# EFFICIENT DESIGN OF CONICAL DOUBLE DRUM SEPARATOR FOR SEPARATING COTTON SEED RUSHANKA

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**ANNOTATION**
The article provides an analysis of the design features of separators for separating cottonseed rushanka, recommends a design scheme and the principle of operation of an effective two-drum separator for separating cottonseed rushanka.

**Keywords**: Cotton seeds, rushanka, separator, conical, beaters, drum, mesh, step, plates, effect.

## ЭФФЕКТИВНАЯ КОНСТРУКЦИЯ КОНИЧЕСКОГО ДВУХБАРАБАННОГО СЕПАРАТОРА ДЛЯ РАЗДЕЛЕНИЯ РУШАНКИ ХЛОПКОВЫХ СЕМЯН

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**Аннотация:** В статье приводится анализ конструктивных особенностей сепараторов для разделения рушанки хлопковых семян рекомендуется конструктивное схема и принцип работа эффективного двухбарабанного сепаратора для разделения рушанки хлопковых семян.
**Ключевые слова:** Хлопковых семян, рушанка, сепаратор, конический, билы, барабан, сетчатый, шаг, пластинкы, эффект.

## PAXTA CHIGITI RUSHANKASINI AJRATUVCHI IKKI BARABANLI KONUSSIMON SEPARATOR KONSTRUKSIYASINI SAMARADORLIGI

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**Annotatsiya:** Maqolada paxta rushankasini ajratish uchun seperatorlarning konstruktiv xususiyatlari tahlil qilingan, paxta chigiti rushankasini ajratish uchun samarali ikki barabanli separatorning konstruktiv sxemasi va ishlash printsipi tavsiya etilgan.
**Kalit so’zlar:** Paxta chigiti, rushanka, separator, konus, lapatkalar, baraban, to'r, qadam, plastinka, samara.

### Analysis of Design Features of Separators

A seed-weighing machine for the separation of oilseed rolls, consisting of an aspiration device, a sieving device with a receiver, a sieve part and bottoms, and a multi-channel aspiration funnel equipped with a fan and a device for releasing the product, while in order to increase the productivity

and efficiency of core selection, reduce the oiling of husks and huskiness of the core, the aspiration device has an obliquely positioned pneumatic channel with a device for regulating the air tray, and the sieving is provided with a vertical partition, installed under the receiver and dividing the lattice part along the length of the housing into two sections, under one of which additional lattice cloths are installed. [1],

The main disadvantage of this design is the low clarity of separation of the husk from the seed kernel, low productivity of the machine.

A separator for separating cotton seed rolls containing two reciprocating sieve housings, air distributors for blowing air under the sieves located above the latter suction and sedimentary chamber, while in order to increase the efficiency of separation, the separator is equipped with rotating agitators installed inside the suction, and guide canopies fixed in the sedimentary chamber, and the air distributors are made conical with an adjustable longitudinal slit and mounted against the inlet section of the suction of the upper sieve housing from its lower side, at the same time, the lower part of the specified suction has a helescopp landing. [2],

The disadvantage of the known device is the complexity of the design, as well as low performance. In addition, a significant amount of kernel particles, seeds in the waste, leading to a decrease in the separation effect.

Another design of the bitter separator. It consists of two parts: in the first part, in two parallel slowly rotating perforated cylindrical drums, coaxially arranged in the drums by fast-rotating shafts with beals, the core is knocked out of the cut seeds and husks, and in the second part, the core and husk are separated on a concussive sieve. Both main parts of the machine are mounted on a common frame. [3],

The main disadvantage of this separator design is also the low separation effect and low machine performance.

The dielectric separator [4] contains a loading hopper with a feeder, a pitched board and a guide installed with the possibility of feeding the processed material to a dielectric drum, on the surface of which grooves are made along which electrodes in the form of alternating wires of opposite polarity are placed with the possibility of contacting with a cleaning brush, under which a receiver of separation products is installed, while the cleaning brush is made composite in the form of a rubber inner sleeve mounted on the drive shaft and an external sleeve fitted with brushes, and each groove between the electrodes is divided into cells, made in the form of an arc in cross-section along the groove.

The main disadvantage of this device is the low productivity of cotton seed separation, as well as the well-known design does not allow its use for separating cotton seed rolls.

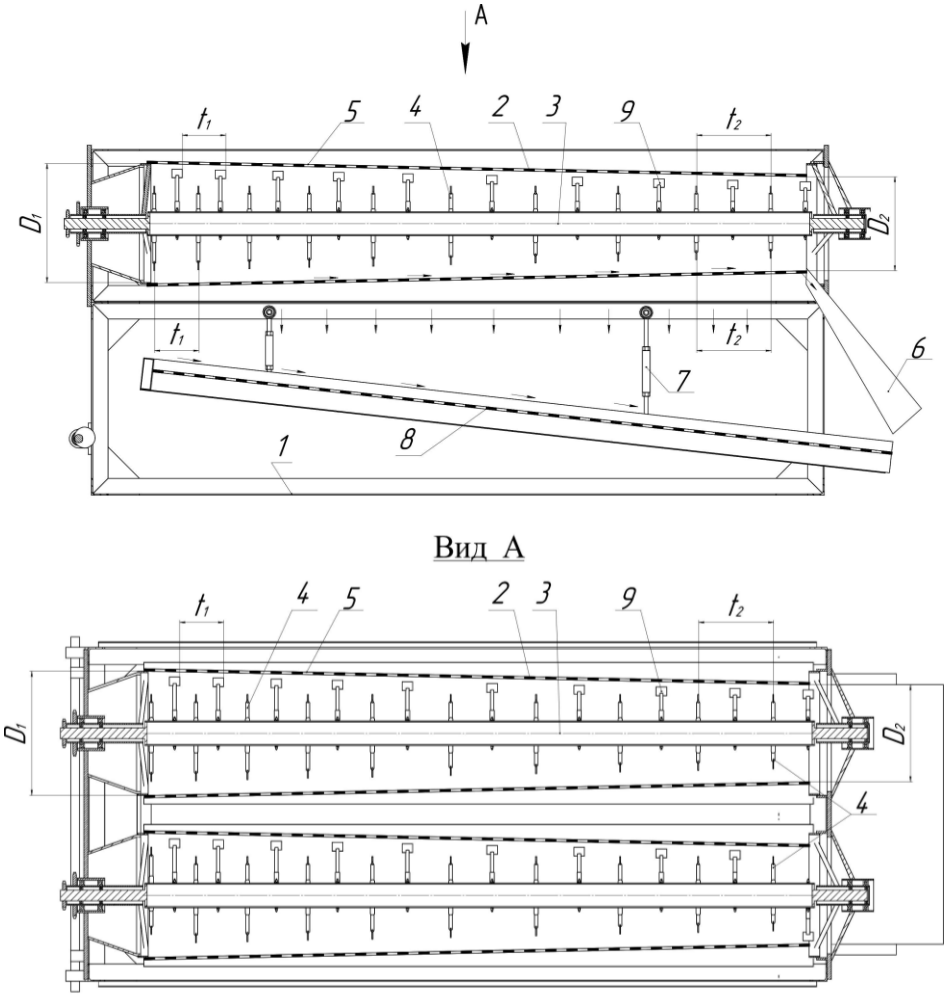
An effective separator scheme. To increase the efficiency of separating cotton seed rolls with high productivity, the design of individual separator elements for separating cotton seed rolls has been improved.

The essence of the design lies in the fact that in the design of the separator for the separation of cotton seed rolls (Bitter separator) containing horizontally mounted two rotating mesh drums, inside which there are bilny shafts with beals attached to them. The bilny shafts are installed eccentrically to the axis of the drums and rotate in the opposite direction. There is a sieve under the drums, under which there is an inclined solid pallet for removing the passage through the sieve from the machine, which moves reciprocally in the direction of the rushank movement. At the same time, the mesh drums are made in the form of a truncated cone, and its large base is located at the beginning of the roll feed. The diameters of the bases of the truncated cone have the ratio: $D_1 = 1{,}3D_2$ (where, $D_1$, $D_2$ - are the

diameters of the large and small bases, respectively). Moreover, the step between the dusty plates during the transportation of the earflaps is made increasing. The ratio of the step between the initial and final bili plates has the ratio: $t_k$=1,3$t_1$ (where, $t_1$,$t_k$ – the step between the bilic plates in the initial zone and the step between the bilic plates in the final zone). This ensures the necessary separation of cotton seed rolls along the entire length of the conical mesh drums. It should be noted that in the course of moving the rushan, their number decreases due to falling through the grids of the divided rushan. In addition, the taper of the mesh drum will effectively transport the remaining rolls due to additional axial force. At the same time, the bills are mounted on the shaft in rows with alternating bilny plates horizontally and vertically. In addition, the holes of the drum grids are divided into three sections, differing in the size of the mesh holes, these hole sizes decrease from the beginning to the end of the drum. It should be noted that the separator drive includes one electric motor and all working bodies receive corresponding movements from a common electric motor.

The gaps between the ends of the bili plates and the mesh drums remain unchanged, since the tops of the bili plates also form a conical surface along the length of the mesh drum.

The design of the separator for separating cotton seed rolls consists of




Conical two-drum separator for separating cotton seed rolls.

and the housings 1, mounted horizontally two rotating mesh drums 2, inside which the bilge shafts 3 pass with the beals 4 fixed on them. At the same time, the bilge plates of the blade 9 are installed longitudinally and transversely with alternating rows on the bilge shafts 3. The mesh drums 2 are made due to a truncated cone. At the same time, along the length of the drum 2, the holes 5 are

allocated in three sections, which differ in the size of the holes, decrease from the beginning to the end of the drums.

$$D_1 = 1{,}3D_2 \quad (1)$$

where, $D_1$, $D_2$- , respectively, the diameters of the larger and smaller base of the mesh drum 2.

At the same time, the bili 9 are mounted on the shaft in 3 rows with alternating bili plates 9 horizontally and along the circumference of the section of the drum 2. The gaps between the ends of the bili plates 9 and the mesh drum 2 are made the same along its entire length, that is, the ends of the bili plates 9 also form the shape of a truncated cone. The step between the dust plates 9 along the length of the shaft 3 is made increasing, and has the ratio:

$$t_2 = 1{,}3t_1 \quad (2)$$

where, $t_1$, $t_2$ – respectively, the step between the bili plates 9 in the initial zone and the step between the bili plates 9 at the end of the shaft 3.

Under the drums 2, a shaking sieve 8 is installed, which performs reciprocating motion by means of levers 7. All the working bodies of the separator receive movements from a single electric motor. There is an unloading tray 6 in the output zone.

The design works as follows. The roll is fed into both drums 2 in parallel. Inside the slowly rotating drums 2 (2ob/min), the rushanki is subjected to the intense action of the plate blades 9 bili 4, at which the core is released from the cotton seeds divided into husking. Considering that the plate blades 9 are deployed at an angle of $40^0$ with respect to the axis of the shaft 3, the roll is transported along the drum 2. It should be noted that due to the mesh drums 2 in the form of a truncated cone, there is an intensive interleaving of the separated rolls along its entire length. In addition, the installation of bill plates 9 with an increasing lever eliminates the sealing of the transported rolls along the length of the drums 2. At the same time, the separation of the rolls in the course of their mixing along the shaft 2 and their falling out through the holes 5 of the nets of the drum 2 occurs intensively, since the number of rolls in the course of their transportation gradually decreases. This leads to an increase in the efficiency of releasing the kernel from cut cotton seeds. The separated core and small husks pass through the holes 5 of the mesh of the drums 2 and fall on the shaking sieve 8, and a large husk comes out of the drums 2. The execution of drums 2 in the form of truncated cones eliminates their face and compaction in all three zones of separation of kernels and small husks through holes 5. That is, in the first zone, larger kernels and husks are allocated, and in the third zone, smaller kernels and husks. The shaking sieve 8 (with an area of 2.7 m2) located under the drums 2 receives reciprocating motion (250 vibrations per minute) from two eccentrics sitting on the main shaft (Fig. not shown) machines.

The peculiarity of separating the kernel and husk on a shaking sieve 8 is that the husk particles, thanks to the pod, interlock into lumps and descend from the sieve 8 further into the husk auger. The core goes through the passage and gets on the pallet, then into the core auger (not shown in Fig.)

The design allows for an increase in efficiency, the released core from the cut into peeling cotton seeds, isolation, and their further transportation in the separator.

**TO CONCLUDE**

Development of the left effective design scheme of a two-drum separator for the separation of cotton seed rolls.

**LITERATURE**

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