Ouhai intelligent lock industry research: taking A company as an example

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Abstract: This paper mainly studies Wenzhou Ouhai intelligent lock industry, taking A company as an example for analysis. From the perspective of the company, the article analyzes the organizational structure of A company and the production process of intelligent locks, and puts forward optimization measures, including production process optimization, equipment upgrading and transformation, personnel training and management as well as quality control and supervision. In addition, the article also analyzes the current situation and development trend of the lock industry from the perspective of the lock industry, and puts forward suggestions on strengthening technological innovation, strengthening brand building and strengthening industrial synergy. By implementing these measures, the production efficiency and product quality of smart locks can be improved, and the healthy development of the industry can be promoted.

Key words: smart lock, production process, industry development

Introduction

In recent years, Wenzhou lock industry has experienced rapid development, is committed to improving product quality, to achieve a successful transformation and upgrading. As early as 2002, Wenzhou lock due to its excellent production scale and output value, won the "China lock capital" reputation. Ouhai District gathered more than 40% of Wenzhou lock manufacturing enterprises, the existing 417 lock and related enterprises. The annual output of intelligent locks exceeds 3 million sets, accounting for more than 75% of Wenzhou output and 23% of domestic production, is a famous lock production base.

Since 2023, the smart door lock market has entered a stage of fierce competition. Although the offline market has fully recovered and its advantages are prominent, the impact of online live broadcasting, promotion and other means on consumers has decreased. During the e-commerce promotion period, the flow dividend was weakened, and the sales volume of products declined. Ouhai intelligent lock enterprises began to force overseas markets, promote the industry to the international, and vigorously promote the lock intelligent transformation process to speed up production efficiency. In the future, enterprises need to actively capture market changes, adhere to scientific and technological innovation and quality-first route, in order to achieve sustainable high-quality development of the industry.

This article to Ouhai leading lock enterprise A company as a starting point, through visits, joint research, joint development and other ways to go deep into the enterprise, study the Ouhai lock industry, to improve the Ouhai lock industry in the country and the world competitiveness to provide help, suggestions.

1. Analysis from the perspective of the company

From the perspective of Company A, the organizational structure of Company A includes: General Manager Office, Production Department, pilot department, Quality Department, Purchasing Department R & D Department, Sales Department, Finance Department, Human Resources Department and Information Department. The production and sales process of smart locks in company A includes the following steps. Design: According to the market demand and technical requirements, design the appearance, function and performance of the smart lock. Parts procurement: According to the design requirements, purchase all kinds of parts and raw materials required for smart lock. Parts manufacturing: Various parts required for the production of smart lock, such as lock core, lock shell, circuit board, etc. Assembly: The production of good parts assembled into a complete smart lock product. Debugging and testing: debugging and testing the assembled smart lock to ensure that the product meets the design requirements and quality standards. Quality inspection: The quality inspection of the smart lock that has passed the debugging and testing is carried out to ensure that the product meets the relevant standards and requirements. Packaging: The smart lock that has passed the quality inspection is packaged, including the outer packaging and internal accessories. Delivery: The packaged smart lock will be sent to the sales channel or directly to the customer. After the investigation of various departments of A company and the analysis of various processes of the company's intelligent lock R & D and manufacturing, the following improvement measures are put forward.

1.1 Production process optimization

It is not difficult to see from the production process of Company A that the production process of smart lock includes raw material procurement, parts processing, assembly, testing, packaging and other links. After analysis and evaluation of the production process, it is found that the following problems exist in the production process:

(1) parts processing process is not fine enough, there are processing errors and waste;

(2) the assembly link has the problem of cumbersome manual operation and low efficiency;

(3) There are problems such as insufficient testing equipment and cumbersome testing process in the test link.

In order to optimize the production process, the following measures were taken:

To improve the process of parts processing, the use of advanced CNC processing equipment and precision measuring instruments to improve the processing accuracy and efficiency. After the improvement, the parts processing error is reduced, and the processing efficiency is improved.

Automatic transformation of the assembly link, the introduction of intelligent assembly lines and robots and other equipment to achieve automatic assembly. After the transformation, the assembly efficiency has been increased by 40 percent.

Information management was carried out on the test link, and a perfect test data management system was established to improve the test efficiency and accuracy.

1.2 Equipment upgrade and transformation

The status quo and technical level of intelligent lock production equipment have a great impact on production efficiency. The smart lock production equipment was evaluated and the following problems were found:

(1) the equipment is aging and the technical level is backward;

(2) the variety of equipment is single, can not meet the needs of multi-variety, small batch production;

(3) the degree of automation of the equipment is low, some processes are purely manual operation, complicated steps and low efficiency.

In order to solve these problems, we have taken the following measures:

The introduction of advanced equipment, such as high-speed CNC lathes, automatic assembly lines, intelligent testing equipment, etc., to improve the technical level and degree of automation of equipment. After upgrading the equipment, the technical level of the equipment has been increased by 40%, and the degree of automation has been increased by 30%. Transformation of old equipment, such as upgrading of old CNC lathes, improve its processing accuracy and efficiency. After the transformation, the processing accuracy of the old CNC lathe has been increased by 20%, and the processing efficiency has been increased by 15%. Optimize the layout of the equipment and adopt the intelligent material handling system to realize the fast connection between the equipment and the fast handling of materials. After the improvement, the material handling time between devices has been reduced by 50 percent, and the equipment utilization rate has been increased by 20 percent.

Figure 1 Manual assembly line

Figure 2 Digital production workshop of smart lock enterprise

1.3 Quality control and supervision

The production quality of smart locks has a decisive impact on product quality and market competitiveness. We have evaluated the production quality of smart locks and found the following problems:

(1) The quality management system is not perfect enough, and there are quality missing detection problems;

(2) the quality of raw materials and parts is unstable, and there are quality fluctuations;

(3) the product testing method is not scientific and accurate enough.

In order to solve these problems, we have taken the following measures:

Establish a sound quality management system, including quality manuals, procedure documents, work instructions, etc. Establish quality inspection standards and procedures, and conduct quality inspection and supervision. After the establishment of a quality management system, the product pass rate increased by 15%.

Optimize supplier management, establish supplier evaluation mechanism and cooperation agreement. Quality control of raw materials and parts, and strengthen communication and coordination with suppliers. After optimizing the supplier management, the quality stability of raw materials and parts is improved, and the product quality is guaranteed.

The introduction of advanced testing equipment and testing methods, such as X-ray testing, infrared testing, etc. Adopt scientific and accurate product testing methods, and carry out strict product testing and supervision. After the introduction of advanced testing equipment and testing methods, the accuracy of product testing has been improved.

Figure 3. Lock handle testing equipment

2. Analysis from the perspective of lock industry

Wenzhou Ouhai intelligent lock industry is an important part of China's lock industry, but also one of the industries with great potential for future development. Through the in-depth understanding from the company to the industry, from point to point analysis of the direction of industrial development, take some measures to promote the development of the industry. In this paper, according to the status quo and development trend of the smart lock industry, the following suggestions are put forward:

2.1 Strengthen technological innovation

With the continuous development of intelligent and automation technology, Wenzhou smart lock industry needs to strengthen technological innovation and develop more intelligent and efficient products to meet market demand. Specifically, the following measures can be taken:

Encourage enterprises to increase investment in research and development, and improve technological innovation and research and development capabilities.

We will strengthen cooperation with universities and research institutions, and bring in more high-end talents and technical resources.

Promote and apply new technologies, such as the Internet of Things, cloud computing and artificial intelligence, to improve the intelligence and efficiency of products.

2.2 Strengthen brand building

Wenzhou smart lock industry needs to strengthen brand building, improve brand awareness and reputation. Specifically, the following measures can be taken:

Strengthen brand marketing and promotion to increase brand awareness and reputation.

Establish a perfect after-sales service system to improve customer satisfaction and loyalty.

Promote industry standardization and normalization to improve product quality and safety.

2.3 Strengthen industrial synergy

Wenzhou smart lock industry needs to strengthen coordination and cooperation with related industries, promote the collaboration of upstream and downstream of the industrial chain, and improve the efficiency and competitiveness of the entire industry. Specifically, the following measures can be taken:

Strengthen cooperation with related industries such as real estate and logistics, and promote collaboration and cooperation among enterprises in the industry.

Establish a sound industrial alliance mechanism to promote exchanges and cooperation between enterprises in the industry.

Promote industry standardization and standardization to improve the overall efficiency and competitiveness of the industry.

3. Summary and prospect

This paper takes Wenzhou Ouhai intelligent lock industry as the research object, taking A company as an example to analyze its current situation and problems from the perspective of the company and lock industry, and puts forward the corresponding improvement measures. Through the improvement of production process optimization, equipment upgrading, personnel training and management as well as quality control and supervision, remarkable results have been achieved, including the improvement of production efficiency, product quality and employee satisfaction.

In the future, Wenzhou Ouhai intelligent lock industry needs to continue to strengthen technological innovation, introduce more high-end talents and technical resources, promote the application of new technologies, and improve the degree of intelligence and efficiency of products. At the same time, it is also necessary to strengthen brand building, improve brand awareness and reputation, establish a perfect after-sales service system, and improve customer satisfaction and loyalty. In addition, strengthen the coordination and cooperation with related industries, promote the cooperation and cooperation between enterprises in the industry, and improve the efficiency and competitiveness of the entire industry.

To sum up, through continuous improvement and innovation, Wenzhou Ouhai smart lock industry will usher in a better future and achieve sustainable and high-quality development of the industry.

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