ISSN: 1813-4890

Exploring the Development Direction of Machinery Manufacturing and its Automation

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Abstract

Machinery manufacturing and its automation in China's industrial industry continues to develop, the gradual improvement of the level of science and technology in modern society, process theory, and high-tech support, the field of machinery manufacturing has also been able to develop rapidly, towards automation. Machinery manufacturing and its automation development have the advantages of flexibility, high technology content, low processing costs, high security, combined with the current situation of machinery manufacturing and its automation development, to further explore the direction of the development of machinery manufacturing and its automation to tend to network, intelligent, miniaturization, precision, sustainable.

Keywords

Machinery Manufacturing; Advantages; Development Status; Development Direction.

1. Preface

Industrial industry background, machinery manufacturing, and its automation have been widely used in various industry sectors, as a technical complex, involving more professional subject knowledge, in the continuous optimization of science and technology updates, machinery manufacturing and its automation function value is gradually increasing. In terms of the machinery manufacturing industry, traditional machinery manufacturing has higher costs, lower production capacity, and does not meet the new era of technology system development needs and the actual development of the industrial industry. Mechanical manufacturing industry development by the dual role of internal and external, gradually to the intelligent, automated operation system transformation and upgrading, the overall view of this for the enterprise operating efficiency and efficiency is vital to enhance.

2. The Development Status of Machine Building and its Automation

With the gradual improvement of the level of science and technology in modern society, machinery manufacturing and its automation itself are gradually optimized, and the value of its application in various fields of society is gradually revealed. In the traditional mechanical industrial production process, through the practical advantages of machinery manufacturing automation system to optimize the allocation of human resources, through the scientific application of automation technology and CNC technology to achieve mechanical automation, the overall production operation level is high. Combined with the actual production needs on the relevant specified parameters to set, standardize the production of components, speed up the actual production speed, shorten the production cycle, and improve the precision of components, to facilitate the short time to market products, for the sustainable development of enterprises is of great significance. In the process of industrial production and manufacturing, there is often a certain pollution problem, which needs to be avoided through the rational application of intelligent and automatic technology to ensure green and energy-saving industrial production, which is in line with the strategic goal of sustainable development and is

ISSN: 1813-4890

of great significance for national development and social progress. The value of machinery manufacturing and its automation is to provide a carrier for the realization of advanced equipment and intelligent technology, through the application of precision technology and components to ensure the accuracy and reliability of mechanical production and processing, and the chance of error in the process of mass production in the machinery industry has been significantly reduced. Machinery manufacturing operations to promote the need to pay attention to the overall needs of society, step by step optimization of technology and equipment, since the manual mechanical production to semi-automatic mechanized production change, and then to fully automatic intelligent production change, production mode gradually optimize the technology system to upgrade, to assist in the steady development of industrial industries, so machinery manufacturing and automation are seen as a combination of technologies.

The goal of mechanical manufacturing and its automation is clear, that is, the combination of mechanical equipment and automation by means of computer to form a series of advanced manufacturing technology, including CAD (computer-aided design), CAM (computer-aided manufacturing), FMS (flexible manufacturing system) and so on, and finally the formation of large-scale CIMS (computer integrated manufacturing system), so that the traditional mechanical processing to get a qualitative leap. China has gradually increased the technology investment and financial support for the integration of information technology and machining processes to provide an effective carrier, compared with advanced foreign machinery manufacturing systems, China's machinery manufacturing and automation is still in its infancy, in the refinement of processing, China in the manufacture of precision components produced by the error is relatively large.

3. Machinery Manufacturing and its Automation Development has the Advantages

3.1. Flexibility

Compared with traditional machinery manufacturing, automated machinery production methods are more diverse, traditional machinery works more, single production line, and more wasted time. Machinery manufacturing methods to follow the development of the times in the continuous transformation of the ideological concept of fundamental changes in the production and manufacturing process to pay more attention to the convenience of mechanical production, flexibility, to reduce costs in the whole process of manufacturing, improve production efficiency, but also to fully meet the needs of machinery manufacturing for all aspects of heavy machinery, civil industry and other areas of the equipment manufacturing process have applications.

3.2. High Technology Content

As China's economic level continues to rise, science and technology are fully utilized in China, bringing great convenience to the production life of the Chinese people, as well as the machinery manufacturing industry, the traditional backward single production method is gone, so that the manufacturing industry production life becomes diverse. The diversification of production methods provides a variety of possibilities for production technology. The current market competition is very fierce, so not only to ensure product quality but also to do a good job of after-sales service. To a certain extent, this has increased the dependence of machinery manufacturing on automation technology, because, in the process of automated production, it can automatically record the various parameters of the product. Once the product is in the process of using a problem, it can be traced back in time, quickly lock the problem, solve the problem, while the technical content of the product can also be improved. Therefore, automated machinery manufacturing ushered in the spring.

ISSN: 1813-4890

3.3. Reduced Processing Costs

The application of automated mechanical manufacturing processes reduces man-hours and enhances production efficiency. Compared to traditional mechanical manufacturing, a large number of costs and labor are wasted through manual operations, long production times, high commodity prices, and frequent production problems due to human causes. These problems often cause errors in product quality and do not guarantee the accuracy of production. The application of automation technology in the machinery manufacturing process can replace manual labor with machines in the operation of equipment, greatly reducing the manual operation process, effectively solving the time-consuming problem, and ensuring the accuracy of production from the source. For example, the computer-based automated processing technology, which optimizes the industrialized production process, will make the machinery manufacturing present a certain standard under the approval of computer information parameters. At the same time, the cycle of automated production processes manipulation mode can effectively improve product quality. Therefore, the whole link of mechanical design and manufacturing and automation not only reduces the investment of labor costs but also makes the production of products with higher precision and better quality, thus achieving a significant increase in production efficiency.

3.4. Improved Security

Machinery production safety includes not only the safety of the staff themselves but also the safety of product quality. Compared to traditional machinery manufacturing technology, machinery manufacturing and automation technology, machinery instead of manual operation, the use of automated equipment to create production, take a scientific approach to real-time monitoring of the real-time operation of fully automated machinery process, thereby ensuring production safety, reducing the number of accidents, to prevent the emergence of work failure problems. As a result, automated machinery can avoid major staff errors at a certain point in the process. Automated production methods can ensure that all aspects of mechanical facilities work well based on the actual production life, combined with the characteristics of workers' labor, and thus promote the smooth operation of machinery manufacturing production work, which is in line with the safety production standards. In the process of machinery manufacturing work, a variety of unexpected accidents, mechanical failures, and other issues are closely related to the perfection of machinery and equipment manufacturing technology. Therefore, the production process adds a variety of functions such as online monitoring and fault alarms, which greatly improve the safety of equipment operation and also effectively guarantee the safety of operators and reduce unnecessary economic losses for the relevant enterprises [1].

4. The Development Direction of Machine Building and its Automation

4.1. Network Development

The development of networking has led to the continuous improvement of industrial development technology, terminal equipment, remote monitoring technology, etc. are constantly applied to production, which has favorable conditions for the development, production, sales, and after-sales guidance of mechanical automation products. Machinery manufacturing industry development process, the integration of computer information technology, set the internal main control module, through the setting of the docking carrier to meet the information integration line and PCL system docking needs, the working state of the machinery manufacturing system performance for the network. With the support of information within the network architecture, it is possible to build a feedback transmission mode, after setting the relevant working parameters, different institutions within the

ISSN: 1813-4890

equipment to achieve stable operation, operational behavior can generate specific data, automatic comparison of benchmark working parameters, the actual production process parameters of information and benchmark parameters between the large deviation, the internal network information system can automatically diagnose under the operating phase, back to the machine-building system interactive interface Fault diagnosis information, to facilitate accurate analysis and judgment of fault information by technical personnel, scientific development of solutions, and the normal operation of machinery and equipment can be guaranteed. In the process of machine-building mode operation, networking and intelligence play an important role as a carrier [2].

4.2. Intelligent Development

The level of modern science and technology is significantly improved, the development of computer network system advantages can be shown, intelligent technology in various areas of society can be penetrated, based on artificial intelligence system, can be applied in the machinery manufacturing and automation industry, big data technology, mining technology, sophisticated algorithms, etc., machinery manufacturing and automation industry development path has been significantly broadened. In the current development process of machinery manufacturing and automation, computer technology and artificial intelligence play an important role in the field of industrial production, industrial development based on advanced science and technology, some technicians for the development of machinery manufacturing framework, with intelligent control procedures as the core, the implementation of internal information assembly control in the machinery manufacturing industry, linking a variety of types of work mechanisms, through the central processor The value of the system application, coordinated distribution of numerous data and information, the application of different types of individual equipment within the machinery manufacturing system is also ensured. In the actual operation process, the actual needs can be combined with the independent allocation of tasks, optimize the work mode, individual areas applied to the development of intelligent machinery manufacturing system, the effect is significant, the economic cost advantage is obvious, compared with the original machinery manufacturing system, intelligent development has great potential and development space. At present, "private customization" is gradually becoming mainstream, meaning that mechanical design and manufacturing, and automation is developing to intelligent production. From the moment the user places an order, the raw materials and process requirements are fully compliant with the user's requirements. The sale of machine products, especially high-precision machine components, does not mean the end of the entire production process, but rather the continuous collection of data and status of the equipment, and sending it back to the factory. This data is not only useful for the company to analyze the use of the product and to maintain it later. More importantly, these data are relevant to the operation of the entire machine, so they can be used for information services to enable the evolution of industrial models and industrial change [3].

4.3. Miniaturization Development

In the process of industrial development, the development of miniaturization is an important trend. In the process of mechanical production, the traditional mechanical manufacturing work components occupy a large structural space, mechanical equipment has a large volume, space resources consumption is obvious, the development of enterprises is also very easy to be hindered. The miniaturization of mechanical manufacturing and its automation development can be supported by mechanical automation system to ensure that the overall performance remains unchanged, by the proportion of mechanical automation system to reduce the overall equipment size, especially through the application of precision technology, micro science and technology can be penetrated in the mechanical automation industry. Nowadays, micromechanical automation systems develop benignly, and their advantages play an

important role in the field of industrial production, with low energy consumption, high precision, and small size as the main performance, and because of this, they also provide a reliable contribution to the benign development of the industrial industry [4].

4.4. Precision Development

In the industrial industry environment, the machinery manufacturing and processing system have excellent operating and development conditions, in the process of market competition, the quantity is not the decisive factor, the degree of precision of mechanical components plays a decisive role. The current machinery manufacturing compared with the original machinery manufacturing, found that the machinery manufacturing industry is no longer subordinate to the scope of the established mass production, the development of China's machinery manufacturing industry because of the economic and scientific research forces to support the development of good, showing a vertical development trend. It should be noted that in the process of machinery production, to ensure that the mechanical components have a high degree of precision, it is necessary to scientifically define the relevant processes, to ensure the scientific and orderly mode of operation, to obtain reliable data and information, and the subsequent promotion of industrial production has excellent conditions.

4.5. Sustainable Development

The development of machinery manufacturing and its automation, as well as industrial progress, has changed people's traditional manufacturing methods, not only to enrich material life but also to effectively reduce the waste of resources and achieve the protection of the ecological environment, so people call for a return to nature. In this case, the design, use, and manufacture of green products need to ensure that they do not harm the human body as well as the ecological environment, and enhance the utilization of energy. Under the concept of sustainable development, the ecological development of machinery automation will become the mainstream trend. At the same time, the ecological development of mechanical automation refers not only to the mechanical automation products that do not pollute the environment but also have recyclability.

5. Conclusion

With the development of science and technology, machinery manufacturing and its automation is the development trend of the industrial industry, which can reduce costs and improve production efficiency in the whole process of manufacturing, and also fully meet the needs of the manufacturing industry. Therefore, network, intelligence, miniaturization, precision, and continuity have an important role as well as significance in the more detailed study of the development of machinery manufacturing and its automation. In summary, this article mainly analyzes the advantages of machinery manufacturing and its automation development, points out the current situation of China's machinery manufacturing and its automation development and studies the development direction.

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ISSN: 1813-4890

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