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Original Paper

Application of Computer Technology in Mechanical Design and Manufacturing and Automation

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Abstract

The popularization and application of computer information technology has promoted the progress of mankind, from the era of mechanization into the era of information technology. With the development of economic construction, the demand for mechanical equipment and mechanical products continues to increase, computer technology plays an inestimable role in various fields, the machinery industry is no exception, the application of computer technology in the machinery industry to improve the efficiency of production, reduce production costs, and promote the realization of mechanical automation production. This paper analyzes the application of computer technology in mechanical design and manufacturing and its automation.

Keywords

Mechanical manufacturing and its automation, Computer technology, Application analysis

1. Introduction

In the field of mechanical design and manufacturing and automation, computer technology is becoming more and more popular, it promotes the rapid development of the machinery industry and the improvement of quality, improve the effectiveness of the machinery manufacturing industry production, corresponding to save the production cost and manufacturing cycle, a series of improvements to promote China's machinery manufacturing industry at home and abroad to play a huge advantage in competition. In the use of modern computer technology in many areas of improvement is more typical of the integration of electromechanical technology, microelectromechanical operating system.

2. The Current Situation of the Application of Computer Technology in Mechanical Design and Manufacturing and Its Automation

The introduction of computer technology has propelled China's rapid entry into the Internet

information age, and the application of computer technology has promoted the comprehensive development of China's mechanical design and manufacturing and its automation. Our country in the field of high and new technology there is an obvious disadvantage, many countries have been nanotechnology, numerical control technology, laser integration technology and other advanced technologies and traditional mechanical design and manufacturing combination, bridging the gap between the traditional mechanical design and manufacturing. China started late in this regard, for computer applications in its field of research depth and scope is relatively lacking. At present, China's professional education still remains in the mechanical design and manufacturing and automation, and did not combine with computer applications, so the professional and technical personnel who understand computer applications are relatively limited. Lack of comprehensive talent support, to proactively carry out reform and innovation, to change the status quo of China's mechanical design and manufacturing and automation computer applications.

3. Computer Technology in Mechanical Design and Manufacturing and Automation Specific Application Analysis

3.1 The Application of Auxiliary Functions of Computer Technology

In the mechanical design and manufacturing industry, computer aided technology plays a very important role in the design stage, mechanical product design drawings are generally more complex, the traditional manual drawings there is a long drawing time, inefficiency. The use of computer-aided functions in the drawing design software, can largely reduce the complexity of the drawing design work. Computer-aided functions can accurately provide the product structure, size and shape and other data, so that designers quickly and accurately find the problems that exist in the design stage, timely adjustment and revision. The use of computer technology for drawing design, for future re-editing, modification increased convenience, to a large extent, to improve the efficiency of mechanical product design.

3.2 Application of Computer Simulation Technology

Computer simulation technology is a product of the progress of computer visual technology and computer virtual technology, is widely used in mechanical design and manufacturing in the simulation link. Through the drawing software to complete the design model, consider the rationality and feasibility of the design of each system, the use of computer simulation software for simulation. Before the simulation, it is necessary to enter the parameter design page, set the data one by one, and then enter the network division page to delineate the network with high adaptability to the product characteristics, establish the simulation products, and analyze the reasonableness of the various structural designs through the defect index value. Observe and analyze the simulation interface to find out the problems in the product design process, and the relevant management and designers will solve the problems in time and continuously improve the structure. In the actual production of the practical process, to constantly adjust and standardize the production parameters to ensure the accuracy and

functionality of product manufacturing. The use of computer simulation technology to make mechanical design and manufacturing and automation to achieve better results.

3.3 Application of Auxiliary Functions of Computer Technology

Mechanical design and manufacturing and its automation is a cross-field development, in which the problems encountered are unimaginable, and it is also a complicated process, so it is necessary to use the computer's auxiliary technology. Computer-aided technology is the use of computers must be used in the process of a technology, because in all walks of life in the development process, the use of computers and their own industry contrary to each other, so the use of assistive technology can be the contradiction between the two dissolved. Computer-aided technology is simply a computer itself has a common function, in the field of mechanical design and manufacturing and automation, can improve the accuracy of machinery and design above the realizability. These are the steps that must be accomplished to improve economic efficiency. In the manufacture of parts of the machinery industry, computer-aided technology is mainly to analyze the working principle, then on the basis of mechanical principles, reference to the manufacture of mechanical parts, will simplify the steps and improve the accuracy, in the appearance of mechanical products, size, can rely on computer-aided technology to further improve efficiency. Secondly, for the machinery manufacturing industry, the most important thing is undoubtedly to be able to improve their own economic benefits, and the source of economic benefits of the machinery industry is the efficiency of production, with the help of computer-aided technology can reduce unnecessary losses, indirectly improve production efficiency. And for the design of mechanical design drawings, because of the help of assistive technology, so it reduces the design of a large number of checks required.

3.4 Application of Computers in CNC Programming

Computer programming is divided into manual programming and automatic programming. Manual programming is done manually to the various stages of programming; automatic programming is manually combined with the computer, the use of programming CNC language to write and process the program. With the progress of computer technology and the development of CNC systems, China has realized the conversion of CNC and computer language, but the development of computer technology is faster than the development of CNC, so the combination of the two should be used to pay attention to the consistency of the two in order to meet the needs of CNC programming.

3.5 Application of Computers in CNC Machining

In modern mechanical design and manufacturing, the application of some software can speed up the design and processing speed while improving the quality. Mechanical CAD by querying the quality of the entity to achieve the calculation of the quality and volume of machinery or parts. Mold CAD through the integrated application of CAM and CAD to complete the design of complex molds. The application of CAD and CAM in mechanical design can draw and present the model of parts and machinery on the computer, and simulate the assembly of parts according to the characteristics of the machinery, and perfect it through the application of other technologies and processes, simulate the

whole processing, form CNC programs, and realize the output and processing in CNC machine tools.

3.6 Effective Use of 3D Technology

For computer technology, because most of the functions are composed of programs, it cannot directly help the mechanical industry, but the 3D skills derived from computer technology can help the mechanical design and manufacturing industry. Staff can use 3D technology to simulate the mechanical materials of the place to be designed and then observe them from a 3D perspective. This is conducive to making the product planning more reasonable, and to some extent, reduces the time to design samples, and then through the study of 3D technology, you can directly produce products.

4. Prospects and Suggestions for the Development of Mechanical Design, Manufacturing and Automation

4.1 Miniaturization

From the perspective of mechanical design and manufacturing and automation development, it will continue to develop in the direction of miniaturization. Specifically embodied in the following aspects: (1) smaller size. (2) Lower energy consumption. (3) more flexible movement. In the future, in addition to the application of mechanical design and manufacturing and its automation, in other fields, such as the medical field, the technology will also play a role in promoting the development of related fields. From the perspective of mechanical design and manufacturing and automation needs, the research and development of computer technology, to do a good job of efficient and convenient control, so that it can provide effective technical support for mechanical manufacturing.

4.2 Networking

The promotion of network technology can drive the mechanical design and manufacturing industry toward the global market. The application of network technology will promote new design products in a short period of time in the field of the world to promote, application. At the same time, the improvement of the remote operating system will also make the production creation of the machinery design and manufacturing industry more convenient.

4.3 Intellectualization

With the development of mechanical design and manufacturing as well as computer technology, more new ideas and new methods, etc., will be incorporated in the future, making computer technology more intelligent and improving the level of informationization and automation of mechanical production and manufacturing. The application of computer technology, through the simulation of human intelligence, making the machine behavior and inference ability, etc., constantly enhanced, and then make the mechanical design and manufacture of automation and intelligence level is constantly rising. From the actual situation of the current application of computer technology, due to the limitations of supporting equipment and technical standards, hindering the popularization and application of related technologies. Based on this, in order to promote the intelligent development of Industry 4.0, it is necessary to accelerate the research and application of technology and continuously improve the relevant standards.

5. Conclusion

With the development of science and technology, a variety of technologies have begun to be used in various fields of the machinery industry. In the future development process, the whole industry is the need for continuous learning, the use of computer technology is also a huge project, the need for mechanical design in the field of human resources continue to research and discovery, so the field of mechanical design and manufacturing still has a long way to go.

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