

ISSN 2181-8622

**Manufacturing technology problems**



# **Scientific and Technical Journal Namangan Institute of Engineering and Technology**

INDEX  COPERNICUS  
INTERNATIONAL

**Volume 10  
Issue 4  
2025**



## NamMTI ILMIY-TEXNIKA JURNALI TAHRIR HAY'ATI A'ZOLARI

**Bosh muharrir:** f-m.f.d., prof. O.O. Mamatkarimov

**Bosh muharrir o'rinbosari:** k.f.d., prof. O.K. Ergashev

### TEXNIKA FANLARI (PAXTA, TO'QIMACHILIK VA YENGIL SANOAT)

- |                              |   |  |
|------------------------------|---|--|
| 1. Prof. Dr. Metin ÇOLAK     | – | Ege Universiteti, Turkiya                  |
| 2. Prof. Dr. Suneel KATERIYA | – | Javoharlal Nehru Universiteti, Hindiston   |
| 3. Prof. Dr. Muradov RUSTAM  | – | Namangan To'qimachilik Sanoat Instituti    |
| 4. Prof. Dr. Obidov AVAZBEK  | – | Namangan Muhandislik-Texnologiya Instituti |
| 5. Prof. Dr. Maxkamov ANVAR  | – | Namangan Muhandislik-Texnologiya Instituti |
| 6. Prof. Dr. Azizov SHUXRAT  | – | Namangan Muhandislik-Texnologiya Instituti |
| 7. Dr. Qorabayev SHERZOD     | – | Namangan Muhandislik-Texnologiya Instituti |

### TEXNIKA FANLARI (QISHLOQ XO'JALIGI VA OZIQ-OVQAT TEXNOLOGIYALARI)

- |                                    |   |  |
|------------------------------------|---|--|
| 1. Prof. Dr. Sakina BINTU ABDULLAH | – | Malaya Universiteti, Malayziya             |
| 2. Prof. Dr. Abdalova GULISTAN     | – | Taraz davlat universiteti, Qozog'iston     |
| 3. Prof. Dr. Xudayberdiyev ABSALOM | – | Namangan muhandislik-texnologiya instituti |
| 4. Prof. Dr. Merganov AVAZXON      | – | Namangan muhandislik-texnologiya instituti |
| 5. Prof. Dr. Sherquziyev DONIYOR   | – | Namangan muhandislik-texnologiya instituti |
| 6. Prof. Dr. Qanoatov XAYRULLO     | – | Namangan muhandislik-texnologiya instituti |
| 7. Prof. Dr. Mamatov SHERZOD       | – | Toshkent shahridagi Vebster Universiteti   |

### TEXNIKA FANLARI (MEXANIKA VA MASHINASOZLIK)

- |  |   |  |
|--|---|--|
| 1. Dr. Jaclyn SHARP                      | – | Pittsburg Universiteti, AQSH                     |
| 2. Prof. Dr. Aleksey KAZINSKY            | – | Saratov davlat texnologiya universiteti, Rossiya |
| 3. Akad. Prof. Zaynobbiddinov SIROJIDDIN | – | Andijon Davlat Universiteti                      |
| 4. Prof. Dr. Usmanov PAZLITDIN           | – | Namangan muhandislik-texnologiya instituti       |
| 5. Prof. Dr. Matkarimov PAXRIDDIN        | – | Namangan muhandislik-texnologiya instituti       |
| 6. Prof. Dr. Sharibayev NOSIRJON         | – | Namangan muhandislik-texnologiya instituti       |
| 7. Prof. Dr. Erkaboyev ULUG'BEK          | – | Namangan muhandislik-texnologiya instituti       |

### KIMYO FANLARI (KIMYO VA KIMYOVIY TEXNOLOGIYALAR)

- |                                  |   |   |
|----------------------------------|---|---|
| 1. Prof. Dr. Abel SANTOS         | – | Porto Universiteti, Portugaliya             |
| 2. Prof. Dr. Junli YANG          | – | Lanzhou kimyoviy fizika instituti, Xitoy    |
| 3. Akad. Prof. Namazov ShaFOAT   | – | O'zR FA Umumiy va Noorganik Kimyo instituti |
| 4. Prof. Dr. Botirov ERKIN       | – | O'zR FA O'simlik Moddalar Kimyosi Instituti |
| 5. Prof. Dr. Akbarov HAMDAM      | – | O'zbekiston Milliy Universiteti             |
| 6. Prof. Dr. Nurmanov SUVANKUL   | – | O'zbekiston Milliy Universiteti             |
| 7. Prof. Dr. Salihanova DILNOZA  | – | O'zR FA Umumiy va Noorganik Kimyo instituti |
| 8. Prof. Dr. Kattayev NURIDDIN   | – | O'zbekiston Milliy Universiteti             |
| 9. Prof. Dr. Sulstonov PO'LATJON | – | Geologiya fanlari universiteti              |

### TA'LIMDA ILG'OR PEDAGOGIK TEXNOLOGIYALAR

- |                                |   |  |
|--------------------------------|---|--|
| 1. Prof. Dr. Paul TIKALSKY     | – | Oklahoma Davlat Universiti, AQSH           |
| 2. Dr. David Leffler           | – | Liberty Universiteti, AQSH                 |
| 3. Prof. Dr. Wen-Jian ZHANG    | – | Zhejiang Universiteti, China               |
| 4. Prof. Ergashev SHARIBBOY    | – | Namangan Muhandislik-Qurilish Instituti    |
| 5. Prof. Dr. Musayev JAHONGIR  | – | OFIV                                       |
| 6. Prof. Dr. Eshbayeva ULBOSIN | – | Namangan Muhandislik-Texnologiya Instituti |
| 7. Prof. Dr. Xoshimova DILDORA | – | Namangan Muhandislik-Texnologiya Instituti |

### IQTISODIYOT FANLARI

- |                                  |   |  |
|----------------------------------|---|--|
| 1. Dr. Biral MERCAN              | – | Necmettin Erbakan Universiteti, Turkiya    |
| 2. Dr. Orsolya KATONA            | – | Miskolc Universiteti, Vengriya             |
| 3. Prof. Dr. Soliyev AHMADJON    | – | Namangan Muhandislik-Texnologiya Instituti |
| 4. Prof. Dr. Saidboyev SHERMIRZA | – | Namangan Muhandislik-Texnologiya Instituti |
| 5. Prof. Matkarimov KAMOLIDDIN   | – | Namangan Muhandislik-Texnologiya Instituti |
| 6. Dr. Bustonov MANSUR           | – | Namangan Muhandislik-Texnologiya Instituti |
| 7. Dr. Rashidov RAKHMATILLA      | – | Namangan Muhandislik-Texnologiya Instituti |

Muharrirlar guruhi

O. Kazakov, B. Xolmirzayev, A. Mirzaev, Sh. Maksudov,  
A. Tursunov, O. R. Qodirov (mas'ul muharrir)



**EDITORIAL BOARD OF SCIENTIFIC AND TECHNICAL JOURNAL OF NAMANGAN  
INSTITUTE OF ENGINEERING AND TECHNOLOGY**

**Chief Editor: Prof. Dr. O.O.Mamatkarimov**

**Deputy Editor-in-chief: Prof. Dr. O.K. Ergashev**

**TECHNICAL SCIENCES (COTTON, TEXTILE AND LIGHT INDUSTRY)**

- |                              |   |   |
|------------------------------|---|---|
| 1. Prof. Dr. Metin ÇOLAK     | – | <i>Ege University, Turkey</i>                           |
| 2. Prof. Dr. Suneel KATERIYA | – | <i>Jawaharlal Nehru University, India</i>               |
| 3. Prof. Dr. Muradov RUSTAM  | – | <i>Namangan Institute of Textile Industry</i>           |
| 4. Prof. Dr. Obidov AVAZBEK  | – | <i>Namangan Institute of Engineering and Technology</i> |
| 5. Prof. Dr. Makhamov ANVAR  | – | <i>Namangan Institute of Engineering and Technology</i> |
| 6. Prof. Dr. Azizov SHUXRAT  | – | <i>Namangan Institute of Engineering and Technology</i> |
| 7. Dr. Korabaev SHERZOD      | – | <i>Namangan Institute of Engineering and Technology</i> |

**TECHNICAL SCIENCES (AGRICULTURE AND FOOD TECHNOLOGIES)**

- |                                    |   |   |
|------------------------------------|---|---|
| 1. Prof. Dr. Sakina BINTU ABDULLAH | – | <i>Malaya University, Malaysia</i>                      |
| 2. Prof. Dr. Abdalova GULISTAN     | – | <i>Taraz State University, Kazakhstan</i>               |
| 3. Prof. Dr. Xudayberdiyev ABSALOM | – | <i>Namangan Institute of Engineering and Technology</i> |
| 4. Prof. Dr. Merganov AVAZXON      | – | <i>Namangan Institute of Engineering and Technology</i> |
| 5. Prof. Dr. Sherkuziyev DONIYOR   | – | <i>Namangan Institute of Engineering and Technology</i> |
| 6. Prof. Dr. Kanoatov XAYRULLO     | – | <i>Namangan Institute of Engineering and Technology</i> |
| 7. Prof. Dr. Mamatov SHERZOD       | – | <i>Webster University in Toshkent</i>                   |

**TECHNICAL SCIENCES (MECHANICS AND MECHANICAL ENGINEERING)**

- |   |   |   |
|---|---|---|
| 1. Dr. Jaclyn SHARP                     | – | <i>Pittsburg University, USA</i>                        |
| 2. Prof. Dr. Aleksey KAZINSKY           | – | <i>Saratov State Technical University, Russia</i>       |
| 3. Acad. Prof. Zaynobiddinov SIROJIDDIN | – | <i>Andijan State University</i>                         |
| 4. Prof. Dr. Usmanov PAZLITDIN          | – | <i>Namangan Institute of Engineering and Technology</i> |
| 5. Prof. Dr. Matkarimov PAXRIDDIN       | – | <i>Namangan Institute of Engineering and Technology</i> |
| 6. Prof. Dr. Sharibaev NOSIRJON         | – | <i>Namangan Institute of Engineering and Technology</i> |
| 7. Prof. Dr. Erkaboiev ULUGBEK          | – | <i>Namangan Institute of Engineering and Technology</i> |

**CHEMICAL SCIENCES (CHEMISTRY AND CHEMICAL TECHNOLOGIES)**

- |                                 |   |   |
|---------------------------------|---|---|
| 1. Prof. Dr. Abel SANTOS        | – | <i>Porto University, Portugal</i>                               |
| 2. Prof. Dr. Junli YANG         | – | <i>Lanzhou Institute of Chemical Physics, China</i>             |
| 3. Akad. Prof. Namazov ShaFOAT  | – | <i>Institute of General and Inorganic Chemistry of the ASRU</i> |
| 4. Prof. Dr. Botirov ERKIN      | – | <i>Institute of Chemistry of Plant Substances of the ASRU</i>   |
| 5. Prof. Dr. Akbarov HAMDAM     | – | <i>National University of Uzbekistan</i>                        |
| 6. Prof. Dr. Nurmanov SUVANKUL  | – | <i>National University of Uzbekistan</i>                        |
| 7. Prof. Dr. Salihanova DILNOZA | – | <i>Institute of General and Inorganic Chemistry of the ASRU</i> |
| 8. Prof. Dr. Kattaev NURIDDIN   | – | <i>National University of Uzbekistan</i>                        |
| 9. Prof. Dr. Sultonov POLATJON  | – | <i>University of Geological Sciences</i>                        |

**TA'LIMDA ILG'OR PEDAGOGIK TEXNOLOGIYALAR**

- |                                |   |   |
|--------------------------------|---|---|
| 1. Prof. Dr. Paul TIKALSKY     | – | <i>Oklahoma State University, USA</i>                     |
| 2. Dr. David Leffler           | – | <i>Liberty University, USA</i>                            |
| 3. Prof. Dr. Wen-Jian ZHANG    | – | <i>Zhejiang University, China</i>                         |
| 4. Prof. Ergashev ShARIBBOY    | – | <i>Namangan Institute of Engineering and Construction</i> |
| 5. Prof. Dr. Musaev JAHONGIR   | – | <i>MHESIRU</i>  |
| 6. Prof. Dr. Eshbaeva ULBOSIN  | – | <i>Namangan Institute of Engineering and Technology</i>   |
| 7. Prof. Dr. Xoshimova DILDORA | – | <i>Namangan Institute of Engineering and Technology</i>   |

**IQTISODIYOT FANLARI**

- |                                 |   |   |
|---------------------------------|---|---|
| 1. Dr. Biral MERCAN             | – | <i>Necmettin Erbakan University, Turkey</i>             |
| 2. Dr. Orsolya KATONA           | – | <i>Miskolc University, Hungary</i>                      |
| 3. Prof. Dr. Soliev AHMADJON    | – | <i>Namangan Institute of Engineering and Technology</i> |
| 4. Prof. Dr. Saidboev SHERMIRZA | – | <i>Namangan Institute of Engineering and Technology</i> |
| 5. Prof. Matkarimov KAMOLIDDIN  | – | <i>Namangan Institute of Engineering and Technology</i> |
| 6. Dr. Bustonov MANSUR          | – | <i>Namangan Institute of Engineering and Technology</i> |
| 7. Dr. Rashidov RAKHMATILLA     | – | <i>Namangan Institute of Engineering and Technology</i> |

Editorial team

O. Kazakov, B. Xolmirezayev, A. Mirzaev, Sh. Mahsudov,  
A. Tursunov, O. Kodirov (Executive editor)



# IMPROVING THE EFFICIENCY OF THE GINNING PROCESS TO ENHANCE FIBER QUALITY

MIRZAAKBAROV AZIZBEK

PhD, Namangan State Technical University, Namangan, Uzbekistan  
Phone.: (0593) 490-9090

---

**Abstract:** It has been proven that the increase in the productivity of the gin machine necessarily occurs with an increase in the density of the raw material. However, with an increase in density, the productivity increases up to a certain limit, and then the productivity begins to decrease. In this article, the authors analyze the scientific work carried out to improve the quality of the fiber.

**Keywords:** Cotton, fiber, saw gin, density, colosnik, saw, drum, seed husk, seed, cotton.

---

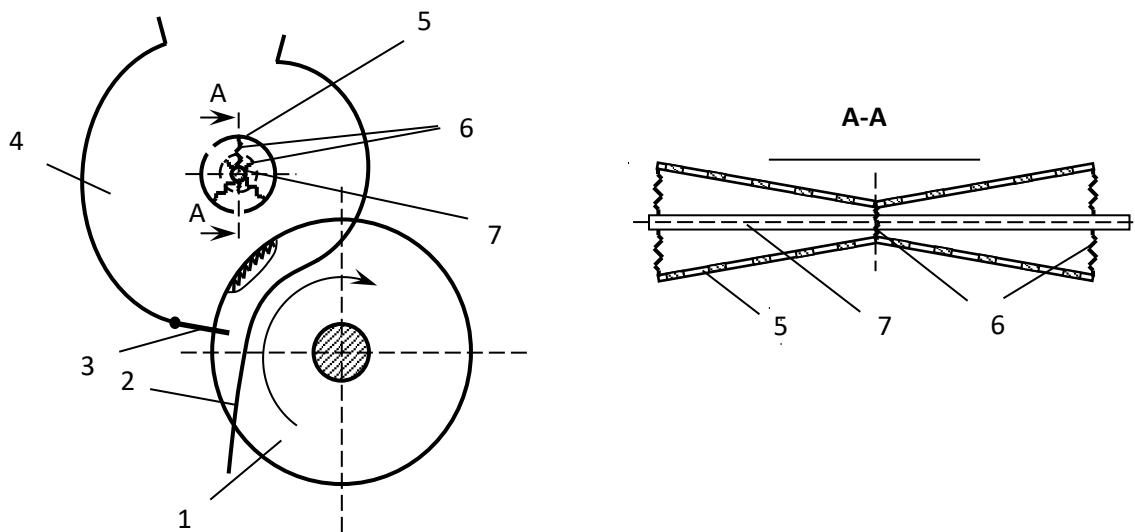
**Introduction.** In ensuring an alternative approach to the ginning process, special importance is attached to studying the motion of the raw material roll, its mechanical properties related to composition, as well as its mechanical state. Certain properties of the raw material roll, including the laws governing velocity distribution on its surface profile, have been analyzed by Miroshnichenko G.I., Tillaev M.T., and others. The structure of the roll represents a complex medium, and its physical and mechanical properties have not yet been sufficiently studied. According to specialists, its structural composition consists mainly of bare or short-fiber cottonseeds, which occupy the inner zone of the roll. In contrast, seed cotton raw material predominantly moves within the outer shell of the roll. Thus, the raw material roll can be regarded as a non-homogeneous medium occupying a cylindrical volume. During ginning, the separation of fiber from the seed occurs under the action of saw teeth. This process takes place in the working chamber and results from the interaction of the saw teeth with the raw material roll and the gin ribs. Fiber separation from the seed is a sufficiently complex process that has not yet been fully investigated, and many of the problems arising in this area have not yet been completely resolved.

In the working chamber of a saw gin, a raw material roll is formed, the state of which has a significant influence on the overall course of the process as well as on the natural properties and quality indicators of the resulting products—fiber and cottonseed—obtained during ginning. The rotation and density of the formed raw material roll depend on the design of the working chamber, the feeding of cotton, and the discharge of cottonseed. Eliminating excessive compaction in the working chamber and improving the quality of the products discharged from it are among the most important tasks. To date, many professors and researchers have proposed various new concepts and approaches for saw gin machines. Based on their studies, numerous new working chamber designs have been suggested in order to bring the density of the saw gin working chamber to an optimal state.

In the new saw gin working chamber proposed by J. S. Ergashev, an additional element is installed in the central part of the raw material roll for the ginning of seed cotton (Fig. 1). This element is mounted longitudinally within the working chamber of the saw gin. It has a cylindrical shape and rotates in the direction opposite to that of the saw cylinder; the element consists of metal and rubber plates attached to a central shaft by means of springs. As a result of installing this additional device, a raw material roll is formed in the working chamber when a certain amount of seed cotton enters it. Owing to the variable diameter of the cylindrical additional

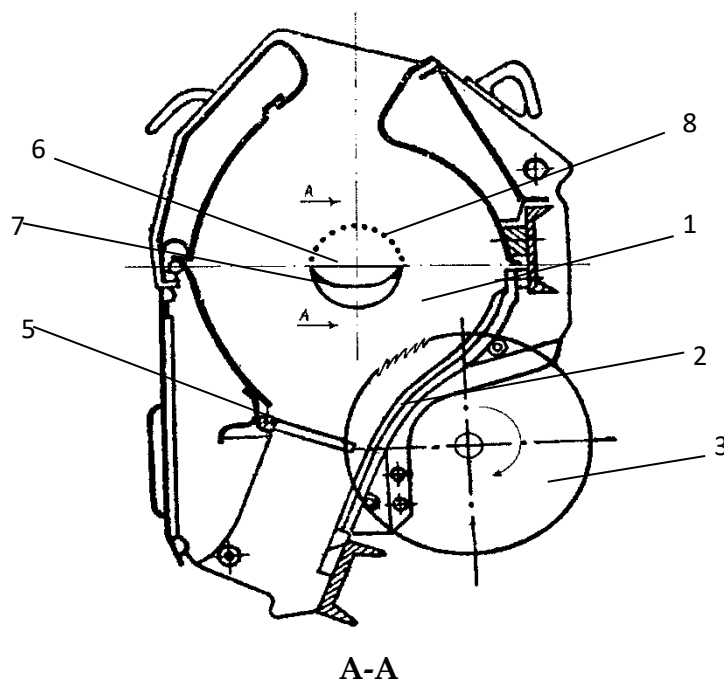
element, its diameter increases when the amount of seed cotton entering the working chamber is small, and decreases when the feed increases, and vice versa [4].

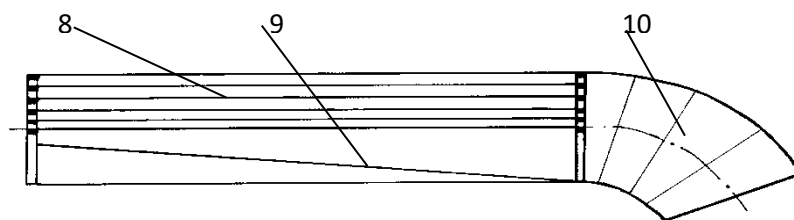
In the course of studies conducted by R. Muradov and co-authors, it was found that cottonseeds separated from the fiber accumulate in the central region of the raw material roll formed in the working chamber during fiber separation (Fig. 2). To remove these accumulated seeds, the authors proposed installing a drum-shaped cylindrical device at the center of the working chamber. The cottonseeds located within the raw material roll pass between rods mounted on an elastic element (base) at the upper part of the drum, then move along an inclined plate and are discharged through a pipe [5].



**Figure 1. Cylindrical drum designed for the removal of cottonseeds**

1 – Saw cylinder; 2 – Gin ribs; 3 – Seed cotton comb; 4 – Working chamber; 5 – Conical mesh drum; 6 – Springs; 7 – Shaft.



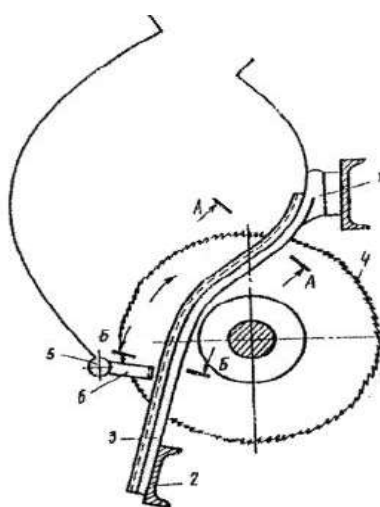


**Figure 2. Cottonseeds in the raw material roll passing through rods mounted on an elastic element (base) at the top of the drum**

1 – Working chamber; 2 – Gin ribs; 3 – Saw cylinder; 5 – Seed cotton comb; 6 – Cylindrical drum; 7 – Elastic element inside the drum; 8 – Rod; 9 – Inclined plate; 10 – Discharge pipe.

The aim of the scientific research conducted by X. T. Akhmedkhodjayev and co-authors is to develop a device that ensures uniform density of the raw material roll and incorporates grooves on the working surface of the gin ribs, thereby allowing cottonseeds separated from the fiber to exit the saw gin working chamber in a timely manner (Fig. 1.4). Cottonseeds separated from the fiber begin to move downward along the surface of the gin ribs under the influence of their own weight. Since the surface of the gin ribs is in contact with the raw material roll, the separated seeds can mix back into the roll without falling downward. In the proposed gin ribs with grooves, the separated cottonseeds fall through the grooves under their own weight [6].

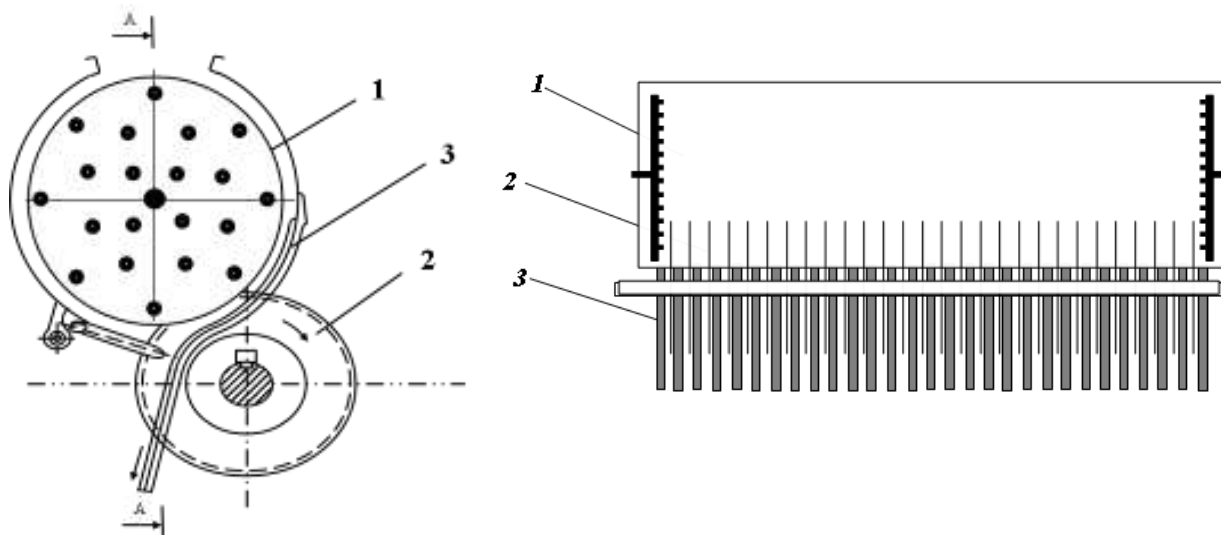
According to the scientific findings of F. B. Ismoilov, the teeth of the saw directly affect the quality and quantity indicators of the complex fiber separation process. Primarily, they influence the retention of fiber clumps, the machine’s productivity, the complete separation of fiber from seeds, the removal of fiber masses from the saw teeth, mechanical damage to fiber and seeds, the formation of defects in the fiber, and energy consumption. By modifying the geometric parameters of the teeth on the saw cylinder—the main working element of the fiber separation machine—Ismoilov proposed increasing the number of saw teeth from 330 to 380 in order to enhance the ability of the teeth to capture fiber during the separation process.



**Figure 3. Working chamber equipped with a saw cylinder having 380 teeth**

1 – Upper beam of gin ribs; 2 – Lower beam of gin ribs; 3 – Gin ribs; 4 – Saw cylinder teeth; 5 – Steel rod; 6 – Seed cotton comb

In the device proposed by R. Muradov and A. Sarimsoqov, the ginning machine is improved to increase productivity by accelerating the rotational movement of the raw material roll. For this purpose, the side section of the saw fiber separator's working chamber rotates around its own axis. Fiber attached to the saw teeth is separated from the seeds through the gin rib grid and begins to move downward under its own weight (Fig. 1.6). Special pins are installed on the surface of the side section to facilitate the movement of the raw material roll [9].



**Figure 4. Accelerators installed on both side sections**

1 – Working chamber with a side section rotating around its axis; 2 – Saw cylinder; 3 – Gin ribs.

**Conclusion.** To date, many professors and researchers have proposed various new ideas and improvements for the saw gin machine. In their studies, they have suggested numerous new designs for the working chamber of the saw gin to optimize its density.

Over the years, the process of separating fiber from seed cotton has rapidly advanced in all countries. The primary goal of these developments has been to preserve the natural properties of both the fiber and the seeds. Based on the review of the four American gins discussed above, the following conclusions can be drawn.

### References

1. G.Jo'raeva, Sh.Komilov, A.Raxmonov, N. Mamadaliyev, "Arrali jin mashinasini ishchi kamerasi zichligini kamaytirish omillari". "Paxta-to'qimachilik klasterlarlarida xomashyoni chuqur qayta ishlash asosida mahsulot ishlab chiqarish samaradorligini oshirishning iqtisodiy, innovasion-texnologik muammolari va halqaro tajriba" mavzusidagi xalqaro anjuman 2-tom 27-28 may 2022 yil
2. Juraeva G.R, Muradov R. M. "The Role and Essence of Information and Communication Technologies in the Processes of Design and Study Gin Saw" Proceeding of the 2nd China-CEECs Symposium on Advanced Fiber Materials, Sept. 24, 2022 Hangzhou, China.

3. Jurayeva G.R, Muradov R. M. "Jin arrasini loyihalash va o'rganish jarayonlarida axborot-kommunikatsiya texnologiyalarining o'rni va mohiyati" Jizzax politexnika instituti "Zamonaviy tadqiqotlar, innovatsiyalar, texnika va texnologiyalarning dolzarb muammolari va rivojlanish tendensiyalari" mavzusidagi Respublika miqyosidagi ilmiy-texnik anjumani 1- qism 2022 yil 8-9-aprel.

4. X.Axmedxodjayev, N. Mamadaliyev, Sh.Komilov, G.Jo'rayeva. "Arrali jin bo'yicha olib borilgan ilmiy izlanishlar tahlili". "Ishlab chiqarishning texnik, muhandislik va texnologik muammolarining innovasion yechimlari" mavzusidagi xalqaro miqyosidagi ilmiy-texnik anjuman 1-qism Jizzax 28-29 oktabr 2022 yil

S. Aslam, N. Soomro "Submissions of Saw Gin Speed on the Quality of Cotton" Sindh University Research Journal (Science Series) Vol 47, No 1, 25-28 (2015)

## C O N T E N T S

### TECHNICAL SCIENCES: COTTON, TEXTILE AND LIGHT INDUSTRY

<b>Saloxiddinova M.</b>	<b>3</b>
Improving the separator design to prevent cotton fiber loss.	
<b>Juraeva G.</b>	<b>9</b>
Optimizing cotton fiber quality during the production process.	
<b>Mamadaliyev F.</b>	<b>16</b>
Analysis of problem in the aerodynamic system of cottonseed linting equipment in cotton processing plants.	
<b>Kozokov S.</b>	<b>23</b>
Conducting experiments with newly designed saw gin ribs in the cotton cleaning process for different cotton varieties.	
<b>Usmonov I., Abdullajonov S.</b>	<b>30</b>
Methods and results for determining the parameters and operating modes of irradiating watermelon seeds with ultraviolet rays.	
<b>Majidov A.</b>	<b>36</b>
Theoretical foundations of the technological parameters of a straight-flow fiber separation device.	
<b>Rahmatova S.</b>	<b>44</b>
Scientific approach to considering properties in the design of garments made from knitted fabrics.	
<b>Rahmatova S.</b>	<b>48</b>
Technology for obtaining knitted fabrics from various raw materials.	
<b>Turaboyev G.</b>	<b>54</b>
Methodology for determining the tribotechnical properties of structural materials interacting with raw cotton.	

### TECHNICAL SCIENCES: AGRICULTURE AND FOOD TECHNOLOGIES

<b>Khurmamatov A., Boyturayev S.</b>	<b>58</b>
Results of industrial water treatment from mechanical impurities.	
<b>Khurmamatov A., Alimardonov Kh., Akhmedova K.</b>	<b>65</b>
Two-stage installation for deep air purification from fine-dispersed solid particles.	
<b>Mamatusmonova D., Mamatov Sh.</b>	<b>73</b>
Technical characteristics of the use of vibrating conveyors for drying rosa caninas.	
<b>Toshboyeva S., Dadamirzayev M.</b>	<b>79</b>
Physicochemical properties of a functional sauce for fish canned products.	

<b>Saribayeva D., Maxmudova D.</b>	
Study of protein–lipid composition in food products.	<b>83</b>
<b>Gulomkhojaeva N., Zokirova M.</b>	
Study of polyphenolic compounds in jujube ( <i>Ziziphus jujuba</i> mill.) grown in Uzbekistan.	<b>88</b>
<b>Gulomkhojaeva N., Zokirova M.</b>	
Investigation of the amino acid composition in black and white mulberry ( <i>Morus nigra</i> l. and <i>Morus multicaulis</i> perr.) varieties.	<b>94</b>
<b>Kadirov A., Vokosov Z.</b>	
New technology for growing microorganisms of the <i>Bacillus</i> sp, <i>Rhizobium</i> sp, <i>Azotobacter</i> sp.	<b>101</b>
<b>Rakhimova G.</b>	
Development of an effective technology for producing soy milk from local soy raw materials, studying its composition and physical and chemical properties	<b>107</b>

## CHEMICAL SCIENCES

<b>Khabibullaev J., Shomurotov Sh.</b>	
Oxidation of various cellulose containing materials using the $\text{HNO}_3/\text{H}_3\text{PO}_4\text{-NaNO}_2$ system.	<b>112</b>
<b>Nuritdinov A., Abdullaev O.</b>	
Technical parameters and energy efficiency of an oil sludge processing unit	<b>122</b>
<b>Okhundadaev A.</b>	
Study of the effect of various factors on the synthesis of vinyl esters of wine acids	<b>127</b>
<b>Usmonova Z.</b>	
Effectiveness analysis of thermally and steam activated plum seed adsorbents	<b>133</b>
<b>Kaxarova M.</b>	
Technological scheme for extracting naphthalene from pyrolysis oil by the extraction (phase separation) method	<b>139</b>
<b>Oribzhonov M., Bektemirov A., Arislanov A., Azizov V.</b>	
Method for producing biosuperphosphate fertilizers containing humic compounds	<b>143</b>
<b>Erkinov R., Soliyev M., Arislanov A.</b>	
Synthesis of sulfur containing organic compounds by reaction of thiol-en and thiol-in	<b>151</b>
<b>Yusupov M., Nuritdinov A.</b>	
Elemental analysis of carboxyl-modified copper phthalocyanine pigment	<b>156</b>

---

<b>Nuritdinov A.</b>	
Thermal analysis of carboxyl-modified cobalt and calcium metal phthalocyanine pigments	<b>162</b>

---

<b>Isakov B.</b>	
Development and study of an anti-caking additive to improve the physico-mechanical properties of ammonium nitrate	<b>168</b>

---

### TECHNICAL SCIENCES: MECHANICS AND MECHANICAL ENGINEERING

---

<b>Gulamova D., Bobokulov S., Eshonkulov E.</b>	
Resistance and voltage anomalies above 200k bscco synthesized by solar technology	<b>173</b>

---

<b>Kutbidinov O., Abdullabekov D., Usmonov D., Xushbakov M.</b>	
Analytical and experimental model for assessing the depreciation rate of transformer oil based on physicochemical factors	<b>182</b>

---

<b>Obidov A., Abdurasulov A.</b>	
Basis of implementation of resource-effective shaft production	<b>188</b>

---

<b>Utaev S.</b>	
Calculation of oil change intervals in diesel-based gas engines	<b>193</b>

---

<b>Isomiddinov A.</b>	
Derivation of differential equations for spindle oscillation in a system of rectangular coordinates	<b>200</b>

---

<b>Dedakhanov A.</b>	
Determination of fuel consumption for drying cotton raw materials	<b>209</b>

---

<b>Atambaev D.</b>	
Difference of the individual yarns in the composition of a wrapped yar on the quality of the yar and determination of acceptable values of the main factors affecting their production	<b>215</b>

---

<b>Rokhmonov D., Sulaymonov J.</b>	
Development of a control algorithm for a smart irrigation system based on soil moisture and meteorological data	<b>224</b>

---

<b>Mamakhonov A., Khikmatillaev I.</b>	
Modeling of a vibratory cleaning device with cosinoidal and sinusoidal shapes in matching the longitudinal and transverse cutting surface	<b>227</b>

---

<b>Soliyev A.</b>	
Theoretical study and characteristics of yarns in the production of circular knit fabrics	<b>239</b>

---

---

**Nomanov M.**

With improved blade mixer results of research work on the development of the 5lp linter **246**

---

**Lastochkin P.**

The influence of carding parameters optimization on the useful time coefficient of a rotor spinning machine **259**

---

**Mirzaakbarov A.**

Improving the efficiency of the ginning process to enhance fiber quality **260**

---

## ADVANCED PEDAGOGICAL TECHNOLOGIES IN EDUCATION

---

**Abdumanonov A.**

Enhancing the methodology for applying intelligent control systems in the teaching of technical sciences **265**

---

**Makhmudov Z.**

Increasing students' activity and knowledge level using test assignments **271**

---

## ECONOMICAL SCIENCES

---

**Sarimsakov B., Mirzabdullayev R.**

The role of contemporary HR technologies in improving business performance **275**

---