

Analysis of The Storage and Shipping Process of Cotton Raw Material

Igamberdiyev Anvarjon Uktamovich

t.f.f.d., (PhD), Andijan State Technical Institute, Uzbekistan

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Abstract: This article discusses and provides solutions to fire prevention measures during the storage and loading of raw cotton, as well as fire safety rules and solutions for the cotton loading process.

Keywords: Raw materials, pneumatic transport, cotton, air, analysis, humidity, air duct, cleaning, separator.

Introduction:

In cotton ginning plants, the transportation of raw materials from the gins to the cleaning and drying workshops is carried out using air in the pipes of the conveyor device. Its simplicity and the ability to transport the product to designated locations in any complex directions without damage have made the air-powered conveyor device very popular in the cotton ginning industry. It is clear from this that a cotton ginning plant has important functions. [1,2]. In cotton ginning plants, it is considered effective to transport raw materials from the gins to the cleaning and drying workshops using air in the pipes of a conveyor device.

METHODOLOGY

One of the main indicators of an air-powered transport device is its cotton production efficiency. The current air-assisted conveyors used in cotton ginning plants can reach a throughput of 3-6 to 10-12 tons per hour, depending on the condition of the conveyor (mechanical transmission) or the conveyor operator (manual transmission) and the processing machines.

When improving the air transportation process, it is first necessary to take into account the preservation of the original natural properties of cotton.

Cotton ginning plants mainly use a suction-type air-assisted conveyor to transport cotton (Figure 1).

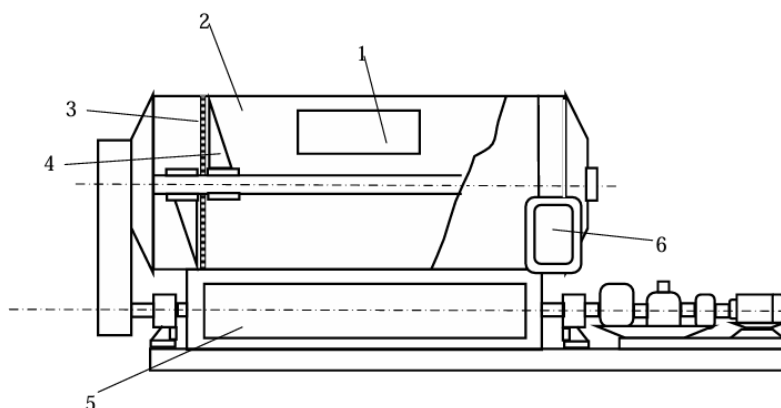


Figure 1. SS-15A separator

It consists of a short inlet pipe (1), a separator chamber (2), a mesh surface (3), a strainer (4), a vacuum valve (5), and an air pipe (6). When the separator is operating, the cotton enters the separation chamber (2) through a short pipe (1) with the air flow. In this chamber, the speed of the cotton decreases, most of it moves straight under the influence of inertial forces and, hitting its wall, falls into the vacuum valve. The remaining part, under the influence of the air flow, adheres to the mesh surface (3). The cotton is separated from the mesh surface by a strainer (4) and fed to a vacuum valve. Small impurities are sucked out by the air flow through a mesh surface using a pipe (6). The effective operation of the separator also depends on the process between the separator and the mesh surface.

RESULTS

Regularly cleaning the mesh surface of the vacuum cleaner will facilitate airflow. Studies have shown that [3,4] cotton wool is observed to form around the suction shaft. The wiper has the ability to clean the stuck part of the cotton on the mesh surface within a radius of 200 mm by rotating it two or three times. The separator is installed in a location close to the fan, depending on the installation location on the air handling unit.

The pressure difference on the separator mesh surface is very large. The principle of operation of the air-assisted conveyor is that, under the flow created by the pressure difference, atmospheric air sucks the transported material into the pipe. The cotton moves in a suspended state inside the pipe and reaches the separator. The separator separates the material from the conveyor using air and transfers it to the processing equipment [5,6].

DISCUSSIONS

The process of treating cotton with air can extinguish the combustible elements, which can be considered a very good thing in production. Air ducts are used to transport the separated air from the separator to the fan and beyond. The suction air duct connects the fan and the separator. The air duct is made of 2-3 mm. tin in the shape of a circle. To reduce air velocity and pressure loss, the pipe diameter is selected around 500-600 mm. Depending on the type of fan, it is selected larger than the diameter of the main pipe [7,8,9]. The smooth operation of vehicles plays a major role in the smooth operation of an enterprise. When designing a master plan, proper design of the road for transport and passengers will have a positive impact on creating all the amenities on the territory of the enterprise. When designing all major buildings and workshops, it is necessary to ensure that they can

be easily accessed, for example, by firefighting vehicles. Typically, the width of the road for motor vehicles according to technical standards should be 6.0; 6.5 or 7.5 meters [10].

CONCLUSION

The transportation of cotton raw materials requires the effective use of technology. It is also important to do the work quickly and efficiently. It is considered appropriate to carry out all of these activities while strictly adhering to safety regulations. When carrying out these activities, it is also necessary to be able to choose technologies that work with air.

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