International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

IJIEMR Transactions, online available on 24th Nov 2020. Link :http://www.ijiemr.org/downloads.php?vol=Volume-09&issue=ISSUE-11

DOI: 10.48047/IJIEMR/V09/I11/21

Title: **ANALYSIS OF COTTON ATTEMPT IN THE FUNACE-BAR ZONE OF PURIFIER**

Volume 09, Issue 11, Pages: 106-113

Paper Authors

Rasulov Ruzimurod Khasanovich, Prof. Mardonov Botir Mardonovich, Doctoral student Norbayeva Dilfuza Voxidovna.

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

ANALYSIS OF COTTON ATTEMPT IN THE FUNACE-BAR ZONE OF PURIFIER

Candidate of textile sciences

Rasulov Ruzimurod Khasanovich,

Prof. Mardonov Botir Mardonovich,

Doctoral student Norbayeva Dilfuza Voxidovna.

Institute of Tashkent Textile and Light Industry.

dilfuza.norboyeva@mail.ru +998917918700

Annotation: In this article in cleaning zone immersion conditions of funace-bars and quantity of cotton product was identified theoretically of purifier. Because of alteration over arrow of funace-bar radius, immersion of funace-bar quantity to production rises.

Key words: purifier, radius of funace-bar, immersion quantity of funace-bars to the cotton, incessant conditions of speed, speed, density, pressure.

Cleaning cotton in purifiers from great pollution commits under shocking-browse affect in funace-bars. Setting funace-bars step, distance between saw drum and funace-bars in purifiers is considered main setting and speed of the stew drum is calculated as chief ascent setting,quality of cleaning of the purifier, wasting cotton pieces, breaking of the cotton-seeds and emerging of free fibers. In order to alternate puring section of the cotton purifier, influence of cotton piece with furnace-bar has been seen.

Technological regulation of recycling cotton production identifies technological step of cleaning fiber material in cotton cleaning companies and structure of needful equipments. In cotton cleaning organizations one of the main technological processes is puring cotton from tiny and massy pollutions and these puring equipments are setted to mainly cleaning and drying-cleaning workshops of cotton cleaning organization.

Shockingly affect takes main place in cleaning module of purifier which cleans cotton from pollution and there cotton pieces are attached to one coordinate according to garniture of saw drum and because of power influence which is at the centre main mass of cotton piece erupts from bottom of the drum and surface of funace-bar interacts at the zone of funace-bar fence. Because of fiber material,pollution and characteristics of funace-bar pollution separates from fiber material and taken to litter through slit.

In the research of A.E.Lugachev pulsation was set for pulsing air stream at the zone of purifier and found that air stream takes chief role in separating pollution from cleaning zone.

Research works which is checking proccess of stroke affect at the zone of cleaning module of cotton from massive pollution is carried from proffesor R.Z.Burnashev. Cinetics of power influence which affects to the process of acting cotton pieces in funace-bar zone was seen from the author and taken some mathematical models which characterizes cleaning process. But because of not being some physical-mechanical parameters enough, during cleaning process influence of fiber material with purifier elements and their digital upshot were not finished.

In the works of X.N.Pardayev, P.N.Borodin and K.K.Muxammedov differential technology of cleaning cotton in the Model ЧХ-5 purifier were proposed and because of decreasing mechanical affects for cotton, we have a chance to save natural physical-mechanical skills of the cotton-seeds, but this technology leads to decrease of the cleaning quality. In the research works which authors experimented that influence to the cleaning quality of layout of funace-bar were studied. According to this, it was mentioned that settling down funace-bars as group is efficient.

In the works of A.E.Lugachev, J.SH.Quriyozov, and B.B.Rustamov choosing alternate zone of throwing cotton pieces to the saw-drum surface was explored. From the experiment we can see that alternating zone of throwing cotton pieces to the saw-drum leads to decrease wasting cotton pieces, because of this we must find possibilities for rising cleaning quality.

Analitical calculating techniques of labour organs for separating cotton from massive pollutions were made by the help of SH.U.Rahmatqoriyev and theoretical and practicals setting of purifier for abridging cotton-seeds injury are well-grounded .

Dynamic and mathematical modells of machine aggregate for purifying ЧХ-5 cotton from massive pollutions are organized by the author.

Ratios which depicts action rule of the cotton piece, and orders of the cotton pieces action were studied analytically.

In the researches of A.Parpiyev, M.D.SHoraxmedova, M.M.Ochilov ratio of reproducing cotton and its components to the comparative composure were studied, connection of the cotton and fiber,the composure of cotton-seed and its cover were checked practically.

In the researchworks of R.V.Korabelnikov and X.I.Ibragimov setting stake purifiers at the beginning of the technological process in order to decrease tangling fibers and injury of the cotton-seeds at the process of cleaning cotton production are recommended.

To analyze the cleaning process as a whole, we assume that the condition of increasing the radii and the distance between the columns are the same by placing the center of the cleaning columns at the same distance from the center of the drum. As the radius of the columns changes along the arc, the distance between them and the drum also changes, so the values of immersion of the columns in the raw material also increase. Using these conditions, we write the equation for each zone, defining the velocity, pressure and density of the raw material in the zones with columns,, in the zones outside it,, (.number of columns):

$$\frac{dv_{2i-1}}{[(p_0B+1)v_0-v_{2i-1}]}=\frac{2[s-s_{i-1}-x_{i-1}+R_0fk)}{a_{2i-1}^2+(s-s_{i-1}-x_{i-1})^2}ds$$

If

$s_{i-1}<s<s_{i-1}+2x_{i-1}$

$$\frac{dv_{2i}}{[(p_0B+1)v_0-v_{2i}]}=\frac{R_0fk}{1-M^2}ds$$

if

$s_{i-1}+2x_{i-1}<s<s_i$

--

$$\frac{dv_{2n-1}}{[(p_0B+1)v_0-v_{2n-1}]}=\frac{2[s-s_{n-1}-x_{n-1}+R_0fk)}{a_{2n-1}{}^2+(s-s_{n-1}-x_{n-1})^2}ds$$

if

$s_{n-1}<s<s_{n-1}+2x_{n-1}$

$$\frac{dv_{2n}}{[(p_0B+1)v_0-v_{2n}]}=\frac{R_0fk}{1-M^2}ds$$

if

$s_{n-1}+2x_{n-1}<s<s_n$

Here $s_i=s_{i-1}+2x_{i-1}$ ($s_0=0$), $x_i=\sqrt{2R_iu_i}$, $a_{2j-1}=\sqrt{2R_{j-1}[h_0(1-M^2)-u_{j-1}}$

The above equations are integrated on the basis of initial condition $v_1(0)=v_0$ and $v_2(2x_0)=v_1(2x_0)$, $v_3(s_1)=v_2(s_1)$ the continuous conditions of velocities.

The calculation process requires the fulfillment of the inequality $M<1$

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

The calculations were performed for a case where there were four columns in the cleaning zone at four values of work efficiency, and the following values , performed $B = 0.001\Pi a^{-1}$, $p_0 = 80\Pi a$, $h_0 = 0.014м$, $L = 1.9м$, $\rho_0 = 40$, $2R_0 = 0.0185м$ $2R_1 = 0.019м$ $2R_2 = 0.0195м$ $2R_3 = 0.02м$,constitute the error range in the use of connection $5\% < \delta < 8\%$. Figures 1-3 show graphs of the velocity (Fig.1), density (Fig.2),and pressure (Fig.3) in the cleaning zone at different values of work efficiency Q.

$u_0 = 0.002м$,

$u_1 = 0.0022$ $u_2 = 0.0024м$

$u_0 = 0.001м$,

$u_1 = 0.0012$ $u_2 = 0.0014м$

$u_3 = 0.0026м$ $u_3 = 0.0016м$

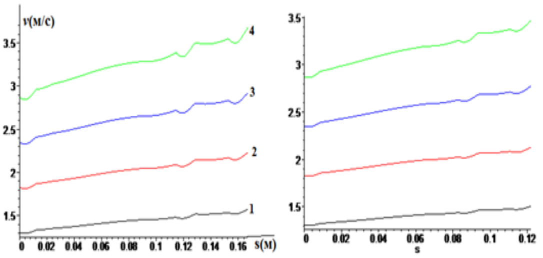


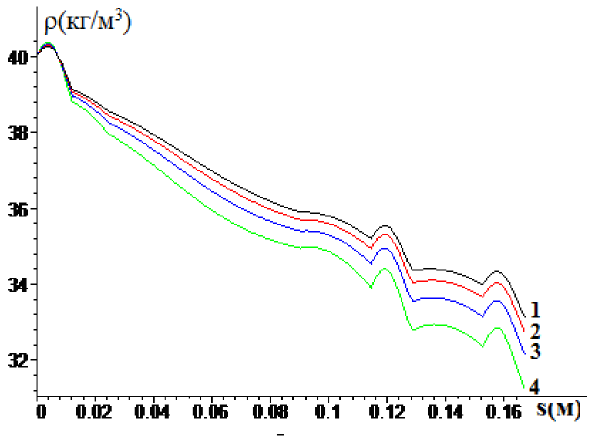
Figure 1. Graphs of distribution of cotton flow rate in the cleaning zone at different values of work efficiency.

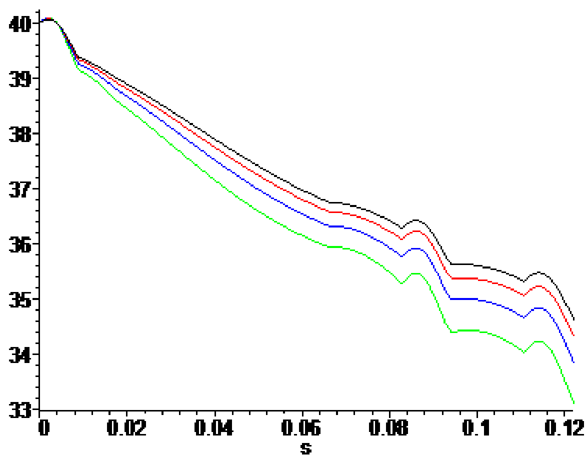
$1 - Q = 5000кг/соат$

$2 - Q = 7000кг/соат$,

$3 - Q = 5000кг/соат$,

$4 - Q = 5000кг/соат$.





International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

Figure 2 Graphs of distribution of cotton flow density in the cleaning zone at different values of work productivity

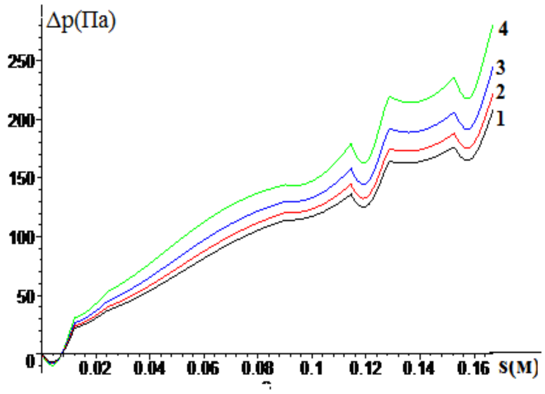
$1-Q=5000$кг/соат

$2-Q=7000$кг/соат ,

$3-Q=9000$кг/соат ,

$4-Q=115000$кг/соат

There are currently no theoretically universal methods for the theoretical study of pollution separation. To determine the amount of contaminants in the fiber ginning machines in the cotton gin and to determine the cleaning efficiency of the machine, A.G. The model was proposed by Sevostyanov [13], and according to this model, the mass distribution of the mass of cotton fiber in the form of particles increases with the interaction of the working bodies of the machine, resulting in the possibility of separation of contaminant particles from its composition. This relationship between the mass and its density differentials dm and $d\rho$ in order to reduce the mass of the particle from which the impurities are separated is proposed.



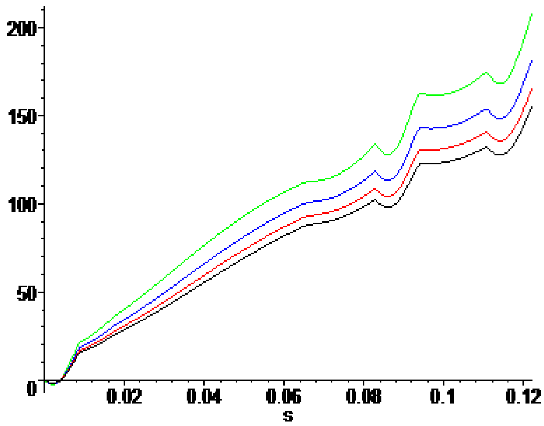


Figure 3 Graphs of the distribution of pressure in the cotton stream in the cleaning zone at different values of operating efficiency.

v $1-Q=5000$кг/соат

$2-Q=7000$кг/соат ,

$3-Q=9000$кг/соат ,

$4-Q=11000$кг/соат .

$$\frac{dm}{m}=\frac{d\rho}{(1+a)\rho}$$

(1)

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

Here m and ρ the mass and density of the flow, a the coefficient of experimental proportionality. This ratio $\frac{d\rho}{\rho}$ can be taken as a measure of the distribution of a typical fraction. Using Equation (1), we obtain a formula that determines the decrease in mass across the zone.

$$\frac{m}{m_0} = \left(\frac{\rho_0}{\rho}\right)^{\lambda} \quad (\lambda = 1/(a+1))$$

We put this expression in the following view:

$$\varepsilon = \frac{m_0 - m}{m_0} = 1 - \left(\frac{\rho_0}{\rho}\right)^{\lambda}$$

(2)

The flow can be taken as an indicator of pollution removal or the cleaning efficiency of the machine.

The law of distribution of the coefficient in each zone [4] is determined by the following formulas according to the work:

$$\varepsilon = \varepsilon_1(s) = \frac{m_0 - m}{m_0} = 1 - \left(\frac{\rho_0}{\rho_1}\right)^{\lambda}$$

агар $0 < s < 2x_0$

$$\varepsilon = \varepsilon_2(s) == [1 - \varepsilon_1(2x_0)]\varepsilon_{20}(s)$$

агар

$2x_0 < s < s_1$

$$\varepsilon = \varepsilon_3(s) == [1 - \varepsilon_1(2x_0)][1 - \varepsilon_2(s_1)]\varepsilon_{30}(s)$$

агар

$s_1 < s < s_1 + 2x_1$

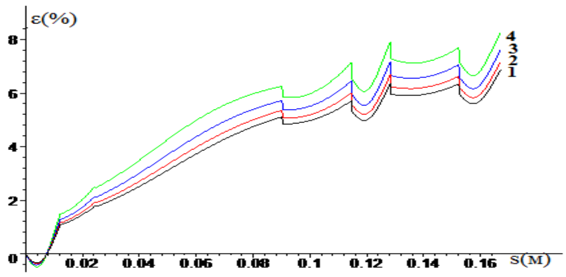
$$\varepsilon = \varepsilon_i(s) == [1 - \varepsilon_1(2x_0)][1 - \varepsilon_2(s_1)][1 - \varepsilon_3(s_2)] \cdots [1 - \varepsilon_{i-1}(s_{i-2})]\varepsilon_{i0}(s)$$

$s_{i-1} < s < s_{i-1} + 2x_{i-1}$ (3)

$$\varepsilon = \varepsilon_n(s) == [1 - \varepsilon_1(2x_0)][1 - \varepsilon_2(s_1)][1 - \varepsilon_3(s_2)] \cdots [1 - \varepsilon_{n-1}(s_{n-2})]\varepsilon_{n0}(s)$$

$s_{n-1} < s < s_{n-1} + 2x_{n-1}$

Бу ерда $\varepsilon_{i0} = 1 - \left(\frac{\rho_0}{\rho_i}\right)^{\lambda}$ $i = 2 \ldots n$



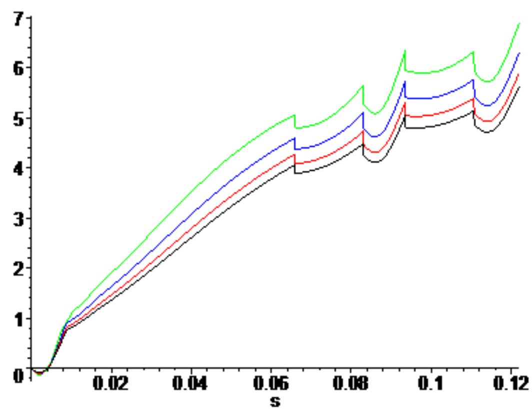


Figure 4 Graphs of the distribution of cleaning efficiency in the cleaning zone at different values of operating efficiency.

$1-Q=5000$кг/соат

$2-Q=7000$кг/соат ,

$3-Q=9000$кг/соат ,

$4-Q=11000$кг/соат

Figure 4 shows the distribution graphs of the cleaning efficiency ε in the cleaning zone, the immersion values of the columns u_i in the raw material, and the distribution of the cleaning arc at different values of productivity Q.

The graphs show an increase in the efficiency factor as productivity increases. From their analysis it can be explained that the cleaning process is not the same as in the zone, in the zones where the columns are located, the raw material is partially condensed, resulting in a decrease in efficiency.

List of used references

1. R.X.Rosulov. Modeling of the process of the interaction between the flyings and the grate. Digest of scientific and technical achievements the realm of cotton industry of the Republic of Uzbekistan 76th Plenary Meeting of the International Cotton Advisory Committee (ICAC) "Cotton in the era of globalization and technological progress" XIII International Uzbek cotton and textile fair, Tashkent-2017. p.173-176.

2. A.E. Lugachev. Development of theoretical foundations of nutrition and cleaning of cotton in relation to the flow technology of its processing. Diss ... doc. those. Sciences-Tashkent: TITLP, 1998-442s.

3. R.Z.Burnashev. Theoretical foundations of raw cotton purification technology .: Author's abstract. diss…. doc. those. sciences - Kostroma .KTI. 1984 - 41p.

4. Kh.N. Pardaev, P.N. Borodin, K.K. Mukhamedov. On the differential technology of cleaning raw cotton in cleaners of the ChKh-5 type. Problems of textiles. - Tashkent, 2004. - No 1 S. 31-33.

6. R.Kh.Rosulov, S.A. Fozilov. Investigation of the influence of the arrangement of grates in the cleaning section of raw cotton cleansing systems on the cleaning effect. Problems of textiles. - Tashkent, 2009 - No 3. S 5-7.

7.A.E. Lugachev, Zh.Sh. Kuriezov, B.B. Rustamov. Investigation of the process and development of a device for fixing raw cotton in a coarse litter cleaner // Problems of textiles. Tashkent, 2003. - No 1 S. 51-53.

8.Sh.U. Rakhmatkariev Dynamic analysis and parametric synthesis of machines with elastic elements and nonlinearities of various origins.

Tashkent, Publishing House "Subject" of the Academy of Sciences of the Republic of Uzbekistan, 1997, 232 pp.

9.Zh.Z. Kholmirzaev. Dynamics of machine assemblies and working body of the CHH-5 cleaner. Auth. thesis ... candidate of technical sciences, Tashkent, 1999, 18 pages.

10.12-15 R.V. Korabelnikov, H.I. Ibrogimov. A comprehensive indicator of the impact of a cotton cleaner on raw cotton during cleaning. Journal of Technology of the Textile Industry, No. 3 (308), 2008, 35-38p.

11.A.G. Sevostyanov, P.A.Sevostyanov Modeling of technological processes. M., Light Industry, 1984, 344 p

2. .