeds and bales;
2. What means of mechanical transport are used in cotton plants?
3. Technological characteristics of screw conveyors?
4. Elevators of raw cotton and seeds.
5. Mechanization of loading and unloading and transport operations with cotton seeds
6. The main working assemblies of the distributor-feeder RP.
7. Technical characteristics of the cotton transporter XPP.

Terms and definitions for the course
"Technology and equipment for the processing of cotton"
 "Paxtani dastlabki ishlash texnologiyasi va jihozlari"
 fanidan atama va ta'riflar

Термины и определения по курсу
 "Технология и оборудование первичной обработки хлопка"

Total meaning	Umumiy tushuncha	Общая понятия	Izoh
Cotton industry Cottonprocessing industry Cotton ginning industry	Paxta tozalash sanoati. Paxta sanoati	Хлопкоочистительная промышленность. Хлопковая промышленность	Paxtani qayta ishlaydigan tarmoq
Cotton ginning Cotton plant. Cotton mill	Paxta tozalash korxonasi. Paxta tozalash zavodi	Хлопкоочистительное предприятие. Хлопкозавод	Paxtani qayta ishlash bo'yicha sanoat korxonasi
Seed cotton procurement centre	Paxta tayyorlash punkti	Хлопкозаготовительный пункт	Paxta yetishtiruvchi xo'jaliklardan qabul qilib, uni jamlab, qaram va omborlarga joylab, quritib, tozalab paxta tozalash zavodiga jo'natishni amalga oshiruvchi paxta tozalash zavodining kichik bo'linmasi
Ginyard cotton procurement centre	Zavod hududidagi paxta tayyorlash maskani	Призаводской хлопкозаготовительный пункт. Призаводской заготхлопкопункт	Paxta tozalash zavodi hududida yoki unga yondashib joylashgan paxta tayyorlash maskani
Local procurement centre	Zavod xududidan tashqaridagi paxta tayyorlash maskani	Внезаводской хлопкозаготовительный пункт. Внезаводской заготхлопкопункт	Paxta tozalash zavodi hududidan bosh qa joyda joylashgan paxta tayyorlash maskani
Cotton processing. Seed cotton processing	Paxtani qayta ishlash	Переработка хлопка-сырца	Paxtadan paxta mahsulotlari ishlab chiqarish jarayonlar va operasialari majmuasi
Regulations technological process	Muvofiqlashtirilgan texnologik jarayon	Регламентированный технологический процесс	Me'yoriy hujjatlar bilan belgilan gan texnologik jarayon
Technological laboratory of cotton ginnery	Paxta tozalash zavodining texnologik laboratoriyasi	Технологическая лаборатория хлопкозавода	Paxta tozalash zavodining texnik nazorat bo'limi tarkibiga kiradigan va ishlab chiqarilayotgan paxta mahsulotlar sifatini, paxtani qayta ishlash texnologik jarayonini, paxta mahsulotini sifatli jamlash va jo'natish ustidan nazorat olib boradigan laboratoriya

Laboratory of procurement center	Paxta tayyorlash punkti laboratoriyasi	Лаборатория заготовкопункта	Paxta tozalash zavodining texnik na zorat bo'limi tarkibiga kiradigan va jamlanayotgan paxta sifati, uni jam lash, saqlash va paxta tozalash zavodiga jo'natish ustidan nazorat olib boradigan laboratoriya
Laboratory testing equipment	Laboratoriya asbob uskunalari	Лабораторное оборудование	Paxta tozalash zavodi va paxta tayyorlash punkti laboratoriyalarida paxta mahsuloti sifatini aniqlash va paxta tozalash asbobuskunalari ishini nazorat qilish uchun ishlatiladigan qurilma, asbob va mexanizmlar
Laboratory assessment. Laboratory certification. Laboratory standardization	Laboratoriyaning attestatsiyasi	Аттестация лабораторий	Laboratoriyalarni akkreditlash uchun belgilangan mezonlarga muvofiqligini aniqlash maqsadida sinov laboratoriyasini tekshirish (O'z Dst 5.5)
Test testing	Sinash	Испитание	Muayyan mahsulot yoki jarayon bir yoki bir necha tafsilotlarini belgilangan protseduraga muvofiq aniqlash dan iborat bo'lgan texnik operatsiyalar (O'z Dst 5.5)
Certification	Sertifikatlashtirish	Сертификация	Uchinchi tomonning mahsulot yoki jarayonning belgilangan talablarga muvofiqligini yozma shaklda tasdiqlash protsedurasi (O'z Dst 5.5)
Procedure control	Texnikaviy nazorat	Технический контрол	Obyektning belgilangan texnikaviy talablarga muvofiqligini nazorat qilish (O'z Dst 621)
Receipt control	Kirishdagi nazorat	Входной контрол	Tayyorlovchining iste'molchi yoki buyurtmachiga yuborilgan mahsulotining tayyorlash, ta'mirlash yoki foydalanishda ishlatishga yarokliligi bo'yicha ta'minotchi nazorati (O'z Dst 766)

Mean of control	Nazorat vositasi	Средство контроля	Nazorat o'tkazishi uchun qo'llaniladigan texnikaviy qurilma, ashyo yoki material (O'z Dst 621)
Metrological assurance	Metrologik ta'minot	Метрологическое обеспечение	O'lchashlar birligiga va talab etilgan aniqligiga erishish uchun zarur bo'lgan ilmiy va tashkiliy asoslarni, texnik vositalarni, qoidalar va meyorlarni belgilash va qo'llanish
Government calibration	O'lchash vositasini qiyoslash	Поверка средств измерений	Davlat metrologik xizmati (boshqa ma'sul organ, tashkilot) tomonidan o'lchov vositalarini asosiy texnik talablarga mos kelishini tekshirish va tasdiqlash bo'yicha bajariladigan operatsiyalar majmuasi.
Metering instruments	O'lchash vositasi	Средство измерений	O'lchashlar uchun qo'llaniladigan va meyorlangan metrologik xossalarga ega bo'lgan texnik vosita
Standard production	Standart mahsulot	Стандартная продукция	Xususiyatlari standart talablariga to'liq mos keladigan mahsulot (O'z Dst 1.10)
Cotton cleaning equipment Cotton ginning equipment	Paxta tozalash asbob uskunalari	Хлопкоочистительное оборудование	Paxtani qayta ishlash uchun mo'ljallangan asbob-uskunalar
Output Capacity	Unumdorlik	Производительность	Muayyan vaqt birligida asbob-uskunalardan o'tkaziladigan yoki ularga qayta ishlash uchun kelib tushadigan, paxta, shuningdek, ishlab chiqariladigan mahsulot miqdori (miqdori fizik yoki konditsion massada, yoki toylarda aniqlanishi mumkin)
Nominal output. Rated capacity	Unumdorlik (texnikaviy)	Производительность (техническая)	Buyumning meyoriy texnik hujjatlarda belgilangan va uning konstruksiyasiga bog'liq bo'lgan hisoblangan unumdorlik
Operational output. Real capacity Throughout capacity. Working capacity	Unumdorlik (foydalanish bo'yicha)	Производительность (эксплуатационная)	Haqiqiy ishlab chiqarish ma'lumot lari asosida rejalashtiriladigan ish unumi

Battery of machines	Mashinalar qatori	Батарея машин	Umumiy xomashyo bilan ta'minlash tizimiga ega bo'lib, parallel ishlaydigan bir turdagi bir nechta mashinalar majmuasi
Flow production line. Production line	Oqim liniyasi	Поточная линия	Texnologik jarayon yo'nalishi bo'yicha ketma-ket joylashtirilgan texnologik mashinalar (asbob uskunalar) majmuasi
Cotton plant (Gossipium)	G'o'za	Хлопчатник	Gulxayridoshlar oilasiga kiradigan o'simliklar avlodi
Mediumstaple cotton. Midstaple cotton . Shortstaple cotton. Upland cotton	O'rta tolali g'o'za	Средневолокнистый хлопчатник	Tolasining uzunligi 25-35 mm bo'lgan g'o'za
ELG cottonextra long stapled cotton.Fine stapled cotton. Long stapled cotton	Uzun tolali g'o'za	Длинноволокнистый хлопчатник	Tolasining uzunligi 36-42 mm bo'lgan g'o'za
Breeding variety Selection cotton variety	G'o'zaning seleksiya navi	Селекционный сорт хлопчатника	Muayyan morfologik va agrotexnik alomatlarga ega bo'lgan va ilmiy tadqiqot muassasalarida ilmiy seleksiya uslublari asosida yetishtirilgan g'o'za navi
Cotton material. Cotton	Paxtali material. Paxta	Хлопковый материал. Хлопок	Paxta, paxta tolasi, momiq, chigit va tarkibida o'lik aralashgan chiqindilar va paxtaning kalta momig'i aralashgan chiqindilar
Seed material	Uruqlik material	Семенной материал	Urug'lik chigit va urug'lik paxta
Seed cotton	Paxta	Хлопок-сырец	Tolalar bilan qoplangan chigit
Cotton lock Lobe	Pallacha	Долка	G'o'za ko'sagining chanoq pallalarining har biridagi paxta
Flying	Tolali chigit	Летучка	Sirtida tolalari bo'lgan alohida chigit
Seeded cotton	Urug'lik paxta	Хлопок- сырец семенной	Urug'lik chigit olish uchun mo'ljallanib ekilgan maydonlardan terilgan paxta
Handpicked cotton	Qo'lda terilgan paxta	Хлопок- сырец ручного сбора	Ochilgan ko'saklardan qo'lda terib olingan paxta
Machinepicked cotton	Mashinada terilgan paxta	Хлопок- сырец машинного сбора	Paxta terish mashinalarida g'o'zaning to'la ochilgan ko'saklaridan terib olingan paxta

Curak. Shortstapled cotton in bolls. Slightly immatured shortstaple cotton in unopened bolls. Stripped cotton	Ko'rak	Курак	Pishib yetilmagan, sovuqdan biroz ochilgan paxta ko'sagi
Machine stripped seyed cotton in bolls	Ko'rakdan olingan paxta	Хлопок- сырец курачного сбора	Paxta ekuvchi xo'jaliklardan qo'lda yoki ko'rak terish mashinalarida terilgan ko'rakdan ko'rak chuvish mashinalarida chiqarilgan paxta
Seed cotton gleaning	Yerdan terib olingan paxta	Подбор хлопка- сырца	Terimda to'kilgan, qo'lda yoki mexanizmlarda yordamida yerdan terib olingan paxta
Immature seyed cotton	Pishmagan paxta	Незрелый хлопок- сырец	Tolada hujayralar o'sishi erta to'xtashi oqibatida unda egiluvchanlik va pishiqlik bu tunlay bo'lmagan paxta
Cotton Cotton fibre	Paxta tolasi. Tola	Волокно хлопковое. Волокно	Paxtadan tola ajratish natijasida olingan tola mahsuloti
Cotton seed linter Linters	Paxta momig'i. Momiq	Линт хлопковый. Линт	Paxtadan tola ajratilgandan keyin chigitda qolgan kalta tola yoki chigitdan momiq ajratish natijasida olingan tolali mahsulot
Fatty cottonseeds. Milling industry cottonseeds. Oilbearing cottonseeds	Texnik chigit	Семена хлопчатника технические	Paxtani qayta ishlash natijasida paxta yog'i ishlab chiqarish uchun mo'ljallangan chigit
Planting cottonseeds	Urug'lik chigit	Семена хлопчатника посевные	Urug'lik paxtani qayta ishlash natijasida olinadigan va ekish uchun mo'ljallangan chigit
Fibrous waste. Lint and motes containing waste fiber contamination	Tolali chiqindilar	Волокнистые отходы	Paxtani qayta ishlash jarayo- nida texnologik va tashish mashinalaridan ajralib chiqqan, tarkibida ko'p miqdorda tolali materiallar mavjud bo'lgan, tegishli qayta ishlashdan so'ng xomashyo sifatida to'qimachilik va yengil sanoatida foydalanishga yaroqli chiqindilar.

Mote containing waste. Moting waste	O'lik aralashgan chiqindilar	Отходы улюкосодержащие	O'lik aralashgan chiqindilar turli darajada tuklangan, pishib yetilmagan va siniq chigitlar, tolali nuqsonlar, erkin tola, tolasiz chigit qobiqi va iflos aralashmalardan iborat massani tashkil qiladi. (TSh 30.02. 2002)
Lint fly wastes	Paxtaning kalta momig'i aralashgan chiqindilar	Отходы пухосодержащие	Paxtaning kalta momig'i aralashgan chiqindilariga momiq kondensatorlar-ining siklonlaridan hamda aspirasiya tizimidan, momiq ajratgichlaridan keyin o'rnatilgan chigit tozalagichlaridan ajralib chiqqan paxtaning kalta momikli chiqindilarini tolali materiallar tozalagichida tozalash jarayonida olingan chiqindilar kiradi. (TSh 30.01. 2002)
Lot	To'da	Партия	Bitta hujjat bilan rasmiylashtirilgan sifati bo'yicha bir xil bo'lgan ma'lum miqdordagi paxta materiali
Cotton products	Paxta mahsuloti	Хлопковая продукция	Paxtani qayta ishlash natijasida olingan tolali mahsulot va chigit
Raw cotton products	Tolali mahsulot	Волокнистая продукция	Paxta tolasi, momiq, o'lik aralashgan va paxtaning kalta momig'i aralashgan chiqindilar
Gining output	Paxta mahsulotining chiqishi	Выход хлопковой продукции	Olingan paxta mahsuloti massasining dastlabki paxta massasiga nisbati (foizlarda)
Product quality	Mahsulot sifati	Качество продукции	Mahsulotning vazifasiga binoan, ma'lum ehtiyojlarni qoniqtirishga yaroqligini ta'minlaydigan mahsulot xossalari yig'indisi (O'z Dst 622)
Sort	Mahsulot navi	Сорт продукции	Mahsulotning muayyan turi bo'yicha meyoriy hujjatlarda belgilangan bitta yoki bir nechta sifat ko'rsatkichlari gradasiyasi (O'z Dst 622)
Sorting changes	Paxta mahsulotining navdan navga o'tishi	Сортовые переходы	Qabul qilish, saqlash va qayta ishlashdagi saralash natiijasida paxta, tola va chigitlarning boshqa navlarga o'tishi

The type of cotton	Paxtaning tipi	Тип хлопка-сырца	Paxta tolasining tipiga qarab aniqlanadigan paxtaning texnologik tavsifi (O'z Dst 615)
The class of cotton	Paxtaning sinfi	Класс хлопка-сырца	Paxtaning iflos aralashmalarining massaviy ulushi va namlikning massaviy nisbati bo'yicha bo'linishi (O'z Dst 615)
The type of cotton fibre	Paxta tolasining tipi	Тип хлопкового волокна	Uzunlik ko'rsatkichi bilan aniqlanadigan paxta tolasining texnologik tavsifi (O'z Dst 604)
The class of cotton fibre	Tolaning sinfi	Класс волокна	Paxta tolasini nuqson va iflos aralashmalarining massaviy ulushi bo'yicha bo'linishi (O'z Dst 604)
The type of linters	Momiqning tipi	Тип линта	Momiqning shtapel uzunligi bo'yicha tasnifi (O'z Dst 645)
The class of linters	Momiqning sinfi	Класс линта	Iflos aralashmalarining va butun chigitlarning massaviy ulushi bo'yicha momiqni bo'linishi (O'z Dst 645)
Short fibrous linters	Kalta shtapelli momiq	Короткоштапельный линт	Shtapel uzunligi 3 mm dan qisqa bo'lgan momiq
Class of cotton seeds	Chigitning sinfi	Класс семян	Uruqlik chigitning laboratoriya sharoitida unib chiqish qobiliyati bo'yicha guruhlarga bo'linishi (O'z Dst 663)
Category of cotton seeds	Chigit kategoriyasi	Категория семян	Uruqlik chigitning namlik, ifloslik, tuklilik, mexanik shikastlanganlik va qoldiq tolalik ko'rsatkichlari bo'yicha bo'linishi (O'z Dst 663)
Waste	Kuyindi	Угары	Paxtani qayta ishlashda hosil bo'ladigan, qaytarib olinmaydigan paxta materiallarining ishlab chiqarish yo'qotilishlari
Organoleptic inspection	Sezgi a'zolari orqali nazorat	Органолептический контрол	Birlamchi axborot sezgi a'zolari orqali qabul qilinadigan nazorat (O'z Dst 621)
Control by measurement	O'lchash nazorati	Измерительный контрол	O'lchash vositalarining qo'llanishi bilan amalga oshiriladigan nazorat (O'z Dst 621)

Certified reference materials of composition and properties of substances and materials	Modda va materiallar tarkibi va xossalarning standart namunasini. Standart namunasi	Стандартный образец состава и свойств веществ и материалов. Стандартный образец	Tarkibi va xossasi attestatsiya vaqtida belgilanib, zarur o'lgan birligi va aniqligini ta'minlashga mo'ljallangan modda (material) shaklidagi o'lgan vositasi (O'z Dst 8.004)
Period of sampling	Tanlanmalarni ajratib olish davri	Период отбора выборки	Yondosh tanlanmalar yoki namunalarni mahsulot oqimidan ajratib olish paytlari o'rtasidagi vaqt oraligi (O'z Dst 766)
Sample	Namuna	Проба	Donador bo'lmagan mahsulotning nazorat qilinayotgan majmuasidan xulosa chiqarish uchun tanlab olingan miqdori
Pinpoint sample	Nuqtadan olingan namuna	Точечная проба	Donador bo'lmagan mahsulotning ma'lum joyidan bir vaqtda olingan namuna miqdori
Unified sample	Birlashtirilgan namuna	Объединенная проба	Bir to'dadan tanlab olingan nuqtadan olingan namunalar yig'indisi (O'z Dst 614, O'z Dst 643, O'z Dst 657)
Middleday sample	O'rtacha kunlik namuna	Среднедневная проба	Jamlanayotgan to'da bo'yicha har bir paxta topshiruvchi kun davomida aloxida to'plangan birlashtirilgan namunalardan tashkil topgan namuna (O'z Dst 643)
Middle sample	O'rtacha namuna	Средняя проба	Aralashtirish yo'li bilan o'rtachalashtirib birlashtirilgan (yoki o'rtacha kunlik) namuna yoki uning qismi
Testing sample	Sinash uchun namuna	Проба для испытаний	Birlashtirilgan namunadan olingan belgilangan usulga oid sinash o'tkazish uchun tayyorlangan paxta materiali (O'z Dst 614, O'z Dst 643, O'z Dst 657)
Trial sample ribbon	Namuna piligi	Пробная лента	Tolaning uzilishga bo'lgan qarshiligini, pishib yetilganligini va chiziqli zichligini aniqlash hamda yakuniy pilik tayyorlash uchun sinash uchun namunasidan (45g) cho'zish asbobi yordamida tayyorlangan paxta tolaning piligi (O'z Dst 614)

Final ribbon	Yakuniy pilik	Окончательная ленточка	Paxta tolasining uzunligini, arbitraj usulda esa tolaning uzilishga bo'lgan qarshiligini, chiziqli zichligini va uzunligini aniqlash uchun namuna piligidan tayyorlangan massasi 170-180 mg va kengligi 25 mm dan ko'p bo'lmagan tola piligi (O'z Dst 614)
Dirt content. Impurity content. Foreign matter content	Ifloslik	Засоренность	Paxta yoki paxta mahsuloti tarkibidagi iflos (organik va mineral) aralashmalar, hamda qayta ishlashga yaroqsiz paxta materiali qismi (tugunchok, tuguncha, tolali qobik va shu kabilar) ning miqdori
Trash content	Iflos aralashmalarining massaviy ulushi	Массовая доля сорных примесей	Namunadagi iflosliklar massasining paxta yoki paxta mahsuloti namunasining massasiga (foizlarda) nisbati
Organic impurities of cotton	Organik aralashmalar (paxtada va tolali mahsulotda)	Органические примеси (в хлопке-сырце и волокнистой продукции)	G'o'zaning qismlari (barg, guldon, gul, ko'sak qovachiq, shoh qismlari, shuningdek mustah-kamlikka ega bo'lmagan qurigan, chirigan va bo'lingan paxta qismlari) va iflos o'simliklardan tashkil topgan aralashmalar
Mineral impurities	Mineral aralashmalar	Минеральные примеси	Kelib chiqish tabiiy, organik bo'lmagan aralashmalar (to'proq, qum, chang)
Rated trash content	Ifloslikning hisobiy meyori	Расчетная норма засоренности	Meyori meyoriy hujjatlarda belgilanib xomashyoni hisob qilishda ishlatiladigan yoki iflosligi yuqori bo'lgan mahsulot massasini aniqlash uchun ko'llaniladigan shartli ifloslik
Maximum (allowed) rate of trash content	Ifloslikning cheklangan (ruxsat etilgan) meyori	Ограничительная (допустимая) норма засоренности	Meyoriy hujjatlar bilan belgilangan bo'lib iflosligi yuqori bo'lgan xomashyoni qabul qilish yoki mahsulot ishlab chiqarishni cheklaydigan ifloslik
Moisture	Namlik	Влажность	Paxta yoki paxta mahsulotidagi namlik miqdori (foizlarda)

Moisture regain. Moisture on dry basis	Namlikning massaviy nisbati	Массовое отношение влаги	Namlik massasining quruq modda massasiga nisbati (foizlarda) (GOST 8.221)
Moisture content	Namlikning massaviy ulushi	Массовая доля влаги	Namlik massasining nam modda massasiga nisbati (foizlarda) (GOST 8.221)
Moisture on rated basis	Meyorlangan (hisobiy) namlik	Нормированная (расчетная) влажность	Xomashyo yoki mahsulotning konditsion massasini aniqlash uchun meyoriy hujjat bilan belgilanadigan namlikning massaviy nisbatida (yoki namlikning massaviy ulushida) meyoriy namlik ifodalanadigan shartli namlik
Maximum standard rate of moisture	Namlikning cheklangan meyori	Пределная норма влажности	Yuqori namlikka ega bo'lgan xomashyoni qabul qilishni yoki mahsulot ishlab chiqarishni cheklovchi meyoriy hujjat bilan belgilanadigan namlik meyori
Rated weight	Hisobiy massa	Расчетная масса	Iflosligi hisobiy meyorga keltirilgan massa
Conditioned weight	Konditsion massa	Кондиционная масса	Meyorlangan namlikka keltirilgan hisobiy massa
Weight charge and/or discount	Massaviy chegirish va oshirish	Скидка и накидка весовая	Xomashyo yoki mahsulotning namlik va iflosligi meyorlangan namlik va xisobiy ifloslikka nisbatan o'zgarishi (oshiqligi yoki kamligi) hisobiga konditsion massasini kamaytirishi yoki oshirishi
Color of seed cotton	Paxtaning rangi	Свет хлопка-сырца	Paxta tolasining rangli tusi, rangi
Elasticity of seyedcotton	Paxtaning egiluvchanligi	Упругость хлопка-сырца	Ta'sir etuvchi kuch olingandan so'ng paxtani o'z hajmi va shaklini qayta tiklab olish xususiyati
Mote content of seed cotton	Paxta (tola) ning o'likdor-ligi	Заключенность хлопка-сырца (волокна)	Paxta (tola) dagi o'lik massasining paxta (tola) massasiga nisbati (foizlarda)
Twisting of seyedcotton	Paxtaning chigallanganligi	Загученность хлопка-сырца	Paxtadagi chigallangan qismi-ni massasining paxta massasiga nisbati (foizlarda)
Twisting increment of seed cotton	Paxta chigallanganligining oshishi	Прирост загученности хлопка-сырца	Paxta (tola)da bo'lgan chigallanganliklarni uni asbob uskunadan o'tkazishdan avval hamda o'tkazilgandan so'ng bo'lgan miqdorlari orasidagi farqi (foizlarda)

Defects of seed cotton	Paxta nuqsonlari	Пороки хлопко-сырца	Paxta terish va paxta tozalash mashinalari ishchi qismlarining ta'siri ostida hosil bo'lgan chigallangan va o'ralishgan tolali chigitlar, siniq va shikastlangan chigitlar, uzilgan va erkin tola
Volumetric density of seed cotton	Paxtaning hajmiy zichligi	Объемная плотность хлопко-сырца	Hajm birligidagi paxta massasi
Standard outward appearance of seed cotton. Seed cotton sample of external appearance. External sample of seed cotton	Paxtaning tashqi ko'rinish namunalari	Образцы внешнего вида хлопко-сырца	Paxtaning aniq bir navi va sinfiga xos bo'lgan rang, dog'lar mavjudligi, tuzilish hamda ifloslanganlik jihatidan sifat ta'riflari majmuini ifodalovchi, belgilangan tartibda tasdiqlangan paxta tolasi namunalari
Lint index	Toladorlilik indeksi	Индекс волокнистости	100 dona chigitdan olinadigan tola massasi bilan aniqlanadigan tola chiqishi ko'rsatkichi (grammlarda)
Blight Bacterialfungus disease of cotton	(Tolaning) bakterialzamburuqlar bilan zararganligi	Бактериальногрибковое поражение (волокна)	Paxta tolasini mikroorganizmlardan zararlanganligi
Cotton fiber stickiness "Honeydew"	Tolaning yopishqoqligi. Shira	Клейкость волокна "Медовая роса" сахаристые выделения хлопковой тли на волокне	Paxta bitining toladagi shakarsimon chiqindilari
Strength of fibre	Tolaning uzilish kuchi	Разрывная нагрузка волокна	Bir dona tolaning uzilishgacha ko'tara oladigan (sN yoki gk lardagi) eng katta kuch
Specific strength of cotton fibre	Tolaning solishtirma uzilish kuchi	Удельная разрывная нагрузка волокна	Tola uzilishiga olib kelgan eng katta kuchning, shu tola chiziqli zichligiga nisbati bilan aniqlanadigan kattalik (sN/teks yoki gs/teks larda)
Decrement in specific strength of cotton fibre	Tola solishtirma uzilish kuchining pasayishi	Уменьшение удельной разрывной нагрузки волокна	Paxta va tola asbobuskunadan o'tkazilganda va o'tkazilgandan keyingi solishtirma uzilish kuchlarining farqi (sN yoki gk da)
Linear density	Chiziqli zichlik	Линейная плотность	Tola massasini uning uzunligi birligicha nisbatini aniqlaydigan kattalik

Staple of cotton fibre	Paxta tolasining tarami	Штапель хлопкового волокна	Tolaning solishtirma uzilish kuchini va uzunligini aniqlash uchun qo'lda yoki asbobda tayyorlangan parallel tolalardan iborat taramcha
Cotton maturity. Cotton fibre maturity. Linter fibre maturity	Tola (paxta, momiq) ning pishib yetilganligi	Зрелост волокна (хлопка- сырца, линта)	Devor to'qimalari qalinligini o'zgarishida ruyobga chiqadigan selluloza to'planishi va g'o'zaning o'sish davrida tola ichki strukturasini o'zgarishi bilan tavsiflanadi
Maturity index	Pishib yetilganlik koeffitsiyenti	Коэффициент зрелости	Eng pishmagan tolalar koeffitsiyenti bilan, eng pishganlari esa 5 koeffitsiyenti bilan belgilangan shartli shkala bo'yicha tola pishganligini miqdoriy darajasining ko'rsatgichi
Weight staple length	Tolaning shtapel massauzunligi	Штапельная массодлина волокна	Modal massauzunligidan uzun bo'lgan tolalarning o'rtacha uzunligi (O'z Dst 633)
Mean weight staple length	Paxta tolasining o'rtacha massauzunligi	Средняя массодлина волокна	Har qaysi guruh tolalari o'rtacha uzunliklarini ularning massasiga ko'paytmalari yig'indisining hamma guruh tolalari massasiga bo'lgan nisbati
Modal weight staple length	Paxta tolasining modal massauzunligi	Модалная массодлина волокна	Eng katta massaga ega bo'lgan tola guruhining o'rtacha uzunligi (O'z Dst 633)
Shortstapled fibreshort fibre	Kalta tolalar	Короткое волокно	O'rtacha tolali paxta uchun 16 mm dan qisqa bo'lgan, uzun tolali paxta uchun 20 mm dan qisqa bo'lgan tolalar (O'z Dst 633)
Cotton length decrease	Tola uzunligining qisqarishi	Уменьшение длины волокна	Paxta va tolaning asbobuskunadan o'tkazguncha va o'tkazgandan keyingi shtapel massauzunliklari miqdorlarining farqi (millimetr-larda)

Defects of cotton fibre	Paxta tolasining nuqsonlari. Nuqsonlar	Пороки хлопкового волокна. Пороки	Paxta tolasining yigirilish xossalarini yomonlashtiruvchi har xil nuqson turlari: tugunchaklar, kombinasiyalashgan tugunchaklar, pishmagan tolalar plastigi, tolali chigit qobig'i, pishmagan chigit (o'lik), tolali maydalangan chigit, tugunchalar
Total mass fraction content of impurities and extraneous matters	Toladagi nuqson va iflos aralashmalarni-ng massaviy ulushi	Массовая доля пороков и сорных примесей в волокне	Nuqsonli tolalar va iflos aralashmalar massasining namuna massasiga (foizlarda) nisbati
Mote. Mossy cotton	O'lik	Улюк	Rivojlanmagan, massasi bo'yicha turlicha, turli rangdagi pishmagan tolalar bilan qoplangan chigitlar
Plastics of immature cotton fibre	Pishmagan tola plastigi	Пластики незрелых волокон	O'zaro yopishib qolgan pishmagan tolalar to'plami
Twists. Cattails	Tugunchaklar	Жгутики	Turli shakl va massadagi zich o'ralishgan, chigallangan tola tutami va uzmasdan qo'lda cho'zganda ajralmaydi (O'z Dst 632)
Combined twists.Group of cattails	Kombinatsiyalashgan tugunchaklar	Комбинированные жгутики	Bir nechta (ikkitadan kam bo'lmagan) chigallangan tugunchaklardan tashkil topgan guruh (O'z Dst 632)
Mote fragments with fibre	Tolali chigit qobiqi	Кожитса семян с волокном	O'lchamlari 2 mm gacha bo'lgan, sirtida tolalar qolgan chigit qobiqi (O'z Dst 632)
Neps	Tugunchalar	Узелки	Massasi 0,05 mg atrofidagi uchlari turli tomonga ketgan kichik tugun shaklidagi chigallangan tolalar (O'z Dst 632)
Cotton curls	O'ramlar	Завитки	Yengil o'ralgan, qo'lda osonlik bilan yechiladigan tolalar
Cotton seed fragments. Broken cotton seeds. Crushed cotton seeds. Fragments of large seed coat particles	Maydalangan chigit	Дробленые семена	O'lchamlari 2 mm dan katta bo'lgan sirti tolali chigitning yirik qobiq qismlari (O'z Dst 632)

Lint twists ratio	Paxta tolasining chigallanganligi	Зажгученност хлопкового волокна	Paxta tolasidagi tugunchaklar, kombinasiyalashgan tugunchaklar va tugunchalar massasining tola massasiga nisbati (foizlarda)
Fractional change of impurities content in cotton fibre	Toladagi nuqsonlar miqdorining o'zgarishi	Изменение содержания пороков в волокне	Toladagi tugunchaklar, kombi-nasiyalashgan tugunchaklar, tugunchalar, tolali chigit qobig'i, pishmagan tola plastigi, o'ramlar va maydalangan chigit miqdorini o'zgarishi (foizlarda)
HVI High volume instrumentation	HVI (Eych Vi Ay)	HVI (Эйч Ви Ай)	Paxta tolasini uzunlik, uzunlik bo'yicha bir xillik, pishiqlik, uzilishdagi uzayish, mikroneyr, rang va ifloslik ko'rsatkichlari bo'yicha yuqori samarador high volume instruments sinovlari o'lchash tizimining qisqartirilgan belgilanishi
Micronaire (Mic)	Mikroneyr ko'rsatkichi	Показатель микронейр	Tolasi namunasining havo o'tkazuvchanligiga qarab tolaning ingichkaligi va pishib yetilganligini tavsifi (O'z Dst 604)
Upper half mean length (UHM)	Yuqori o'rtacha uzunlik	Верхняя средняя длина	Tekshirilayotgan namuna massa-sining yarmini tashkil qiluvchi eng uzun tolalarning o'rtacha uzunligi bo'lib, dyuumlarda yoki millimetrlarda ifodalanadi (O'z Dst 604)
Staple length 32nds (Staple)	1/32 dyuymdan iborat shtapel uzunlik	Штапельная длина в 1/32 дюйма	Tolaning uzunligi bo'lib, u klassifikator tomonidan qo'lda tortilgan parallel tolalar shtapelini vizual, ya'ni ko'z bilan ko'rib aniqlanadi va 1/32 dyuymda (masalan, 1 1/32), yoki kodda 1/32 oraliqiga barobar miqdordagi kodda aniqlanadi (O'z Dst 604)
Short fibre index (SFI)	Kalta tolalar indeksi	Индекс коротких волокон	Namunadagi uzunligi 0,5 dyuymdan (12,7 mm) kalta bo'lgan tolalar ulushi bo'lib, foiz hisobida ifodalanadi (O'zDst 604)

Strength (Str)	Solishtirma uzilish kuchi (HVI bo'yicha)	Удельная разрывная нагрузка (по HVI)	Kalibr lanuvchi paxtaning hvi gradiurovkasida (HVI calibration cotton), gs/teks da (sn/teks) ifodalangan paxta tolasining pishiqligi (O'z Dst 604)
Mean Length (ML)	O'rtacha uzunlik	Средняя длина	Namunadagi barcha tolalarning o'rtacha uzunligi (O'z Dst 604)
Uniformity Index (Unf)	Uzunlik bo'yicha bir xillik indeksi	Индекс равномерности по длине	Tolalar o'rtacha uzunligining yuqori o'rtacha uzunlikka nisbati bilan aniqlanadigan foizlarda ifodalanadigan tavsif (O'z Dst 604)
Reflectance (RD)	Nur qaytarish koeffitsiyenti	Коэффициент отражения	Sinalayotgan paxta tolasini namunasi yuzasidan qaytgan yorug'lik miqdori, foiz hisobida ifodalanadi (o'z dst 604)
Yellowness (+b)	Sarqishlik darajasi	Степен желтизни	Sinalayotgan namuna tarkibida sarg'ishlik darajasi (O'z Dst 604)
Trash Code (T)	Tresh kod	Треш код	Begona aralashmalar maydonini 10 ga ko'paytirish yo'li bilan aniqlanadigan notolaviy aralashmalar bilan ifloslanganlik ko'rsatkichi (O'z Dst 604)
Trash Area (Area)	Iflos aralashmalar maydoni	Площадь сорных примесей	HVI tizimida o'lov asboblari yordamida aniqlanadigan iflos zarrachalarning umumiy maydoni, bu namuna yuzasini skanerlash yo'li bilan aniqlanadi hamda tekshirilayotgan namuna yuzasi maydoniga nisbatan foiz hisobida ifodalanadi (O'z Dst 604)
Elongation (ELg)	Uzilishdagi uzayishi	Удлинение при разрыве	HVI tizimidagi dinamometrda tolaning foizlarda ifodalangan uzilishdagi uzayishi (O'z Dst 604)
Cotton sample of external appearance	Paxta tolasining tashqi ko'rinish namunalari	Образцы внешнего вида хлопкового волокна	Paxta tolasining aniq bir navi va sinfiga xos bo'lgan rang, doqlar mavjudligi, tuzilish hamda ifloslanganlik jihatidan sifat ta'riflari majmuini ifodalovchi, belgilangan tartibda tasdiqlangan paxta tolasini namunalari (O'z Dst 604)

Microchemical method for determination of linters maturity	Momiqning pishib yetilganligini mikroximik usulda aniqlash	Микрохимический метод определения зрелости линта	Kimyoviy moddalar va mikroskop yordamida momiqning pishib yetilganligini aniqlash
Method for linters maturity testing in polarized light field	Qutblangan yorug'lik nurida momiqning pishib yetilganligini aniqlash usuli	Определение зрелости линта с помощью микроскопа и химических веществ	Qutblashtirilgan mikroskop yoki mikroskopga o'rnatiladigan qutblashtirilgan moslama yordamida momiqning pishib yetilganligini aniqlash
Linters staple length	Momiqning shtapel uzunligi	Штапельная длина линта	Bir cheti tekis qelib terilgan shtapeldagi momiq tolalarning asosiy massasining uzunligi
Linters sample of external appearance	Momiqning tashqi ko'rinish namunalari	Образцы внешнего вида линта хлопкового	Paxta momig'ining aniq bir navi va sinfiga xos bo'lgan rang, pishib yetilganligi, tuzilish hamda ifloslanganlik jihatidan sifat ta'riflari majmuini ifodalovchi, belgilangan tartibda tasdiqlangan paxta momg'i namunalari
The latent defects of a cotton fibre and fibrous production Inside bale a spoilage	Paxta tolasi va tolali mahsulotlarning yashirin nuqsonlari. Toy ichidagi brak	Скрытие пороки волокна хлопкового и волокнистой продукции. Внутрикипный брак	Bu nuqsonlar tashqi ko'rinishi bo'yicha nazorat natijasida topib bo'lmaydigan va toylarda: begona aralashmalar va shu jumladan chigitning mavjudligi; toylash oldidan tolaning shikastlanganligi; toyning ichki qatlamlaridan tola sifatining qatlamlardagiga nisbatan yomonroqligi; tolada paxta chiqindilarining mavjudligi oqibatida kelib chiqadi. Tola va tolali mahsulotlarning yashirin nuqsonlariga har xil nav va tiplarga mansub paxtaning ataylab aralashirilishi oqibatida kelib chiqadigan nuqsonlar ham kiradi
Fuzziness of cotton seed	Chigitning tukliligi .Tukliligi	Опушенность семян	Tolasi ajratilgandan (yoki linterlangandan yoki delinterlash-gandan) keyin chigitda qolgan momiq massasining chigitlarning dastlabki massasiga nisbati

Acidity number of cotton oil	Yog' kislotasini- ng soni	Кислотное число масла	Ishqor ta'sirida titrlanadigan yog' tarkibidagi erkin yog' kislotalari yoki boshqa moddalar miqdori
Oil content of cotton seed	Chigitning yoqdorligi	Масличность семян	Yoq massasining chigit massasiga nisbati (foizlarda)
Presence of damage in cotton seed	Nuqsonli chigit	Дефектные семена	Maqzini rangi sanoat naviga nisbatan qoramtir va maqzi qora rangli (kuygan) chigit, hamda maqzi yarimdan kam bo'lgan shikastlangan chigit, chigitning butun maqzi va uning qismlari, maqzi bo'sh bo'lgan chigitlar
Affected seeds	Kuygan chigit	Горелые семена	Yuqori xarorat va biologik omillar ta'sirida mag'izi qora rangiga o'zgargan chigit
Broken cotton seed	Siniq chigit	Битые семена	Mag'zi yarimtdan kichik chigitlar, butun mag'izlar va ularning qobiqsiz bo'lagi
Damaged cotton seeds	Shikastlangan chigit	Поврежденные семена	Siniq va darz qobiqli, ezilgan hamda chigitning 2/3 dan qatta qismini tashkil etuvchi chigit
Mineral and organic impurities content	Mineral va organik aralashmalar massaviy ulushi	Массовая доля минерального и органического сора	Mineral va organik aralashmalar massasining chigit namunasi massasiga (foizlarda) nisbati
Organic impurities of cotton seeds	Chigitlarda organik aralashmalar	Органические примеси в семенах	Barglarning, bandlarning va chanoqlarning zarrachalari, maqzsiz puch chigitlar qobiqi
Control seeds sampling unit	Chigitning nazorat birligi	Контрольная единица семян	Sifatini aniqlash uchun namuna olish mumkin bo'lgan miqdordagi massasi bo'yicha cheklangan chigit miqdori (GOST 20290)
Purity of variety Planting cotton seeds purity	Chigitning nav tozaligi	Сортовая чистота семян	Barcha tekshirilgan o'simliklarda shu navdagi o'xshash o'simliklarning foiziy miqdori
Reproduction of cotton seeds	Chigitning avlodi	Репродукция семян	Elita urug'ini ekishdan boshlab urug'ni qayta ekish ketmaketligi (GOST 20081)
Germinating ability of cotton seeds	Chigitning unuvchanligi	Всхожесть семян	Chigitning sog' unib chiqadigan nihollarini paydo qilish qobiliyati (GOST 21820.1)
Maturity of cotton seeds	Chigitning pishganligi	Зрелость семян	Chigitning eng yaxshi unib chiqa olish qobiliyatiga ega bo'lgan holati

Mechanical damage of cotton seeds	Chigitning mexanik shikastlanganligi	Механическая поврежденность семян	Paxtani mexanizmlar yordamida terganda va tashiganda chigitning shikastlanishi chigit qobiqidagi darzlar, teshiklar, qobiqi bir qismining yo'qligi)
Increment of mechanically damaged cotton seeds	Chigit mexanik shikastlanganligining oshishi	Прирост механической поврежденности семян	Chigit shikastlanganligining uni asbobuskunadan o'tkazgandan keyin va o'tkazgunga qadar bo'lgan qiymatlari farqi (foizlarda)
Burnt ability of seeds. Loss of planting abilities of cotton seeds as a result of selfheating in process of seed storage	Chigitning kuyganligi	Горелост семян	Saqlash jarayonida o'zo'zidan qizishi oqibatida chigitning urug'lik sifatleri yo'qolishi
Shriveling of cotton seeds	Rivojlanmagan chigit	Недоразвитост семян	Chigitning rivojlanmaganligi
The flaredoff treating mixture availability	To'kilgan dori aralashmasining mavjudligi	Наличие осипавшейся протравливающей смеси	Urug'lik chigitni dorilaganda dori aralashmasining chigitga yopishishini nazorat qiluvchi ko'rsatkich
Residual fuzziness of cotton seeds	Chigitning qoldiq toladorligi	Остаточная волокнистост семян	Chigitda uzunligi 6 mm dan uzun bo'lgan tola miqdorini tavsiflovchi ko'rsatkich
Evenness of seeds	Chigitning sarxilligi	Виравненност семян	To'dadagi chigitning massasi va o'lchamlari bo'yicha bir tekisliligi
Residual fuzziness of delinted seeds	Tuksizlantiril-gan chigitning koldikli tukdorligi	Остаточная опушенност оголенных семян	Tuksizlangandan keyin chigitlarda qolgan tuklar massasining chigitning dastlabki massasiga nisbati (foizlarda)
Assortiment of seed cotton	Paxtaning assortimenti	Ассортимент хлопка-сырца	Paxtaning umumiy massasida alohida navlarning tarkibini va nisbatini ko'rsatuvchi sifat tavsifi
State procurement of seed cotton	Paxta tayyorlash	Заготовка хлопка-сырца	Paxta tayyorlash punktlarida paxtani qabul qilish, uning sifatini va miqdorini aniqlash, saralash, jamlash, saqlash va paxta topshiruvchilar bilan hisobkitob qilish bilan boqliq bo'lgan ishlar majmuasi

Cotton receiving	Paxtani qabul qilish	Приемка хлопка-сырца	Paxta ekuvchi jamoa xo'jaliklardan davlatga sotilayotgan paxtani paxta tayyorlash punktlarida qabul qilish
Assorting of seed cotton	Paxtani saralash	Сортировка хлопка-сырца	Keltirilayotgan paxtani pishib yetilganlik koeffitsiyenti, iflosligi va namligini hisobga olgan holda navlari va tashqi ko'rinishi bo'yicha ajratish
Distribution by homogeneous lots. Sorting seed cotton by lots	Paxta to'dalarini jamlash	Разделение подвозимого хлопка-сырца по сортам по внешнему виду с учетом коэффициента зрелости, засоренности и влажности	Asosiy belgilari (seleksiya navi, sanoat navi, texnikaviy va uruqlik, qo'lda yoki mashinada terilgan) bo'yicha xo'jaliklardan qabul qilinayotgan paxtaning namlikning massaviy nisbati va iflos aralashmalarining massaviy ulushini hisobga olib qayta ishlash va saqlash uchun alohidaalohida to'da tashqil qilish
Seed cotton distribution by lotseyed cotton sorting in lot	Jamlanayotgan to'da	Комплектование партий хлопка-сырца	Qabul qilinayotgan to'dadan qaramga (yoki omborga) joylashtirayotgan paxtaning asosiy alomatlari bo'yicha bir turdagi massasi
Completed seyed cotton lot	Jamlangan to'da	Комплектуемая партия	Qabul qilinayotgan to'dalarni jamlab tugatilganidan so'ng paxtaning asosiy alomatlari bo'yicha bir turdagi massasi
Seed cotton storage	Paxtani saqlash	Скомплектованная партия	Quritishozalash sexlarida ishlov berguncha va undan keyin paxta tozalash zavodlarida qayta ishlanguncha paxta to'dalarini g'aramlar va omborlarda asrash va bu davrda uni saqlash bilan bog'lik bo'lgan chora tadbirlar
Stacking site	G'aramlash uchun maydoncha g'aramlash maydonchasi	Бунтовая площадка	Saqlash uchun paxta g'aramlanadigan hamma tomoni ochiq, ma'lum o'lchamdagi maxsus tayyorlangan maydoncha
Stacking.Process of stacking	Paxtani g'aramlash	Бунтование хлопка-сырца	G'aramni shakllantirish jarayoni
Seed cotton stack	G'aram	Бунт	G'aramlangan va saqlash uchun brezent bilan yopilgan kesik piramida shaklidagi zichlangan paxta massasi

Stripping of seed cotton stack	G'aramni tarash	Очесивание бунта	G'aram devorlaridan bo'rtib chiqib turgan paxtani tushirish
Stack stability	G'aram mustahkamligi	Устойчивост бунта	G'aramlash maydonchasiga joylangan paxta massasining o'z shaklini buzmay saqlash qobiliyati
Stack crumbling	G'aramning qulashi	Обвал бунта	O'zining gravitasiya va yonga kengaytiruvchi kuchlar ta'siri ostida g'aramdan paxta massasining ajralib qulab tushishi
Seed cotton storage	Paxtani joylash	Складирование хлопка-сырца	Paxtani ochiq maydonchalarda g'aramlarda yoki omborlar, shiyponlarga joylash
Spontaneous heating of seed cotton	Paxtaning o'z-o'zidan qizishi	Самосогревание хлопка-сырца	Tashqi muhitdan izolyatsiyalangan namligi yuqori bo'lgan paxtaning hajmlarining nazorat qilinmaydigan harorati ko'tarilishining biokimyoviy jarayoni
Continuous seed cotton heating	Yalpi o'z-o'zidan qizish	Сплошное самосогревание	G'aramda saqlanayotgan hamma paxtaning yuqori haroratda qizishi
Pocket heating Receptacle heating	Uyalarda o'z-o'zidan qizish	Гнездовое самосогревание	Saqlanayotgan paxtaning yuqori haroratga ega bo'lgan ayrim joylari
Degradation of lower and side layers of seed cotton being put in stacks and storages at cost of moisture absorption from the site surface and outside it	Pastki yon chirishi	Порча нижних и боковых слоев хлопка-сырца	Maydoncha yuzasida va tashqarisida bo'lgan namlikni o'ziga shimishi hisobiga g'aram va omborlarga joylangan paxtaning pastki va yon tomonlarining shikastlanishi
Operative and mechanized storage	Tezkor mexanizatsiyalashgan ombor	Оперативный механизированный склад	Paxtani qabul qilib, uni qayta ishlash va keyinchalik ishlab chiqarishga jo'natgunga qadar qiska muddat saqlashga mo'ljallangan ko'chmas uskunalar bilan jihozlangan ombor
Feederthrower distributor	Otqichtaqsimlagich	Метателраспределитель	G'aramlagich bunkerida ombor maydoniga paxtani bir tekisga tashlab beruvchi hamda taqsimlovchi mexanizm
Stacking builder	G'aramlagich	Бунтоукладчик	G'aramni shakllantirish uchun ko'chma qurilma

Reloader device	Qabul qilib uzatuvchi qurilma	Приемоподающее устройство	Tarasiz transport vositalari (traktor tirkamasi, paxta tashigich mashina) da keltirilayotgan paxtani qabul qilish va uni boshqa transport vositalariga uzatish uchun qo'chma yoki qo'chmas mexanizm
Mobile belttype cotton conveyer	Tasmali ko'chma konveyer	Передвижной ленточный конвейер	Paxta va chigitni sochilgan holda qabul qilish va g'aramlash maydochasiga, omborga uzatish uchun ishlatiladigan qo'chma mexanizm
Shielded throw off cotton or cottonseed disengage device	Qalqonsimon tushirgich	Шитковый сбрасыватель	Tasmali konveyerlarning gorizontal qismida tasmadan paxta yoki chigitni omborning ma'lum joyida saqlashga tushirish uchun o'rnatiladigan qalqon
Mobile extended step ladder	Surilma narvon	Видвижная лестница	Paxta g'aramlariga ishlov berishda foydalaniladigan qo'zqalvchan qurilma
Tunnel formation process. Ventilation through tunnel formation in cotton stacks (by hand digging or using mechanical means)	Tunnel hosil qilish	Туннелеобразование	G'aramlarda shamollatish uchun foydalaniladigan ikki tomoni ochiq tunnel hosil qilish
Telescopic type mobile tunnel digging machine	Teleskopik tunnel teshuvchi mashina	Телескопический туннелеобразователь	G'aramlarda tunnel hosil qilish uchun ishlatiladigan qo'zqaluvchan mashina
Aeration of stack	G'aramni shamollatish	Вентилирование бунта	Tunnellar yoki qaramlash maydonchasidagi maxsus qanallar orqali so'ruvchi qurilma yordamida paxtani majburiy shamollatish
Air discharge channel	Shamollatish kanali	Воздухоотводящий канал	Paxtani majburiy shamollatish uchun qaramlar maydonchasidagi kanal
Air discharge unit	So'ruvchi qurilma	Отсасивающая установка	G'aramni majburiy shamollatish uchun qo'chmas yoki qo'chma qurilma
Breaking out seed cotton of cotton stack	Paxta g'aramini buzish	Разборка бунта	Keyinchalik tashishga yoki korxonaga jo'natish uchun paxta g'aramining umumiy massasidan paxta olish

Stack feyeding machine. Machine for moving seed cotton from stack to gin	G'aram buzgich	Разборщик бунтов	G'aramlardagi paxtani buzish va uni tarasiz tashish vositalariga yuklovchi qo'chma mexanizm
Unpacked transportation of the seed cotton	Paxtani tarasiz tashish	Бестарная перевозка хлопка-сырца	Transport vositalari kuzovida paxta tashish
Feyederdispenser unit	Buzgich ta'minlagich	Разборщик питатель	G'aram (ombor) lardagi paxtani buzish va uni ishlab chiqarishga uzatish uchun qo'chma mexanizm
Seed cotton resistance to dispersing process Resistance to break out seed cotton from layout mass	Paxtaning buzishga qarshilik ko'rsata olishi	Сопrotивляемость хлопка-сырца разборке	Joylangan paxta massasidan bir qismini ajratish uchun zarur bo'lgan kuch
Transport ability of seed cotton	Paxtaning tashishga qulayligi	Транспортабельность хлопка-сырца	Turli sifat tavsifiga ega bo'lgan paxtani uzluksiz tashish vositalarida imkoni boricha yuqori ish unumida jo'natilish qobiliyati
Cotton raw material sender	Paxta topshiruvchi	Сдатчик хлопка-сырца	Paxtani qabul qilish punktlariga topshiruvchi xo'jalik (jamo'a xo'jaligi, brigada, fermer)
Cottongrower, cotton farmer, cotton supplier	Paxtani quritish va tozalash. Paxtani va paxta tolasini namlash	Сушка и очистка хлопка-сырца. Увлажнение хлопка-сырца и волокна	Paxtani quritish va tozalash. Paxtani va paxta tolasini namlash
Predrying and/ or precleaning of seed cotton	Paxtaga ishlov berish	Подработка хлопка-сырца	Paxta tayyorlash punktlarida paxtani saqlashga tayyorlash maqsadida oldindan quritish va tozalash ishlari
Seed cotton drying	Paxtani quritish	Сушка хлопка-сырца	Paxtani qayta ishlash jarayonida undagi ortiqcha namlikni yo'qotish texnologik operatsiyasi
Rock and green boll catcher /trap	Og'ir ko'shilmalarni tutkich	Уловитель тяжелых примесей	Paxtadan og'ir begona qo'shilmalarni ajratib oluvchi qurilma
Catching efficiency	Tutish samarasi	Улавливающий эффект	Begona oqir aralashmalarni tutkich tomonidan ajratilgan ko'shilmalar (tosh, metall va hokazo) massasining paxtaga ishlov berishdan avval bo'lgan aralashmalar massasiga nisbati (foizlarda)
Seed cotton drer	Quritgich	Сушилка	Paxta massasidagi namlikni yo'qotuvchi apparat

Heat generator. Heater	Issiqlik generatori	Теплогенератор	Quritish agentini ishlab chiquvchi agregat
Drying agent. Drying air	Quritish agenti	Сушильный агент	Quritilayotgan materialga bevosita tegishi va issiqlik almashinuvida undan chiqariladigan namlikni qabul qiluvchi quruq gazlar va suv bug'ining gazzimon muhiti (havo, yonilqi yonishidan hosil bo'lgan mahsulotlar)
Moisture removal	Namlikni tortib olish	Влагоотбор	Quritish jarayonida paxtadan bug'lanib chiqqan namlik massasining quruq paxta massasiga nisbati (foizlarda)
Overflow hopper	Yig'uvchi bunker	Бункер накопитель	Ishlab chiqarishga bir meyorda uzatishni ta'minlash uchun paxtani yig'uvchi moslama
Seed cotton cleaning	Paxtani tozalash	Очистка хлопка-сырца	Paxtadan iflos aralashmalarni ajratish texnologik operatsiyasi
Seed cotton cleaner	Paxta tozalagich	Очиститель хлопка-сырца	Paxtani iflos aralashmalardan tozalovchi mashina
Saw cleaner of seed cotton	Arrali paxta tozalagich	Пилчатый (пилный) очиститель хлопка-сырца	Paxtani yirik iflosliklardan tozalashga mo'ljallangan, ishqalash cho'tkalari, kolosnik panjaralar bilan birga ishlaydigan arrali barabanlari (arrali silindrlari) bor bo'lgan mashina
Spikeddrum seed cotton cleaner	Qoziqli paxta tozalagich	Колковый очиститель хлопка-сырца	Paxtani mayda iflosliklardan tozalashga mo'ljallangan g'alvirsimon to'r (chiviq to'rli) bilan birga ishlaydigan, qoziqli barabanlari bor bo'lgan tozalagich
Cotton cleaning machine	Paxta tozalash agregati	Хлопкоочистительный агрегат	Oraliq transport vositalari bilan biriktirilmagan paxtani tozalagichlar va (yoki) ularning tozalash seksiyalari
Cleaning ratio	Tozalash soni	Кратность очистки	Bir turdagi mashinalardan paxtani o'tkazish soni
Cleaning schedule	Tozalash rejasi	План очистки	Paxtani tozalagichlardan rejalashtirilgan ketma-ketlik bo'yicha o'tkazish
Cleaning efficiency	Tozalash samarasi	Очистительный эффект	Paxta materialidagi uni tozalashgacha va tozalagandan keyingi ifloslik (o'lik, nuqson) lar farqining tozalashgacha bo'lgan ifloslikka nisbati (foizlarda)

Regeneration of flying seed cotton	Paxtaning chiqindilaridan tolali chigitlarni regeneratsiyalash	Регенерация летучек хлопка-сырца	Paxtaning chiqindilaridan tolali chigitlarni olish texnologik operatsiyasi
Seed cotton regenerator Seed cotton reclaimer	Paxta regeneratori	Регенератор хлопка	Paxta tozalagich chiqindilaridan tolali chigitlarni ajratib oluvchi mashina
Regeneration/ reclaiming efficiency (of seed cotton)	Regeneratsiyalash samarasi (paxta bo'yicha)	Эффективность регенерации	Chiqindilardagi tola chigitlarning regeneratsiyalashgacha va undan keyingi miqdorlarning farqini regeneratsiyalashgacha bo'lgan miqdoriga nisbati (foizlarda)
Cotton separation	Paxta taqsimlagich	Распределитель хлопка	Paxtani tolali chigitlarga bo'luvchi mashina
Loosing efficiently	Titish samarasi	Разрыхлительный эффект	Paxtani titishgacha va undan keyingi titilganlik koeffitsiyentlari farqining birga kamaytirilgan titishgacha bo'lgan titilganlik koeffitsiyentiga nisbati (foizlarda)
Index of loosing	Titilganlik koeffitsiyenti	Коэффициент разрыхленности	O'zaro bog'langan tolali chigitlar shaklidagi paxta qismida paxta tolali chigitlari sonining o'rtacha miqdori (uning eng katta qismi pallachaga teng)
Pulsedspeed variator	Impulsi variator	Импульсный вариатор	Texnologik asbobuskunalarni ta'minlovchi valiklarning aylanish chastotasini sozlovchi mexanizm
Equilibrium humidity	Muvozanatli namlik	Равновесная влажность	Paxta fazaviy muvozanat xolati bo'lib, bu xolda suyuqlik va uning bug'ining kimyoviy potentsiallari tenglashganligi kuzatiladi
Chemical potential	Kimyoviy potentsial	Химический потенциал	Bug'simon namlikning ko'chish potentsiali bo'lib, xarorat va nisbiy namlikning funksiyasidir (dj/mol)
Technological humidity	Paxtaning texnologik namligi	Технологический влажность хлопка-сырца	Meyori texnologik jarayonni (tozalash, tola ajratish) tola va chigitning tabiiy xususiyatlarini maksimal saqlagan xolda eng samarali o'tishini ta'minlab berish uchun mo'ljallangan namlik imkoni.

Gain of humidity	Namlikning oshishi	Прирост влажности	Paxta materialini namlashgacha va namlashdan keyingi namliklarining farqi (foizlarda)
MoisteningHumidification	Namlash	Увлажнения	Paxta va tolali mahsulot namligini oshirish bo'yicha texnologik operatsiya
Moistening efficiency	Namlash samarasi	Увлажнительный эффект	Namlashdan oldin va namlangandan keyin bo'lgan paxta materiali namliklarining farqi (foizlarda)
Humidifying the device	Namlagich	Увлажнитель	Paxta materiali namligining oshishini ta'minlovchi qurilma
Free lint	Erkin tola	Свободное волокно	Chigitga birikmay, unga erkin ilashib qolgan tola
Free lint content	Paxtadagi erkin tola miqdori	Содержание свободного волокна в хлопке-сырце	Paxtadagi erkin tola massaning paxta massasiga nisbati (foizlarda)
Free lint content change	Erkin tola miqdorining o'zgarishi	Изменение содержания свободного волокна	Paxtani asbob-uskunadan o'tkazgandan keyin va o'tkazguncha unda bo'lgan erkin tolalar miqdorining farqi (foizlarda)
Index of seed cotton flyings structure	Paxta strukturasi ko'rsatkichi	Коэффициент структуры хлопкоасирса	Pallachalarga birikkan chigitli tolalarning o'rtacha vazniy soni
Cotton ginning process	Tola ajratish	Джинирование	Paxta tolasini chigitdan ajratish jarayoni
Saw ginning process	Arralar bilan tola ajratish	Пилное дженирование	Arrali jinlarda tolani arratishlari bilan ilib olib kolosniklar oralig'ida tolani chigitdan ajratish texnologik operatsiyasi
Battery flowcontrol hopper	Bunkerli qator ta'minlagichi	Батарейный бункер питатель	Paxtani jinlarda qayta ishlash uchun bir tekisda berib turuvchi qurilma
Flowcontrol of gin stand or linter machine	Jin, linter ta'minlagichi	Питатель джина, линтера	Jinlarni paxta bilan, linterlarni esa chigit bilan bir tekisda ta'minlovchi qurilma
Saw gin stand	Arrali jin	Пилный джип	Arralar bilan tola ajratish mashinasi
Overflow hopper	Oshiqcha paxta bunkeri	Бункер излишков	Jinlar qatori oxirida joylashgan oshiqcha paxtani yig'ish va texnologik tizimga qaytarish uchun siqim

Roller ginning process	G'olalar bilan tola ajratish	Валичное дженирование	G'olali jinlarda tolani ishchi baraban bilan ilashtirib olib, ishchi g'ola sirtiga qattiq siqilgan pichoq tagidan o'tkazib, chigitni uruvchi baraban bilan ajratish orqali tolani chigitdan ajratish texnologik operatsiyasi
Battery vacuum cotton feeder	Vakuimli qator ta'minlagich	Батарейный вакуумный питатель	G'olali jinlar qatorini ta'minlovchi pnevmotransport quvuriga paxtani bir tekisda berib turuvchi qurilma
Roller gin stand	G'olali jin	Валичный джин	G'olalar bilan tola ajratish mashina
Lint cleaning process	Tolani tozalash	Волокноочистка	Toladan iflos aralashmalar va tolali nuqsonlarni ajratish texnologik operatsiyasi
Lint cleaner	Tola tozalagich	Очиститель волокна	Toladan nuqson va iflos aralashmalarni ajratuvchi mashina
Strike pin	Uruvchi qoziq	Бильный колок	Tolali mahsulotlarni tozalashda ishlatiladi
Fuzzy seeds (ginned or delinted cotton seeds)	Tukli chigit	Опушенные семена	Tola ajratish va linterlashdan keyin sirtida turli uzunlikdagi tolalari va momiqi bo'lgan chigit
Delint.Under fleece	Chigit tuki	Подпушек семян	Linterlashdan keyin chigit sirtida qoladigan tolalar
Linting	Linterlash	Линтерование	Tolasi ajratilgandan keyin chigitdan momiqni ajratish texnologik operatsiyasi
Linter	Linter	Линтер	Chigitdan momiqni ajratish mashinasi
Linting cut ratio	Linterlash soni	Кратность линтерования	Chigitni linterdan o'tkazish soni
Linters cutoff	Chigitdan momiq ajratish	Линтерование семян хлопчатника	Ajratilgan momiq massasining momiq ajratilguncha bo'lgan chigit massasiga nisbati (foizlarda)
Linters cleaning	Paxta momig'ini tozalash	Очистка линта	Momiqdan iflos aralashmalarni ajratish texnologik operatsiyasi
Linters cleaner	Momiq tozalagich	Линтоочиститель	Momiqni iflos aralashmalardan tozalovchi mashina
Seed cleaning	Chigit tozalash	Очистка семян	Chigitdan begona aralashmalar, rivojlanmagan va maydalangan chigitlarni ajratish texnologik operatsiyasi

Seed cleaner	Chigit tozalagich	Семеочиститель	Chigitdan begona aralashmalar, rivojlanmagan va maydalangan chigitlarni ajratuvchi uskuna
Seed hopper storage facility	Chigit uchun bunkerli ombor	Бункерный склад для семян	Chigitni yiqish va u bilan transport vositalarini mexanizmlar vositasida to'ldirish uchun qurilma
Cotton planting seeds preparation	Urug'lik chigit tayyorlash	Подготовка посевных семян	Urug'lik chigitni standart talablariga javob beradigan holga keltirish uchun bajariladigan (tozalash, tuksizlashtirish, saralash va dorilash) hamda uning sifatini tekshirish texnologik jarayonlari majmuasi
Mature seeds	Pishgan chigit	Зрелые семена	To'q jigarrang yoki qora jigarrang qobiqli mukammal chigitlar
Immature seeds	Pishmagan chigit	Незрелые семена	Och jigarrang sariq, hatto, oq rangdagi qobiqli pishib yetilmagan chigitlar
Seed separation	Chigitni saralash	Сортирование семян хлопчатника	Chigitni morfologik va xo'jalik alomatlari bo'yicha uruqlik fraksiyasiga ajratish
Thousand seed weight	1000 ta chigitning massasi	Масса 1000 семян	Chigit yirikligi va ma'lum darajada mag'izi to'laligi ko'rsatkichi (grammlarda)
Thousandseed weight increment	1000 ta chigit massasining ortib borishi	Прирост массы 1000 семян	1000 ta chigit massasining saralashgacha va saralashdan keyin bo'lgan miqdorlarining farqi (grammlarda)
Sizing seed grading	Chigit saralagich	Семесортировщик	Chigitni saralash mashinasi
Trier (machine for separation /sorting by length cotton seeds and seeds of different grain cultures)	Triyer	Триер	Chigit va boshqa urug'lik don mahsulotlarini uzunligi bo'yicha saralash mashinasi
Seed fraction	Chigit fraksiyasi	Фракция семян	Shakli, o'lchamlari va hajmiy massasi bo'yicha o'xshash chigitlar (GOST 20081)
Delinting of seeds	Chigitni tuksizlantirish	Оголение семян	To'kiluvchanlik xususiyatini oshirish uchun chigit sirtida momiq ajratgandan keyin qolgan kalta tolalarni tushirish
Delinter	Chigit tuksizlantirgich	Семеоголитель	Chigit tuksizlantirish mashinasi

Mechanical delinting	Mexanik tuksizlantirish	Механическое оголение	Mexanik ta'sir vositasida urug'liq chigitni tuksizlantirish
Acid delinting	Kimyoviy tuksizlantirish	Химическое оголение	Kimyoviy moddalar ta'siri vositasida urug'liq chigitni tuksizlantirish
Acid and mechanical delinting	Kimyoviy-mexanik tuksizlantirish	Химико-механическое оголение	Dastlab chigit momiq qatlamining kimyoviy moddalar yordamida strukturasini buzib, keyin mexanik ta'sirlar yordamida tuksizlantirish
Delinting	Delinterlash	Делинтерование	Linterlangan chigitning kalta momiqlarini olish jarayoni
Delinter machine	Delinter	Делинтер	Chigitni delinterlash mashinasi
Delinted seeds	Tuksizlangan chigit (tuksizlantirilgan)	Оголенные семена	Qolgan mayda tolalari chigit umumiy massasining 0,2% dan ko'p bo'lmagan chigit
Seed grading	Chigitni kalibrlash	Калибрование семян	Chigitni o'lchamlari bo'yicha fraksiyalarga ajratish (GOST 20081)
Seed treatment	Chigitni dorilash	Протравливание семян	O'simliklarni turli kasalliklardan va qishloq xo'jalik zararkundalaridan muhofaza qilish maqsadida kimyoviy dorilar bilan zararsizlantirish
Fullness of seed treatment	Chigit dorilanishining to'liqligi	Полнота протравливания семян	Dorilangan chigitdagi dori miqdorining meyoriy texnik hujjat bo'yicha ishlatilish kerak bo'lgan dori miqdoriga nisbati (foizlarda)
Seed treatment agents	Chigit dorilari	Протравители семян	Chigitni o'simlik kasalliklaridan, zararkundalardan va kasallik uyqotuvchilardan muhofaza qilish uchun preparatlar
Seed coating	Chigitni qobiqlash	Дражирование семян	Granul (draje) shaklini berish uchun urug'lik chigitni turli moddalar aralashmalari bilan qobiqlash
Capsule coating of seeds	Chigitni kapsulalash	Капсулирование семян	Urug'lik chigitni polimer qatlam (kapsula) bilan qoplash
Elite seeds. Stock seeds	Elita chigiti	Семена элиты	Maxsus seleksion urug'chilik usullarini qo'llab elita urug'i hosildan olingan nav va urug'chilik bo'yicha elita urug'i uchun meyoriy texnik hujjatlar talablariga javob beradigan chigit (GOST 20081)

Seed loss	Chigitning yo'qotilishi	Потери семян	Tayyorlash jarayonida chiqindiga chiqib ketgan chigitlar massasining chigitlarning dastlabki massasiga nisbati (foizlarda)
Processing wastegood waste	Qaytariladigan chiqindilar	Возвратные отходы	Tola ajratishdan, tola tozalashdan tolani va momiqni kondensorlashdan va chigitni tozalashdan chiqqan va tarmoqda keyingi qayta ishlashga yaroqli bo'lgan chiqindilar
Fly waste	Qaytmas chiqindilar	Невозвратные отходы	Texnologik uskunalardan chiqib tarmoqda keyingi qayta ishlashga yaroqsiz chiqindilar
Lint waste content Linty wastage	Chiqindilarning tolali qismi	Волокнистая часть отходов	Tola bilan qoplangan yetilmagan chigit, tolali nuqsonlar va erkin tola
Good waste cleaning	Qaytariladigan chiqindilarni tozalash	Очистка возвратных отходов	Qaytariladigan chiqindilardan iflos va tolali aralashmalarni ajratish texnologik operatsiyasi
Linty materials cleaner Machine to remove trash impurities from good waste or linters	Tolali materiallarni tozalagich	Очиститель волокнистых материалов	Qaytar chiqindilardan va momiqdan iflos aralashmalarni ajratuvchi mashina
Regeneration of fibre off waste	Chiqindilardan tolani regeneratsiyalash	Регенерация волокна из отходов	Chiqindilardan tolani regeneratsiyalash
Regeneration efficiency (on fibre)	Regeneratsiyalash samarasi (tola bo'yicha)	Регенерационный эффект (по волокну)	Chiqindilardagi, ularni regeneratsiya qilingungacha va undan keyingi yigiriladigan tola miqdori (foizlarda) farqining tolani regeneratsiya qilingungacha bo'lgan miqdoriga nisbati
Lint retriever.Lint reclaimer	Tola regeneratori	Регенератор волокна	Tolali chiqindilardan yigiriladigan tolani chiqarib oluvchi mashina
Lint wastage content	Chiqindilardagi tolali material yoki uning komponentlari miqdori	Волокнистые материалы в отходах	Chiqindilarda qolgan paxtali material yoki uning tashkil etuvchi (tolali chigit, erkin tola, momiq, chigit) massasining chiqindi massasiga nisbati (foizlarda)
Fibrous waste content	Chiqindilarning toladorligi	Волокнистость отходов	Chiqindilardagi tolali qismining massasining chiqindilar massasiga nisbati (foizlarda)

Spinnable fibre	Yigiriladigan tola	Прядомое волокно	O'rtali tolali paxta navlaridan olingan uzunligi 16 mm dan ortiq va uzun tolali paxta navlaridan olingan uzunligi 20 mm dan ortiq bo'lgan tola
Percentage of spinnable fibre in waste	Chiqindilar tarkibidagi yigiriladigan tola miqdori	Масса прядомые волокна в отходах	Chiqindilardagi yigiriladigan tola massasining chiqindilar massasiga nisbati (foizlarda)
Tramping of fibrous product	Tolali mahsulotni shibbalash	Трамбование волокнистой продукции	Presslash kamerasiga tushguncha tolali mahsulot massasini dastlabki shibbalash
Pressing of fibrous products	Tolali mahsulotni presslash	Прессование волокнистой продукции	Tolali mahsulot massasini pressning nominal quvvatida zichlash
Hydraulic press	Gidravlik press	Гидравлический пресс	Tolali mahsulot massasini presslash mashinasi
Lint packing in bales. Packaging or baling of fibrous production	Tolali mahsulotni paketlash	Пакетирование волокнистой продукции	Tolali mahsulotni shibbalash, zichlash, o'rash va toylarni boqlash bilan boqliq bo'lgan ishlar majmuasi
Kip fiber products	Tolali mahsulot toyi. Toy paxta	Кип волокнистой продукции	Belgilangan o'lchamlarda presslangan, o'ralgan va bog'langan tolali mahsulot massasi
Tare	Tara	Тара	Toyni o'rash uchun o'rash matolari qismlarining to'liq to'plami
Bale strapping	Toyni bog'lash	Обвязка кипи	Pressda toyga belboqlar o'tkazib, ular uchlarini birlashtirish
Bale straps.Bale strapping ties	Bog'lash belbog'lari	Обвязочные пояса	Toylarni bog'lash uchun metall belbog'lar
Bale marking	Toyga belgi qo'yish	Маркировка кипи	Toyning qabariq tomonlaridan birining sirtidagi o'rov matosiga (yoki belgi quyiladigan yorliqqa) standartda belgilangan mahsulot haqidagi ma'lumotlarni yozish
Stacking of bales	Toylarni shtabel usulida taxlash	Штабелирование кипи	Yuklash maydonchalarida va omborlarda toylarni belgilangan tartibda to'dalar bo'yicha taxlash
Screw conveyer. Screw	Vintli konveyer. Shnek	Винтовой конвейер. Шнек	Paxtani va chigit chiqindilarini texnologik asbobuskunalarga yetkazish va ulardan olib ketish uchun mexanik transport vositasi
Separator	Separator	Сепаратор	Paxtani tashuvchi havodan ajratish mashinasi

Condenser	Kondensor	Конденсор	Tolali mahsulotni tashuvchi havodan ajratish yo'li bilan dastlabki zichlovchi mashina
Elevator	Elevator	Элеватор	Paxta, chigit va chiqindilarni tik yo'nalishda tashuvchi mexanik transport vositasi
Stationary belt conveyer	Tasmali qo'chmas konveyer	Стационарный ленточный конвейер	Paxta materiallarini balandlikka hamda ma'lum masofaga tashuvchi ko'chmas mexanik vositasi
Widespread seed loader	Keng qamrovli chigit yuklagich	Широкофронтный погрузчик семян	Bunkerli ombor yoki ochiq maydonchada yotgan chigitni vintli ishchi organ bilan avtotransport kuzoviga yoki temir yul vagonlariga yuklashda ishlatiladigan yuklagich
Spill of cotton material	Sochilgan paxta materiali	Россып хлопкового материала	Mexanik transport vositalari bilan tashishda to'kilgan paxta materiali massasining paxta materialini tashishdan oldingi massasiga nisbati (foizlarda)
Pneumatic conveyer. Air conveyer	Pnevмотransport	Пневмотранспорт	Havo oqimi bilan o'tkazuvchi quvurlar bo'yicha paxta materialini tashuvchi qurilmalar tizimi
Stationary or movable air conveyer plant for seed cotton conveying	Oshirish agregati	Перевалочный агрегат	Paxtani tashish uchun qo'chma yoki qo'chmas transport qurilmasi
Saw disk	Jin (yoki linter) arrasi. Arra	Пила джинная (или линтерная). Пила	Atrofida ma'lum shakl va o'lchamlarda tishlar chiqarilgan po'lat disk
Cutting of saw teeth	Arraga tish kesish	Насечка зубев пил	Arralarda tish hosil qilish
Saw teeth cutting plant/Sawteething machine	Arraga tish kesish stanogi	Пилонасекательный станок	Arralarda tish chiqarish uchun stanok
Sawteeth filing	Arra tishlarini charxlash	Заточка зубев пил	Arradagi tishlarni charxlash
Automation saw teeth filing	Avtomat arra charxlagich	Автоматическая пилоточка	Arra tishlarini charxlash uchun stanok
Manufacturing of chamfered edges of saw disks	Arralarda raх hosil qilish	Получение фасок на пилах	Arra tishlari yon korrallaridan ma'lum o'lchamda metallni kesib tashlash
Selfautomation plant for chamfered edges grinding	Raxlarni silliqlovchi yarim avtomat stanok	Устройство для шлифовки зубев пил	Jin yoki linter arralarida raxlarni silliqlash uchun stanok

Sawteeth grinding	Arralar tishlarini silliqdash	Шлифовка зубев пил	Arralar tishlari qirovini yo'qotish va ularning o'tkir qirralarini silliqdash
Sand bath	Qumli vanna	Песочная ванна	Arra tishlarini silliqdash uchun qurilma
Saw disk leveling Saw disk dressing. Saw disk straightening	Arralarni tekislash	Рихтовка пил	Arralardan yassilikdan yo'l qo'yib bo'lmaydigan oqishni yo'qotish
Saw profilesaw gauge	Andaza	Шаблон	Jin va linter arralari, kolosnik va ishchi kamera profillarini nazorat uchun o'lchash asbobi
Control rod	Tekshirish reykasi	Контрольная рейка	Yig'ishda arralarning silindrda to'g'ri joylanganligini tekshirish uchun moslama
Space ring	Arra oraliq qistirgichi	Пилная прокладка	Arralar oraliq'idagi o'lchamalarni belgilash uchun ular orasiga valga o'rnatiladigan disk
Rib	Kolosnik	Колосник	Paxta va paxta mahsulotidan ayrim tashkil etuvchilarni ajratish uchun detal
Huller ribs	Kolosnikli panjara	Колосниковая решетка	Jin yoki linter ish kamerasida kolosniklar yig'masi
Cotton dust	Paxta changi	Хлопковая пил	Gaz muhitida uchib yuruvchi holatdagi eng mayda qattiq organik va mineral zarrachalardan tashkil topgan aerosol
Air dust concentration ratio	Havoning changlangan darajasi (havodagi paxta changining konsentratsiyasi)	Степен измельчения частиц пили	Havo hajm birligidagi paxta changi zarrachalarining massasi
Dust dispersibility	Chang maydaliyligi	Дисперсност пили	Chang zarrachalarining maydalan-ganlik darajasi
Air discharges	Atmosferadagi chiqarilmalar	Атмосферные выброси	Tozalangandan so'ng texnologik va shamollatish uskunalaridan chiqib ketadigan changli havo
System of aspiration	Aspiratsiya tizimi	Система аспирации	Ishlaganda asbobuskunalar ajralib chiqadigan paxta changlaridan havoni tozalash qurilmalari tizimi
Dust catcher	Chang tutkich	Пилеуловитель	Havo oqimidan paxta changini tutish (ajratish) uchun qurilma

Multistage dust remover	Ko'p pog'onali chang tutkich	Многоступенчатый пилеуловитель	Havodagi paxta changini bir necha poqonada ketma-ket ajratadigan chang tutish uskunalari
Air cleaning efficiency	Havoni tozalash darajasi. Chang tutish samarasi	Степен очистки воздуха. Пилеулавливающий эффект	Havo tozalanguncha va tozalangandan keyingi changlangan-liklari farqining tozalangungacha bo'lgan changdorligiga nisbati (foizlarda)
Draft inducer	Havo tortish hosil qilgich	Побудитель тяги	Havo o'tkazuvchi quvurda tegishli bosim va havo xarakatini hosil qilish qurilmasi (ventilyator)
Airflow rate	Havo sarfi	Расход воздуха	Vaqt birligi ichida havo o'tkazish quvuridan o'tuvchi havoning hajmi
Siclone	Siklon (changni havodan ajratish uchun qurilma)	ЦИКЛОН	Havo oqimining qurilma devorlari bilan o'zaro harakati tufayli to'g'ri yo'nalishda kelayotgan oqimning to'g'ri aylanma yo'nalishga aylanishi hisobiga, havodan paxta changini ajratish
Siclone station	Siklon qurilmasi	СИКЛОННАЯ установка	Bir yoki bir nechta siklondan va tushirish moslamasidan tashkil topgan qurilma
Filtration plant	Filtrlash qurilmasi	Фильтровальная установка	Havodagi paxta changini ushlab asosiy filtdan iborat bo'lgan uchun qurilmalar majmuasi
Filter	Filtr	Фильтр	Tutish qismlari majmuasidan tashkil topgan, havo oqimining quruq yoki ho'l o'tkazuv to'siqlari bilan o'zaro ta'siri hisobiga havodagi paxta changini tutish qurilmasi
Filter dust capacity	Filtrning chang siqimi	Пилеемкость фильтра	Gidravlik qarshiligi cheklangan qiymatga yetganda filtr tutgan paxta changi massasining filtr ishchi qirqimi birligiga nisbati
Permeability of filter materials	Filtrlash materialining havo o'tkazuvchanligi	Воздухопроницаемость фильтровального материала	Vaqt birligi ichida filtrlash materiali sirti yuzasi birligidan o'tadigan havo miqdori
Dust precipitation chamber	Chang tutish kamerasi	Пилеосадочная камера	Og'irlik kuchi ta'sirida paxta changini tutish uchun qurilma

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