



PROCESSES OF THE INDUSTRY ENTERPRISES OPTIMIZATION AND PRODUCT QUALITY IMPROVEMENT

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Annotatsiya. Ushbu maqolada pilla sanoatida qo'llanilayotgan zamonaviy texnologiyalar va ularning ishlab chiqarish jarayonlariga ta'siri tahlil qilinadi. Maqolada pilla sanoatida innovatsion texnologiyalarni joriy etishning ahamiyati, ularning ishlab chiqarish jarayonlarini optimallashtirish va mahsulot sifatini oshirishdagi roli ko'rib chiqilgan. Avtomatlashtirilgan tizimlar, IoT texnologiyalari, sun'iy intellekt va nanotexnologiyalar kabi yangi texnologiyalarni qo'llashning ekologik xavfsizlik, energiya tejamkorligi va resurslardan samarali foydalanish nuqtai nazaridan afzalliklari batafsil yoritilgan.

Kalit so'zlar: Pilla sanoati, innovatsion texnologiyalar, ekologik xavfsizlik, avtomatlashtirish, IoT texnologiyalari, nanotexnologiyalar, barqaror rivojlanish.

Abstract . This article analyzes modern technologies used in the cocoon industry and their impact on production processes. The article considers the importance of introducing innovative technologies in the cocoon industry, their role in optimizing production processes and improving product quality. It also details the benefits of using new technologies, such as automated systems, IoT technologies, artificial intelligence and nanotechnologies, in terms of environmental safety, energy efficiency and efficient use of resources.

Keywords; Staircase industry, Innovative technologies, Environmental safety, Automation, IoT technologies, Nanotechnologies, Sustainable development.

Introduction: Textiles ancient since ancient times his / her own big raw material base - cotton , wool , cocoon , linen , hemp to the fibers has was ' . In particular, cotton was used. The first spinning and weaving were in India as early as the pre-Christian era ,

It is said that it originated in China, Egypt. This is evidenced by a cotton fabric found in Mohenjo-Daro, India, between 3250 and 2750 BC. In addition, the sacred book of the Hindus, Manu (800 BC), also contains detailed information about cotton. The Greek historian Herodotus also wrote in 445 BC that there was a wild tree in India, from which, instead of fruit, beautiful and high-quality wool grew, similar to that obtained from cotton. His thoughts were also confirmed by Nearx, the commander of A. Macedon. The Lapis Lazuli (Lazuli) Road, the Jade Road, the Royal Road, and especially the famous and famous Great Silk Road, which appeared in the years before Christ, were of great importance in the development of textile and light industry in the world. This wave, which began in China in the 2nd century BC and reached the center of Europe, or rather stretched for a distance of 12 thousand kilometers, encompassing dozens of peoples and states, left a deep mark on the historical development of the peoples of the West and the East.

Through this Great Silk Road, the peoples of the East and the West got to know each other, developed political, trade, economic and cultural relations. For example, through this road, cotton from India and Central Asia, cocoons from China, and linen from Europe spread throughout the world. As a result, the need for cotton and silk fibers in the world increased

year by year, because fabrics woven from cotton were more beautiful, elegant, and luxurious than linen and wool, and they were a fabric that protected people from heat and cold.

Some countries, such as Russia, which realized that cotton fiber was more convenient and convenient than other natural fibers, tried to grow it in their own country. For example, during the reign of Tsar Alexei Mikhailovich (1665-1672), cotton was planted in the Astrakhan and Moscow regions and silkworms were raised. However, this did not yield any results. Drawing the right conclusion from this situation, Tsar Peter I stopped growing cotton in the country and gave instructions to develop silkworms in Ukraine and Moldova, and achieved certain successes in this regard.

Later, with the opening of waterways, the construction of railways, and the rapid growth of the world's population, the demand for sails, tarpaulins, sacks, conveyor belts, and other textile products increased, and the demand for natural and artificial fibers, in particular, as noted above, cotton fiber, also increased.

Thus, cotton yarn and fabrics came to Europe from the East in the 17th century. The first cotton processing enterprises on the continent appeared in Lancashire (England). For example, chit came to Holland from Bengal. While the Dutch adopted the Bengali word chit - "gits" as "sits", the Russians adopted it as "sitets" - chit. According to Russian scientists GN Kukin and AN Solovyov, textile products still cannot fully satisfy human needs. For example, on average, 35-40 percent of all fabrics produced on earth are used for clothing, the same amount for household appliances, medicine, bag making and packaging, 20-25 percent for bedding and kitchenware, and in general 60-65 percent for household needs.

Technologies and equipment used in enterprises

The silk industry is an industry that uses various technologies and special equipment to produce high-quality silk. The silk production process is very complex and consists of many stages, and modern technologies and equipment are used at each stage. The following is an analysis of the main technologies and equipment used in the silk industry :

1. The process of growing cocoons

The technologies and equipment used in the cocoon growing process play an important role in improving the quality of raw materials and ensuring production efficiency. Cocoon growing machines: Cocoon growing uses special technologies, such as automated equipment used in the "sericulture" (silk farming) process. These machines automate the drying and care of cocoons, as well as improve the quality of cocoons by applying medicinal substances.

Silkworm rearing systems: In the silkworm industry, silkworms (*Bombyx mori*) are raised in special climatic conditions. For this, *climate control systems and automated "greenhouse systems" are installed. These systems contain special devices to maintain the correct temperature, humidity, and air.

2. Silk extraction process

Various technologies and machines are used in the process of extracting silk from the cocoon, as the quality of this process directly affects the quality of the cocoon. Cocoon processing machines: There are special machines for separating the cocoon from the silk, such as "de-gumming" equipment. With the help of these machines, impurities and other substances can be removed from the cocoon, while maintaining its tissue shape.

2. Silk thread production

The technologies and machines used in the process of producing silk into yarn automate the production process and increase efficiency. Silk yarn twisting machines: Twisting



machines are used to convert silk into yarn. These machines collect silk fibers and weave them into yarn. Modern twisting technologies speed up the process and reduce production costs. Silk yarn drawing and twisting technologies: The spinning machines used to produce silk yarn increase the strength and elasticity of the yarn by drawing and twisting the yarn. These technologies play an important role in improving the quality of the yarn and meeting its special requirements.

3. Silk weaving and fabric making

In the silk industry, the process of weaving fabrics from silk yarn is carried out using special technologies. Weaving machines: Special “automatic weaving machines” are used in weaving silk fabrics. These machines ensure correct and strong weaving of the yarn using advanced technologies, increasing the quality of the fabric. Special pattern-making machines are also used to create fabric patterns during the weaving process. Working with silk fabrics with rollers: The “calendering” and “pressing” machines used in the processing of silk fabrics are used to smooth and shake the surface of the fabric. These technologies make the fabrics beautiful and delicate.

4. Final silk processing process

The final processing of silk is important in improving the quality and product preparation. Silk finishing machines: Silk products are finished with “settling” machines. These machines can improve the condition of the silk fibers, increase the softness of the fabric, and maintain its correct shape.

Advanced drying and sterilization technologies: Silk products undergo advanced sterilization and drying processes. These processes not only improve the quality of the silk, but also ensure its long-term preservation.

5. New technologies and innovations

The introduction of new technologies in the staircase industry helps to make the production process more efficient and improve product quality.

Automation and Robotics: The stair industry is using automation and robotics technologies to reduce the human factor in production processes. These technologies speed up processes, reduce errors, and increase overall production efficiency. Data Analytics and Artificial Intelligence: In the stair industry, new technologies can be used to analyze and optimize production processes. With the help of data analytics and artificial intelligence, processes are monitored in real time, which ensures fast and effective decision-making.

The use of modern technologies and equipment in the staircase industry is important for increasing the efficiency of the production process, improving product quality, and ensuring environmental safety. The introduction of new technologies can make a significant contribution to the sustainable development of the industry.

While studying technologies and conducting scientific research, it should be noted that it was found that the following modern techniques can be used in the "Honey Industry" to improve production and make product quality competitive. These include:



	Name	Task
1	SeriTech (Sericulture Technology)	This system monitors the care of silkworms and optimizes production processes.
2	CET-1000	This system is used to ensure high quality of cocoon fibers and avoid harming the ecosystem.
3	SilkSpinning	This technology speeds up the process of collecting cocoon thread in thread form and increases its efficiency.
4	TwistMaster 3000	This machine improves the quality of the yarns and ensures their strength.
5	AI-OptiTex (Artificial Intelligence in Textiles)	This technology allows for real-time quality checks of cocoons and fabrics, helping to identify any defects and optimize production.
6	EcoSil Dyeing System	This technology ensures that the dyeing of silk fabrics does not harm the environment.
7	BioSilk Technology	This technology is highly durable, environmentally safe, and produced using new biotechnologies.
8	NanoSilk Nanotechnology	This technology enhances the beauty and strength of silk, and creates materials with high antibacterial properties.
9	VertiFar (Vertical Farming System)	This technology ensures year-round cocoon production.
10	GreenSil Waste Treatment System	This technology ensures waste recycling and environmental protection.
11	EcoSpin	This technology can save energy during the production process.

These technologies are modern innovations that can be implemented in the cocoon industry to optimize production processes, improve quality, and protect the environment. Each technology offers its own advantages and increases the competitiveness of the industry.

Conclusion . The introduction of automated systems, artificial intelligence and IoT technologies will make production more efficient and faster. Also, innovations such as environmentally friendly and biodegradable chemicals, new generation silk fibers and nanotechnologies will increase the environmental safety of the industry. With the help of these technologies, not only production processes will be optimized, but also the negative impact on the environment will be reduced.

In addition, the use of new technologies creates opportunities for efficient use of energy and resources, reduction of production costs and ensuring environmental sustainability. Modern technologies in the staircase industry not only improve product quality, but also contribute significantly to the sustainable development of the industry.

In the future, the widespread implementation of these technologies will create opportunities for the industry to increase its global competitiveness, open up new markets, and make it more sustainable and environmentally friendly. Therefore, the need for innovative technologies in the cocoon industry will continue to grow, making the future of the industry bright and sustainable.

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