

## DEVELOPMENT OF AN EXPERIMENTAL INSTALLATION WITH A BUNKER- FEEDER AND ITS DESCRIPTION

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### Abstract

In the article, after the ginning process in cotton ginning enterprises, ginned seeds are analyzed. A device is recommended for extracting the seeds that have fiber that can be spun from inside them (non-ginned), and the working scheme and principle of operation of the device are presented.

**Keywords.** cotton, seed, fiber, sorter, mesh surface, fine dirt, lint, fraction, damage, productivity, hairiness.

### Introduction

Analysis of ginned seeds showed that some seeds emerging from the saw gin chamber retained long, stranded fibers attached to them. In addition, the seeds released from gin contain free fiber. The issues of trapping under-ginned seeds and free fiber require theoretical and experimental research. Researchers in their research divides the emerging seeds into three fractions [1-3]:

- a) seeds in which, in addition to the long fibers, part of the down has also been removed, which is manifested by the presence of completely bare areas on the surface of the peel;
- b) seeds that have been normally processed, retaining the downs and not having remnants of long fibers;
- c) seeds unprocessed by saws, with remnants of long fibers in the form of braids of different lengths.

### Practical Research

Our studies mainly focused on the processing of the third fraction, because it has residual fibrousness and represents under-dignified seed. To carry this out, we developed an experimental installation, during the design of which it was decided not to resort to modeling, but to carry out testing on an installation with production parameters. When drawing up programs and developing research, the results of previously conducted research by Central Research Institute of the Cotton Industry and Tashkent Institute of Textile and Light Industry before cotton ginning, as well as other organizations were taken into account.

All experiments were carried out at the Namangan cotton gin plant № 3/4, where the following were manufactured according to our project: a feeder for uniform feeding and an experimental installation for catching under-ginned seeds. All studies were carried out on cotton seeds of grades I and IV, variety Uychi-

2. The experiments were carried out under conditions corresponding to the normal operating conditions of the plant [4-6].

Currently, in the technological process of processing raw cotton, there is no machine for catching under-ginned seeds. We have studied and tested many designs of catchers and sorting machines used in other sectors of the national economy, which are distinguished by very low productivity and catching effect. Most designs have the following elements:

- a) intake pipe;
- b) working chamber - the main part of the catcher, where the process of releasing under-ginned seeds occurs;
- c) a pipe for transporting normally processed seeds;
- d) pipe for seeds of residual fibrous material.

From an analysis of the operation of separators, previously proposed and foreign ones, it was found that it is not possible to use any catcher design as the basis for an experimental study due to their insufficient efficiency. Therefore, a special experimental setup was developed ( Fig. 1 ), which consisted of the following main components; hopper 1, feeder 2, supply inclined tray 3, cone-shaped flange 4, mesh drum 5, scraper 6, helical blade 7, outlet 8, tray for transporting selected seeds 9, mesh carriage 10, elastic elements 11, eccentric shaft 12 with connecting rod 13, a tray for sorting selected seeds 14 and a tray for transporting unginning seeds 15.

Asynchronous electric motor 16, type LOP, with a power of 5.5 kW at 970 rpm for rotating the mesh drum and electric motor 17 for driving the feeder.

The experimental setup works as follows: the seeds coming out of the gin enter hopper 1. Feeder 2 ensures a uniform supply of seeds through tray 3 into the chamber of the mesh drum 4. Inside the drum there are helical blades the seeds are loosened and move in the axial direction. Seeds with normal pubescence fall through the mesh holes and flow down to tray 9 and are transported out through it.

Together with the under-ginned seeds, part of the normally processed seeds exits through hole 8. These seeds arrive on the surface of the inclined mesh 10, which receives an oscillatory movement with the help of an eccentric shaft 12.

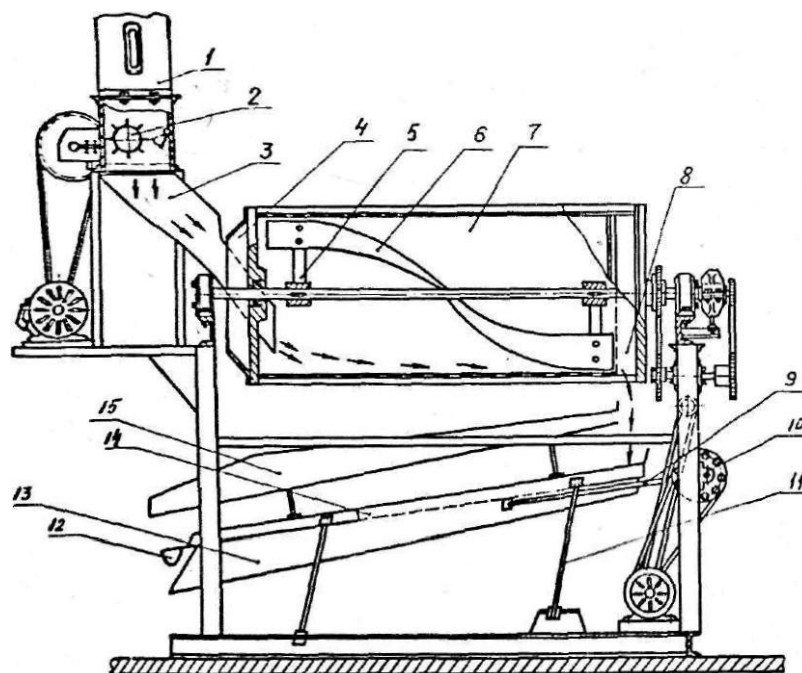


Fig.1. Experimental setup diagram

On the surface of the mesh, during vibration, a layer-by-layer movement of seeds is formed. Unginned seeds with long fibers and raw cotton flakes form the top layer. In the lower layer there are normally processed seeds; moving along the mesh, they fall through the hole, while the under-ginned seeds are in the upper layer, separated from the total mass.

Seeds with normal pubescence are transported along tray 14. Separated unginned seeds and raw cotton flakes are transported using pipeline 15 and re-fed to the gin for subsequent fiber separation.

### Conclusions

In the proposed study, de-fibered seeds are not passed through the first linters full of fiber and seeds that do not require linting due to their fiber content are sent to the proper seed storage warehouses. It is also possible to increase the fiber output by retaining the seeds with fiber and feeding them back to the gin machine.

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