

THE EFFECT OF AUTOMATION IN MECHANICAL ENGINEERING ON DIFFERENT PROCESSES

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Abstract: This article discusses the importance of automation in mechanical engineering and its impact on technological processes. In addition, there is talk about the dependence of automation on various processes in mechanical engineering.

Keywords: technological process, production, mass production, assembly process, digitally controlled devices.

INTRODUCTION

In the era of automation and mechanization, technical education has become relevant. In the 22nd century, Western engineering experts realized this need, and the field of automation began to develop from this period.

MAIN PART

Automation of production is considered one of the main directions of technical policy in our country, and production of products satisfying consumer demand in any production is one of the real problems of the present time. This, in turn, requires the creation of new technological processes and equipment.

Automation of technological processes is the solution to the problems of development of any modern production. This is a very relevant and promising process, especially for mechanical engineering. Because through automation, it is possible to ensure the kinematics and geometric parameters of the work process with accuracy and speed without human intervention.

The main problems of automation in mechanical engineering are the variety of products and the non-continuity of this work cycle. Production in mechanical engineering produces millions of different parts, and the production of each part is related to the implementation of a large number of technological operations. Examples of these include casting, welding, heat treatment, assembly, product quality testing, and continuing these processes.

Through automation, the image of mass production can be greatly enhanced. In mechanical engineering, mass production is only 12%, large-scale production is 17%, and serial and batch production is 71%. As can be seen from these figures, the process of automation in mechanical engineering is much less than manual labor. This makes it difficult to solve the problem of automation in production, because small-scale production requires a flexible, quickly adjustable automatic process control system.

Modernization of existing enterprises of the chemical, food and other branches of industry and creation of new ones envisages the implementation of large-scale works related to solving various issues of automation of production processes. Development of automation systems and direct introduction to production processes is a multi-stage process. It includes scientific research, design and assembly-adjustment works, as well as a set of activities that ensure reliable operation of automation systems during operation.

It requires knowledge of the principles, methods of creating different forms and classes of automatic systems, as well as acquisition of a common technical language that can be clearly and unambiguously exchanged along with work in the field of automation of technological processes.

It should be expressed in a language that is equally understandable for experts who deal with the issues of installation, adjustment and use of automation systems of a logically calculated and technically based system of automation of a technological process. In this case, all specialists should have a unified understanding in the field of providing the automation system being created with tools, implementation of given adjustment laws, methods of assembling tools and automation tools, transfer of impulse and command lines and source lines. How can this be understood in one word, for example, without the direct participation of installers in the process of developing or using a system of workers in assembly work? Such mutual understanding is provided by means of a specially developed technical document, which is called a technological process automation project.

Through automation, we define a new concept, which is digitization.

Digitization is not only based on the search for effective functional solutions, but also serves to meet the growing needs of people. The main requirements for digital management are reliability, technology, standardization, limitation of harmful effects on the environment, and most importantly, economy.

Digital control panels are used in many industries to monitor and control system variables. Basically, it is the basis for the efficient operation of all equipment available in industry, technology and agriculture. Humidity, pressure and temperature are easily controlled variables using an electronic control panel. These panels help businesses save money by controlling predictable behavior. They are essential equipment in compressors, circulating pumps, production systems, engine control panels and refrigeration plants. Also, the use of RDB machines to create various components of mass-produced items in production can simplify the workflow in terms of accuracy, speed and reliability. We know that a lot of waste is generated in mass production. And in the details worked on RDB machines, cost reduction is achieved due to the accuracy of raw materials and less wastage.

In addition, the advantages of using RDB machines are as follows:

1. Manual operation of the machine poses the risk of uncontrollable moving parts. And processing on RDB machines is safe.
2. In order to avoid the human error factors associated with manual operation of the machine, it is necessary to produce the element in one cycle and repeat it quickly on RDB machines.
3. After the RDB machine is carefully programmed and well adjusted, the cutting process is exactly as specified for fast and quality work. After a good result, the machine performs this part with the same accuracy every time.
4. RDB machines can work on several inclined axes at the same time and can even work at an angle.
5. Another advantage of RDB machines is that they have the ability to implement complex control techniques.
6. Physical quantities measured by digital control panels are usually similar. Digital control panels monitor and control the inputs and outputs of these physical quantities.

In addition, the process that plays the main role in mechanical engineering is the assembly process. The assembly process requires manual labor even in gross production conditions and is carried out by highly skilled workers. But it should be mentioned that it is possible to increase productivity by automating this process. The quality of the parts prepared on the automated assembly machines is good, and the quality, speed and productivity of these machines are high.

In the CIS countries, automation covers an average of 7%. First of all, this causes the emergence of new features in the assembly process. They are:

- 1) The complexity of the assembly volume and the need for new style machines in various assembly processes.
- 2) A short time is required during the assembly process.

With the growth of the production series, assembly work begins to require more assembly compounds. This will lead to automation of assembly work and increase in efficiency. Currently, 25-30% of assembly work is mechanized, 5-7% is automated, and the rest is based on manual labor. The main reason for the high consumption of manual labor is the lack of assembly machines and the technological sophistication of this process. Currently, the production of assembly machines and technological equipment and their application are considered one of the urgent tasks.[4]

The quality of the product processed on automated assembly machines is improved compared to the one processed by hand, the productivity of technological equipment increases and manual labor is reduced. Software modules such as "1C", "KOMPAS-3D", "SiteLine", "IFS Applications", "Autodesk" are used to solve the complex problems of automation of mechanical engineering enterprises. In addition, the assembly process can be divided into five classes. These classes are: mechanical assembly, welding and brazing, gluing, magnetic and combination or attachment based on tapping, brazing, welding, reinforcement and pressing.

Conclusion

These processes can be continued a lot, to sum up, automated processes will increase productivity not only in small enterprises, but in all machine-building enterprises. For this reason, we can achieve all our goals by using automated machines.

REFERENCES :

1. SH.N.Fayzimatov. "Avtomatika va ishlab chiqarish jarayonlarini avtomatlashtirish asoslari". Darslik/- Farg'ona:, 2019y. 272b.
2. A.O.Chechuga. "Osobennosti razrabotki texnologicheskix protserrov avtomatizirivannoy i robotizirovannoy sborki". Rossiya
3. G.Y.Sergeevna. "Avtomatizatsiya proizvodstva v mashinostroenii", Texnicheskie nauki/- Rossiya:, 2019y. 6s.
4. Internet sayt <http://www.gemma.ru>
5. Smirnova.Z.V, Vaganova.O.I, Cherney.O.T, Bystrova.N.V and Golubeva.O.V. Kinematik study of the cam mechanism by the method of diagrams.
6. Sherquvat o'g'li Q. B. et al. PO 'LATLARNI ISHLAB CHIQRISHINING ZAMONAVIY USULLARI //БАРҚАРОРЛИК ВА ЕТАКЧИ ТАДҚИҚОТЛАР ОНЛАЙН ИЛМИЙ ЖУРНАЛИ. – 2022. – Т. 2. – №. 4. – С. 26-27.
7. Кадыров Бектош Шеркуватович, & Абдуллаева Шахзода Фармоновна. (2021). СТОЙКОСТЬ ТВЕРДОСПЛАВНОГО ИНСТРУМЕНТА. Eurasian Journal of Academic Research, 1(9), 796–802.
8. ugli, K. B. S. ., kizi, A. S. F. ., Atabaevich, R. A. ., & kizi, A. M. M. . (2022). Methods of Extracting Steel from Cast Iron. *Spanish Journal of Innovation and Integrity*, 5, 27-29.
9. Sherkuvatugli, K. B. ., kizi, A. S. F. ., Atabaevich, R. A. ., kizi, A. U. R. ., & kizi, A. M. M. . (2022). Techniques for Determining the Temperature in the Cutting Area. *European Multidisciplinary Journal of Modern Science*, 5, 353–355.