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MEASURES TO IMPROVE THE QUALITY OF FLUFF

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Abstract: According to the lint quality improvement plan, the following practical studies were carried out; based on the optimization of the parametrization of the final cleaning of seeds from weed impurities in the new selection mesh device, a new linter design was developed, by establishing a selection, mesh device that works intensively and provides seed cleaning without violating the technological regulations of the linter machine, rational parameters of the new linter were determined and recommended by implementation, as a result, positive economic efficiency was obtained, according to the results of theoretical and practical research and compared with the data of the existing linter and the new projection, mesh linter, with the adaptation, positive conclusions were obtained on the objectivity of the results of the study. The significance of the study's results is determined by the cleaning of seeds over all the surfaces of the mesh vibrating surfaces, as well as by the regularity of the release of weed impurities from the devices.

Keywords: Lint, seeds, plan, regulations, quality, vibrating mesh surface, result, linter, parameter, machine, efficiency.

Introduction. Based on the production of high-quality fiber and lint products from raw cotton grown in our republic and its deep processing, complex measures are being implemented to increase the competitiveness of a wide range of high-quality and low-cost textile and light industrial products. In the new development strategy of Uzbekistan for 2022-2026, among other things, the tasks of "double the volume of production of textile industry products and wide implementation of programs to increase labor productivity in industrial sectors" were set for rapid development of the national economy and ensuring high growth rates. In carrying out these tasks, including preserving the natural properties of cotton fiber produced in the cotton ginning industry and preventing the fiber from going to waste using resource-efficient local technologies.

Even though a lot of research has been carried out on cleaning small impurities from the content of seeds and improving the quality of lint by improving linters, some aspects of this process have not been fully disclosed, in particular, the creation of a technology for effectively extracting small impurities from the content of the seed mass without affecting the technological process during the transfer of seeds from the linter supplier. not sufficiently studied by practical and theoretical aspects, the issues of setting optimal values of parameters of working bodies and influencing factors in the separation of impurities from the composition of seeds have not been fully resolved. In addition, during the cleaning of fluff content from small impurities, it is advisable to install a cleaning device depending on the operating mode of the supplier and the direction of movement of the seeds and to determine its optimal parameters, as well as to study the movement of seeds in the cleaning device and the level of cleaning in depth. Taking into account the above-mentioned tasks, the issue of the more perfect study of the possibilities of introducing technologies that ensure the quality production of fluff products in the enterprise, the development of the construction of dirt cleaning devices, which does not hurt the implementation of the technological process, is currently considered urgent.

Based on the analysis of the process of extracting the impurities contained in fluff, the design of the linter machine with a vibrating mesh cleaning device was developed;

To create the possibility of maximum cleaning of impurities from the seeds in the vibrating net cleaning device, a method of ensuring uniform movement of the seeds has been developed;

In the optimization method, the main input factors that have a significant effect during seed cleaning are determined, and their optimal values that ensure the effective passage of the process are determined;

Taking into account the results of studying the process of cleaning seeds from impurities in the linter machine based on planned experiments, a mathematical-statistical method of evaluating the degree of machine impurity cleaning, economic indicator, and residual impurities was developed.

In many studies, the specific characteristics of cotton seeds are lost through averaging, especially the characteristics of ginned seeds, which makes it difficult to distinguish them by a single aspect. When the seeds are divided into fractions in the currently working seed sorting and cleaning machines, the seeds with fibers sent to the linters are 25-32 mm of residual fibers. is gaining length. It has been pointed out in the research that it is not correct to call these seeds digital (letuchka) and to call them pure seeds.

In the studies conducted by Namangan scientists [6-7], before sending the seeds to the linter, they were divided into fractions by passing them through the holes of the oscillating sorting carriage. The devices used in these studies can separate seeds based on fiber properties in addition to shape and size. Through these studies, devices, and methods have been developed to determine the size of seeds of different fiber types. In the research, 200 pieces of medium and thin fiber cotton seeds were separated, and their dimensions and properties were determined through repeated experiments. (Table 1).

Table 1. The sizes of the seeds depend on the selected varieties of cotton

Selective variety	Sizes of germinated seeds				Fiber content, %
	Length, mm	Diameter, mm	Mass, grams (of 1000 grains)		
S-6524	8.0-12.25	5.5-8.75	138.2		14.2
Namangan-77	7.25-12.3	5.6-9.0	125.8		14.9
Bukhara-102	8.1-10,2	5.1-6.8	117.3		10.2

Studies have been conducted on the position of the centers of gravity based on the size and shape of the seeds, such as seeds with residual fibers at the bottom or tip, and seeds without fibers. Two forms were proposed for calculations - two semicircles on the sides, and a rectangle in the middle. Using the laws of mechanics, the centers of gravity of seeds were determined by their constituents.

First of all, the research was conducted on the effect of friction force. In this case, a one-mass system consisting of fibrous bodies (seed, airfoil) with the same degree of freedom, hitting the surface in the absence of friction is determined by the following equation [8, 9]:

$$m\frac{d^2y}{dt^2}+k\pm F=0 \qquad (1)$$

here $k=cy$, s - coefficient of unity; m is the mass of the piece; F is the force of friction or $F=N\cdot sign\dot{y}$; N is the normal force.

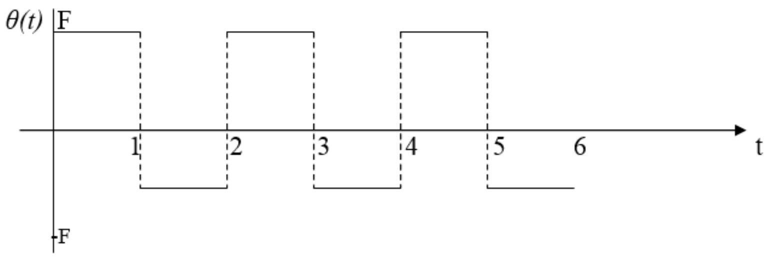
Equation (1) can be written in the following form:

$$M\frac{d^2y}{dt^2}=-cy\pm F \text{ or } \frac{d^2y}{dt^2}+p^2y=\pm F \ (2)$$

Equation (2) can be written in the following form after some substitutions:

$$\frac{d^2y}{dt^2}+P^2y=\theta(t) \qquad (3)$$

In general, the force of friction shortens the sign during the movement. The graph will look like this (Figure 1):



Picture 1. Variation of the magnitude of friction concerning θ(t)

The solution of the equation of motion (3) is solved using integral Laplace transforms

$$y=V_0\cos pt+\frac{y_0}{p^2}\sum_{n=1}^{\infty}\left\{\varepsilon^n(1-\cos(pt-n\pi))\right\} \qquad (4)$$

$$\varepsilon^n=\begin{cases}1 & агар \quad n=1\\ 2 & агар \quad n\geq 2\end{cases}$$

Where r is the angular frequency of specific vibrations; V0 is – the initial speed; u0 is the initial strain.

A second type of model of a piece of cotton is a linear segmented model, the equation of motion of which is expressed as:

$$m\frac{d^2y}{dt^2}+cy=\pm\eta\cdot(\frac{dy}{dt})^2 \qquad (5)$$

This equation can be written in canonical form as:

$$\frac{d^2y}{dt^2}-\Delta\left(\frac{dy}{dt}\right)+P^2y=0 \qquad (6)$$

here $P^2=c/m,\qquad \Delta=\eta/m$ (7)

To solve this equation (7), the solution was sought in series form:

$$y = y_0(t) + \Delta y_1(t) + \Delta^2 y_2(t)... = \sum_{n=0}^{\infty} \Delta^n y_n(t) \qquad (8)$$

and the solution can be written as:

$$y = \xi \cos\omega_\Delta t + \frac{\Delta\xi^2}{6}(3 - 4\cos\omega_\Delta t + \cos 2\omega_\Delta t) - \frac{\Delta^2\xi^3}{72}(48 - 61\cos\omega_\Delta t + 16\cos 2\omega_\Delta t - 3\cos 3\omega_\Delta t) \qquad (9)$$

here

$$\omega_\Delta = \frac{p}{\left[1 + (\Delta^2\xi^2)/3\right]^{1/2}} \qquad (10)$$

(9) In finding a solution Δ^3 we discard the next ones as infinitesimally small. Derivative concerning time was taken from (9) to find the speed of movement of the piece of cotton under the influence of friction force. If the initial conditions are used, then

$$V = V_0\omega_\Delta \sin\omega_\Delta t + \frac{\Delta V_0^2}{6}\omega_\Delta(4\sin\omega_\Delta t - 2\sin 2\omega_\Delta t) - \frac{\Delta^2 V_0^3}{72}\omega_\Delta(61\sin\omega_\Delta t - 32\sin 2\omega_\Delta t + 9\sin 3\omega_\Delta t) \qquad (11)$$

The differential equation of mass movement in a system with several degrees of freedom in nonlinear viscosity is derived from Lagrange's type II equations, and the coefficient of recovery depends on the shock and jump speed. Energy consumption is determined by the interdependence of these speeds. The more mature seeds, the higher the recovery rate. This natural factor is taken into account in the selection of seeds by vibration, and with the help of this it is possible to see that cotton seeds of the same variety differ from each other by their physical and mechanical properties. Depending on the hairiness of the seeds after germination, they have several different values that characterize their frictional properties.

Summary

1) In the new development strategy of Uzbekistan for 2022-2026 in our republic, among other things, on the rapid development of the national economy and ensuring high growth rates: "double the volume of production of textile industry products and widely implement programs to increase labor productivity in industrial sectors".

2) To create technology for effective extraction of small impurities from the composition of the seed mass without affecting the technological process during the transfer of seeds from the linter supplier, and to introduce technologies that ensure quality production of lint products at the enterprise.

3) Based on Lagrange's type II equations, the recovery coefficient depends on the shock and bounce speed. Energy consumption is determined by the interdependence of these speeds. The more mature seeds, the higher the recovery rate.

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