Application analysis of intelligent robot numerical control technology in mechanical manufacturing

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Abstract: under the background of the new era, the innovation and development of science and technology promote the development of all fields in the direction of intelligence, integration and informatization. At the same time, the field of mechanical manufacturing has achieved remarkable development results, but there is still room for the improvement of mechanical manufacturing capacity, which can meet people's production and living needs in the end. With the advent of the Internet of things era, the rapid development of science and technology, the emergence of intelligent and digital technology, and plays a vital role in the field of mechanical manufacturing. The wide application of intelligent robot numerical control technology has greatly improved the efficiency and quality of mechanical manufacturing, which can provide basic equipment for the innovation and development of other fields. How to further analyze the application and development of robot numerical control technology in the field of mechanical manufacturing is an important issue for researchers to solve. This paper will carry out in-depth exploration around this issue, in order to provide theoretical reference for researchers.

Key words: intelligent robot; Numerical control technology; Machinery manufacturing; Application analysis

Introduction

With the vigorous development of social economy, the important position of machinery manufacturing industry in the national economic development has gradually become prominent. The development level of machinery manufacturing industry is closely related to the national economic strength. According to the investigation and analysis of the author, the machinery manufacturing industry has made remarkable achievements, and after the introduction of advanced technology, its precision and science and technology have been greatly improved. However, according to the domestic economic development trend, the machinery manufacturing field is still in the key stage of rapid development, and is developing in the direction of small scale, many types, short cycle and fine production. In the process of mechanical manufacturing, each link puts forward higher requirements for the precision of operation. If it is operated manually, errors and mistakes will inevitably occur, which will eventually lead to poor quality of mechanical manufacturing. Based on this, the mechanical field should actively introduce intelligent robot numerical control technology to improve the reliability, accuracy and efficiency of product manufacturing, and ultimately improve the level of mechanical manufacturing.

1. Basic concept of intelligent robot numerical control technology

With the extensive publicity and popularization of network technology, the mechanical manufacturing field can control the production process with the help of computer programming, so as to realize semi-automatic and automatic production, and give full play to the application role of intelligent robots. In the process of practical application, the core idea is that technicians need to rely on advanced technology to detect and measure personality products, and timely collect and sort out data, drawings and other information. Among them, technicians can also use computer programming software to transform relevant data analysis into application programs. After that, the NC equipment in mechanical manufacturing needs to copy and transmit the application program, so that it can be downloaded and used in the intelligent robot, so as to endow the intelligent robot with relevant functions. Finally, technicians need to adjust and control the computer program, so that they can use the intelligent robot numerical control technology to carry out production operations, so as to improve the efficiency and quality of mechanical manufacturing. At the same time, they can also improve the safety and intelligence of the control system, and improve the accuracy and safety of mechanical processing.

2. Advantages and characteristics of intelligent robot numerical control technology

According to the previous application experience, the application of intelligent robot numerical control technology in mechanical manufacturing can effectively improve the product quality and intensive reading. Specifically, in the process of mechanical manufacturing, we can improve the accuracy of mechanical manufacturing with the help of the above advanced technologies, and at the same time, we can also improve the production efficiency of products. For example, in mechanical manufacturing operations, when processing different parts in the same type of work, it needs the help of intelligent robot numerical control technology, which can not only reduce the working time, but also improve the work efficiency. Using this technology in production can accurately adjust the process parameters and improve the process flow, thus simplifying the production process and eliminating redundant links. Based on the traditional mechanical manufacturing mode, different parameters need to be set in advance when processing and producing different products. Based on the traditional mechanical manufacturing process, different products can be processed with the help of processing lathes, in which different indicators and parameters need to be set, but the production needs to be suspended during the adjustment, resulting in the whole production process can not be maintained continuously, which virtually reduces the production efficiency.

3. The development of numerical control technology

The implementation and application of various numerical control technologies can effectively promote the innovation and reform of the

manufacturing industry. At the same time, it also plays a vital role in promoting other industries, such as light industry and medical industry, which are booming under the support of various numerical control technologies. According to the development status of machinery manufacturing, in order to further promote the innovation and development of machinery manufacturing industry, it is necessary to improve the quality and efficiency of product production, and ultimately improve the safety and efficiency of machinery production. For numerical control technology, it also needs to develop in the direction of more intelligence and automation, so that it can pre-warning and avoid adverse hidden dangers on the basis of ensuring production efficiency and quality, and improve the safety of product production. At this stage, the state attaches great importance to the optimization and application of numerical control technology, in which not only the introduction of support policies. It also increased capital investment. At the same time, many domestic universities and vocational colleges have set up specialties and courses related to numerical control technology, aiming to provide high-quality talents with solid professional knowledge, skilled practical skills and outstanding professional quality for the production, maintenance and application of numerical control technology equipment, and ultimately meet the needs of the development of numerical control technology. In general, numerical control technology has a good development prospect, its automation level is constantly improving, at the same time, its efficiency and accuracy are also continuously improving.

4. Application path of intelligent robot numerical control technology in mechanical manufacturing

4.1 Part processing

The extensive application of robot numerical control technology in the field of mechanical manufacturing can effectively improve the processing quality of parts. Specifically, it is generally with the help of sensor type intelligent robot program. In general, mechanical equipment is an important foundation in the manufacturing of industrial production machinery. If it is in a harsh production environment, it needs to be operated manually, but it can not meet the processing requirements. In addition, the application of advanced technology in mechanical manufacturing can meet the needs of automatic and intelligent production and processing. According to the actual production, the sensor type external controlled robot is generally selected, which is controlled by the external computer, and then can complete the operation instructions, display control and information processing. For example, during part processing, the part is a symmetrical rotating metal disc with a radius of 50, and four semicircular grooves need to be dug at the edge of the disc, and the dots should be evenly distributed on the circle. At this time, you can set (50, 25) as the center coordinates of the disc, and control the intelligent robot by adjusting the macro program to realize the parameter processing of the part. When processing parts, it is necessary to set the macro program serial number to XXXX, and mark the center coordinates on the cylinder surface, which can be set to N and m, while the radius of the upper surface of the cylinder is r, and the incremental angle is l, in which the drilling fixed point coordinate is O, the hole depth is x, the number of holes is y, the initial drilling angle is p, and the cutting angle is Q. at this time, it can be adjusted to nmlprqoxyPxxxx, G65 and other macro program statements can command the intelligent robot, and finally complete the NC machining of the same type of products.

4.2 Planning trajectory

Combined with parts processing, it can be seen that parts polishing is an important processing link in mechanical manufacturing, and plays a vital role in the accuracy of parts. In the traditional mode, most parts are polished by manual operation. In this process, not only will there be a high error rate, but also parts will be easily damaged. After the introduction of intelligent robot numerical control technology in machining, the polishing process can be completed under the command of the fixed program, and finally the polishing accuracy can be guaranteed while avoiding parts damage. In the process of practical application, the interactive intelligent robot can also be used to realize the requirements of man-machine dialogue, and finally make the corresponding operation, and carry out the role processing and trajectory planning under the accurate external control. The trajectory of intelligent robot has a direct impact on the accuracy and shape of mechanical manufacturing parts, so it is very important to control the trajectory. For example, in the process of mechanical manufacturing, when relying on intelligent robot numerical control technology for automatic polishing, programmers need to apply the multi axis milling scanning function set by UGCAM software according to CAM software module and automatic polishing system, so as to complete the overall cavity scanning and obtain the cavity surface information. After that, the programmer can give full play to the auxiliary region mapping function, and then can automatically form the complex NC machining path of the cavity surface. It can be seen that programmers and operators can turn to the polishing trajectory with the help of multi axis NC machining trajectory by properly adjusting the parameters of the intelligent robot, and finally can ensure the polishing accuracy.

4.3 Laser measurement

With the rapid development of science and technology, higher requirements are put forward for the accuracy of parts processing in mechanical manufacturing, and the mechanical manufacturing equipment is also developing in the direction of precision and automation. Based on this, the introduction of intelligent robot numerical control technology in mechanical manufacturing production can meet the needs of parts processing. After completing the mechanical manufacturing task, the humanoid task can be completed by relying on the laser measurement technology of autonomous intelligent robot. In this process, there is no need for human intervention by operators and designers, and various humanoid tasks need to be completed in a specific environment. Autonomous robot has outstanding interactivity, openness and autonomy. At the same time, autonomous robot has the functions of driver control, image recognition, sensor data processing and neural network, and has achieved remarkable application results in mechanical manufacturing, which can effectively improve the level of mechanical manufacturing. For example, in the laser measurement of mechanical manufacturing parts, the intelligent robot numerical control technology can be introduced, which can play its image recognition function and sensor data processing function, and finally accurately measure the density, width, length, height and other parameters of the processed parts.

4.4 Offline programming

There are high requirements for off-line operation in the process of mechanical manufacturing. The introduction of intelligent robot

numerical control technology can realize off-line programming function with the help of autonomous robot. The autonomous robot has outstanding adaptability and autonomy, which can meet the requirements of a variety of environments and tasks. Autonomous intelligent robot can automatically identify the surrounding environment, and can adjust its parameters according to environmental changes, so it can deal with various emergency problems. The wide application of this technology in the field of mechanical manufacturing can increase the complexity of work and innovate the processing of CNC machine tools with the help of off-line programming operation. For example, in the process of practical application, the intelligent robot can also design the intelligent robot with the help of auxiliary bending metal plate on the basis of off-line programming and CAD graphic simulation. In addition, the intelligent robot can also be regarded as a simulation processing platform, and a cutting prototype system and processing system can be established to achieve a more ideal processing effect.

4.5 Coal mining machinery

Coal resources are of great significance in industrial production and daily life. With the vigorous development of social economy, it will continue to advance in the direction of urbanization and modernization. At the same time, the demand for coal resources continues to increase, which puts forward higher requirements for coal mining. Because coal resources are mostly buried in deep space, people need to combine geological conditions and other factors to mine, and select the appropriate mining equipment through analysis, and finally achieve good mining efficiency. If the application of intelligent robot numerical control technology in coal mining, it can only extremely improve the performance of mining machine, so as to ensure that the mining efficiency meets the work needs. Traditional mining machines are generally manufactured by welding technology, which has a long production cycle and is difficult to achieve mass production. Intelligent robot numerical control technology can effectively improve the manufacturing efficiency of mechanical equipment, improve the quality of equipment, and provide guarantee for the safe and stable operation of equipment.

Conclusion:

In a word, with the further development of industrial production, artificial intelligence plays a vital role in the field of mechanical manufacturing. The introduction of a variety of intelligent robot numerical control technology has greatly improved the level of mechanical manufacturing. Among them, the extensive application of intelligent robot numerical control technology in mechanical manufacturing can effectively promote the development of intelligence and automation in the field of mechanical manufacturing, and ultimately improve the processing efficiency and quality of parts.

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