

Innovation and application of computer technology in mechanical design, manufacture and automation

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Abstract: With the continuous development of computer technology, it is widely used in various fields, which greatly improves the work efficiency, and effectively promotes the development and reform of various industries to a certain extent. In the field of machinery design and manufacturing in our country, because of the late development of our machinery field, machinery manufacturing technology and technology are not mature. However, in this context, the innovative application of computer technology is particularly important. In recent years, the state has paid more and more attention to the development of mechanical design and manufacturing industry, and organically integrated it with computer technology, in order to promote the overall development of the entire industry. In view of this, this paper briefly analyzes the innovative application of computer technology in mechanical design and manufacturing and automation.

Key words: computer technology; Mechanical design and manufacture; automation

Introduction

Mechanical design and manufacturing plays an important role in social construction and national development. With the continuous enhancement of China's economic strength, began to gradually pay attention to and pay attention to the development of mechanical design and manufacturing industry, in 2015 put forward the "Made in China 2025" strategy, requiring vigorous development of mechanical design and manufacturing industry, and actively carry out industrial transformation, from "manufacturing power" to "manufacturing power" to promote. In order to better realize the development of machinery automation and intelligence, China has trained a large number of talents in the field of machinery manufacturing, but also introduced a large number of advanced technical means and foreign experts, and invested a lot of manpower and material resources. Computer technology is the key to the modernization of the industry, each industry want to achieve structural transformation, sustainable and stable development must be in the use of computer technology, which is also applicable to the mechanical design and manufacturing industry. In general, China's computer technology and mechanical design and manufacturing industry integration is still in the initial stage, in the integration process there are still a lot of drawbacks and limitations, such as the lack of new computer technology, resulting in its full role. This machinery manufacturing industry wants to obtain sustainable development in the future, in the fierce market competition to seize a place, we must further optimize and reform computer technology, and the effective integration of its mechanical design and manufacturing, only in this way, can effectively promote the overall development of the field of mechanical design and manufacturing.

I. Analysis of the application status of computer technology in the mechanical design and manufacturing industry

Nowadays, our country has entered the computer age, it is closely connected with our life and production, greatly improve people's living standards, improve the production efficiency of enterprises. With the continuous innovation and development of science and technology in our country, the state attaches great importance to computing technology, and it has made remarkable achievements in various fields. According to the data survey, the proportion of mechanical design and manufacturing industry in China's gross national product continues to increase, the industrial system is gradually improved, and a complete economic chain has been formed between the upstream and downstream. Through the analysis of the application status of computer technology in China's mechanical design and manufacturing industry, it is known that compared with some countries with advanced manufacturing technology, there is still a large distance between China's mechanical design and manufacturing level, but we should also be aware that compared with China's mechanical design and manufacturing level in 2000, we have made great progress. There are still many problems in the application of computer technology in the field of mechanical design and manufacturing, these problems will cause certain limitations to the development of the industry, in this regard, it is necessary to analyze and study these problems, and actively explore solutions, only in this way, can we keep up with the development trend of the international mechanical design industry, and seize the opportunity in today's fierce international competition.

II. Computer technology in different aspects of the application of analysis

1. Analysis of auxiliary functions

Computing technology can provide powerful auxiliary functions, can provide visualization, simulation and other auxiliary functions. With the continuous development and innovation of computer technology, the auxiliary function is becoming more and more powerful, and this technology has been widely used in the field of mechanical design and manufacturing. Through the aid of computer technology, some abstract and difficult to understand mechanical data information can be expressed concretely, so that the staff can better analyze and process according to these specific mechanical data information, so as to formulate effective strategies to improve the production efficiency and quality of products. Visualization function can greatly improve the accuracy of information, can effectively avoid the error caused by

human factors, through this way, improve product quality, but also to a certain extent reduce the workload of personnel, reduce production costs, improve work efficiency. The auxiliary function of simulation can simplify some complex problems, save working time and improve production efficiency. These two auxiliary functions are used in the field of mechanical design and manufacturing, which can greatly promote the development of the industry. In this regard, in order to give full play to the role of computer-aided functions, it is necessary for staff to continue to learn professional knowledge and skills, improve their professional literacy, master relevant technologies, and be able to skillfully use CAD and other software to carry out drawing operations. These drawing software is also of great value and significance to the development of mechanical design and manufacturing industry, which can greatly improve work efficiency in daily work and ensure the clear and specific structure of mechanical design.

2. Simulation technology analysis

Simulation technology is an emerging technology, it plays an important role in the field of mechanical design and manufacturing, playing an important role. In the actual production process, engineers can use the advantages of simulation technology to build three-dimensional models, through this way, can facilitate the staff to carry out comprehensive analysis and research, and find ways to improve, in order to optimize the mechanical design scheme. In addition, through the establishment of a simulation model, some data can be directly displayed, and when analyzing it, the information can be collected, processed and analyzed by relevant means. The 3D model design can provide strong support for the subsequent design work. Therefore, the staff can ensure the accuracy of the data through simulation. The details are as follows: through the query of manufacturing parameters, after grid division, and finally the establishment of simulation products, the staff according to the detailed analysis of simulation products, through careful observation and detailed analysis of the parameters, you can find the problems in product design, and then put forward specific solutions for these problems, so as to ensure the quality of mechanical design products.

3. Technical analysis of numerical control machine tools

CNC machine tool is an important tool in the mechanical design and manufacturing industry, and it is also an important content of the production automation of mechanical products. Through the relevant software data programming, so as to carry out mechanical production and manufacturing. With the development of The Times and the continuous progress of science and technology, automatic programming has gradually become the mainstream trend. In the process of automatic programming, some staff can program through the relevant software mastered by computer technology, so as to design and process some mechanical parts. In recent years, with the continuous development of China's manufacturing industry, CNC machine tool technology by leaps and leaps, plays an important role in the field of mechanical design and manufacturing, plays an important role, which also provides a strong power for the development of China's manufacturing field.

4. Three-dimensional technical analysis

Three-dimensional technology is also a kind of computer technology, it can provide scientific and technical methods for mechanical design and manufacturing, compared with the previous methods, the science and technology provided under the help of three-dimensional technology is more intuitive and specific. Three-dimensional technology in the analysis of mechanical structure and shape has significant advantages, through the use of three-dimensional technology, mechanical products can be fully analyzed the force, size and specific shape, can help staff intuitively find the problems in the process of product design, so as to improve the quality of product design. In addition, the use of three-dimensional technology can also improve the drawbacks of the traditional design process, improve the design quality, reduce the inspection time, simplify and standardize the complex and redundant inspection process, so as to better enhance the product income.

5. Analysis of Internet of Things technology

At present, with the development of computer technology, a new type of Internet technology has been widely used in the field of machinery manufacturing, which has greatly promoted the development of the field of machinery. The Internet of Things technology can supervise the operation of machinery and equipment. The sensor is connected with the equipment, and the performance and parameters of the equipment are collected regularly. The Internet of Things technology can realize the real-time supervision of the operation of the equipment. At the same time, the Internet of Things can also make the remote operation of mechanical equipment become a reality, through the connection of the Internet, engineers can realize the remote control, diagnosis and control of related mechanical equipment, can carry out rapid maintenance and troubleshooting, greatly improve the work effect. At the same time, the Internet of Things technology can also collect a large amount of mechanical equipment information through the sensor, and carry out a detailed analysis of these data, which can achieve accurate maintenance of the equipment and avoid equipment failure. In addition, the Internet of Things technology can also realize the communication and collaborative work between mechanical equipment, improve the efficiency of the production process and resource utilization, and improve the overall production efficiency.

III. The future development direction analysis

1. Intelligence

At present, with the continuous development of emerging technologies such as artificial intelligence and big data, intelligence has become one of the hot words of this era. It has been deeply rooted in the hearts of the people and is widely favored and welcomed by the public. Intelligent technology has been widely used in many fields such as education and medical care, and plays an important role. At the same time, intelligent technology also plays an important role in the future development of mechanical design and manufacturing industry, and is also one of the important foundations for China's transformation from "manufacturing power" to "manufacturing power". Want to improve the level of mechanical design and manufacturing in China, promote the continuous development of the machinery industry, so

that it can better meet the actual needs of people's lives, it is necessary to move closer to the direction of intelligence, actively develop and innovate intelligent technology, and apply it to the machinery industry, so as to achieve the intelligent development of the machinery industry.

2. Economization

The application of computer technology in the mechanical design and manufacturing industry can not only greatly improve production efficiency and product quality, but also save a lot of manpower, material and financial resources for enterprises, reduce production costs and improve enterprise efficiency. This is also an important purpose of applying computer technology to the machinery design and manufacturing industry. In the process of modern machinery design and manufacturing, will use a lot of manpower and material resources, but also need enterprises to invest a lot of money, however, this traditional manufacturing machinery design and manufacturing will be a great loss of resources, but also easy to cause the waste of funds, resources and other aspects. In this regard, the application of computer technology to the mechanical design and manufacturing industry can effectively reduce production costs, so as to fundamentally achieve the economic development of the machinery industry.

3. Miniaturization

Miniaturization mainly refers to some mechanical equipment, under the premise of ensuring that it has the function of use, it is reduced, and at the same time, it will increase its comprehensive performance, improve maintenance and treatment methods, etc. At the same time, miniaturization development can also save a lot of resources and production space. In addition, in the aspect of miniaturization house exhibition, although the current miniaturization development is still in the initial stage, it also points out the direction for the development of China's machinery manufacturing field.

Concluding Remarks

In short, in the new period, with the proposal of China's "Belt and Road" and Made in China 2025, the mechanical design and manufacturing industry has gradually received attention and concern. With the development and application of computer technology, the development of the industry has brought new challenges and opportunities, the machinery manufacturing industry should make full use of the advantages of computer technology, the integration of it with mechanical design, in order to better promote the development of mechanical design industry.

References:

- [1] Yujie Wang. Application of Computer Technology in Mechanical Design, Manufacturing and Automation [J]. Paper Making Equipment and Materials,2023,52(03):102-104.
- [2] Jing Zhang. Practical Application of Computer Technology in Mechanical Design, Manufacture and Automation [J]. Information and Computer (Theoretical Edition),2022,34(18):1-3.
- [3] Siyuan Peng,Penghou Liu. Analysis of Practical Application of Computer Technology in Mechanical Design, Manufacturing and Automation [J]. Machinery Management Development,2022,37(07):332-333+340.
- [4] Jun Yang,Zhiqiang Qian,Xuanhao Yang, etal. Application of Computer Technology in Mechanical Design, Manufacturing and Automation [J]. Wireless Internet Technology,2022,19(07):101-102.
- [5] Qinghua Wang. Technological Innovation and Application of Computer Technology in Mechanical Design, Manufacturing and Automation [J]. Internal Combustion Engine and Accessories,2022(03):236-238.
- [6] Yu Zhang. Application of Computer Technology in Mechanical Design, Manufacture and Automation [J]. Information Recording Materials,2021,22(04):183-184.