WAYS TO IMPROVE THE EFFICIENCY OF AIR SEPARATION OF COTTON IN A COTTON SEPARATOR

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Annotation: The article deals with the problems of reducing damage during pneumatic transportation of raw cotton and its extraction from air. The analysis of the movement of cotton particles in the working chamber of the separator, which is one of the main devices in the pneumotransport system used in the transportation of cotton raw materials, was studied.

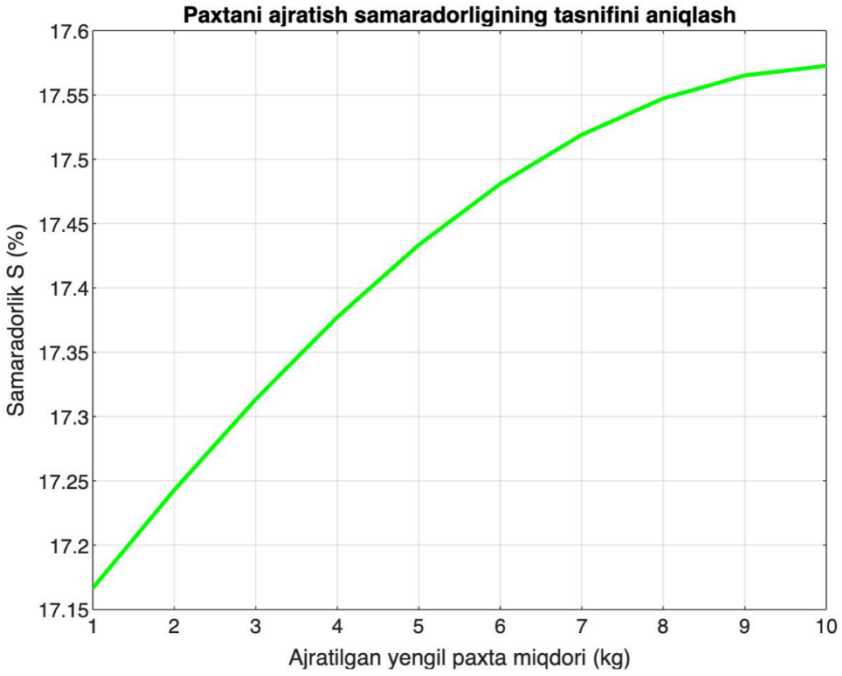
Key words: separator, pneumotransport, cotton lump, fiber, transfer pipe, working chamber, bunt, air flow.

Cotton cleaning in the industry cotton separators cotton separation and in cleaning important role plays. Cotton in separators cotton air flow using separation process his/her divorce efficiency determiner main factor This process is efficiency increase not only cotton quality improve, maybe working release process further effective possible to do creates.

Cotton separator work principle. Cotton separators of cotton light and heavy parts separation for air from the stream uses. Air flow of cotton light parts (for example, cotton) (dust) is heavier parts and down Cotton every one type for air flow speed and direction optimization efficiency to increase help gives.

Air through separation process main formula

Cotton separation efficiency description for The following formula is used.



[S = frac{m_ 1}{ m_1 + m_2}]

Here:

- (S) — separation efficiency (in percent),
- (m _1) — separated of cotton mass amount (light) cotton),
- (m _2) — unsorted (heavy) cotton amount.

Separator efficiency increase for (m _1) maximum to the level to deliver need.

Air flow and separation efficiency. Air flow and separation efficiency between relationship in the calculation, air speed and of cotton weight important factors as seen. Air flow (V) and of cotton features into account to take for The following formula is used:

[V = sqrt{ frac{g cdot d cdot (m_1 - m_2)}{ C_d }}]

Here:

- (V) — air of the flow speed,
- (g) — to the ground pull force (9.81 m/s^2),
- (d) — cotton density,
- (m _1, m_2) — separated and unallocated cotton amount,
- (C _d) — cotton aerodynamic resistance coefficient.

Air speed (V) at the optimal level when separation efficiency maximum will be.

Cotton in the separator separation efficiency increase roads

1. Air of the flow speed optimization:

Cotton separation efficiency increase for air of the flow speed optimization important. If the air If the speed is low, it is light. parts enough does not rise and separation efficiency If the speed decreases if it increases, it is heavy cotton is also air with together rise it is possible, this and separation process Reduces the optimal speed. determination for above from the formula use possible.

2. Cotton features into account to get

Cotton type, density and structure air flow through to separate impact If cotton dense and heavy if, air flow through separation efficiency decreases. Such in cases air of the flow speed increase necessary.

3. Separator design improvement:

Separator design of cotton to be separated big impact shows the separator. internal structure improvement (e.g., air of the flow corner and speed setting (separation) efficiency increases.

4. Automated systems current to:

Cotton in separators automated monitoring systems current to grow through air flow real- time parameters in mode management It is possible. This weather optimal flow rate and direction observation and adjustment opportunity gives.

5. Air filtering and cleaning improvement:

Air of the flow effective performance for air cleanliness important role plays. Cotton in the separator air filtering system improvement through air quality improve and separation efficiency increase possible.

5. Cotton in the separator efficiency increase for physics and mathematician models

Air flow through separation process mathematician modeling, separation efficiency to increase help gives. Cotton separation process simulation in doing aerodynamic calculations, weather speed, cotton density and separator design optimization possible. Mathematics formulas optimal air quality speed calculation and efficiency increase for technological approaches working exit possible.

Conclusion

Cotton in separators cotton air through separation efficiency increase, cotton industry working release process effective to do important way is considered. Air flow speed, cotton features and separator design optimization separation efficiency increases. With this together, automated management systems current to grow and air filtering systems improvement separation process quality and efficiency noticeable at the level improves.

In the thesis cited formulas and mathematician calculations using cotton separators efficiency further increase for scientific approaches done increase possible.

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