Application of Industrial Design in the Development of Environmental Protection Quick-frozen Products

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Abstract. With the change of the times, the industry design style and design concept of each period will continue to advance at a higher and higher level. Consequently, environmental protection, concise and practical design has been affirmed and respected by most people in the industry. Such as: environmental protection refrigeration equipment, nitrogen environmental protection quick-freezing refrigeration equipment for people's lives to provide fresh food design. With the gradual improvement of people's living standards, people's attention to food has shifted to the importance of nutrition and quality. Due to the diversification of current consumption patterns, people's requirements for food preservation have also increased a lot. With the extension of China's highway, highway transportation has also developed. The status of applications based on quick-freezing technology for fresh food will be the rapid development of fresh food refrigeration technology, and industrial design will play an important role in it.

1. Introduction
Research on the appearance design of environmental protection equipment and instrument products is an important manifestation of the improvement of independent innovation ability. Industrial designs can actively guide and support enterprises to develop more high-tech environmental protection technology and equipment with independent intellectual property rights. On the basis of mastering the core technology of environmental protection, more attention should be paid to product packaging design. In addition, we can also learn from the advanced new technologies at home and abroad, combine with the development needs of enterprises themselves, through the introduction, digestion, absorption and innovation, forward their core technology, thus promoting the overall upgrading of the enterprise industrial chain.

In ancient times, people knew that cooling could prevent food from decaying. People began to use ice to refrigerate food. In order to transport food, ensure food safety and non-decay, people use ice and food loading together to reduce the temperature in the box and prevent food deterioration. In order to keep the temperature in the carriage at low temperature, people will make the material of carriage into heat insulation material. The heat insulation material is lighter. This is the quick-frozen food of ancient people. There was no foam in ancient times, but there were some kinds of thermal insulation materials such as cork, wood and so on. In contemporary society, the development of science and technology mainly uses chemical products to make thermal insulation materials, such as polystyrene foam and polyurethane foam.

In contemporary society, people have a higher pursuit of food freshness, which promotes the further development of food preservation technology. Vacuum freeze-drying of food is to freeze food...
materials below the eutectic point temperature to change water into solid ice, and then sublimate ice to water vapour at appropriate temperature and vacuum, and then condense water vapour with water vapour condenser of refrigeration system, so as to obtain drying technology of dried products. Vacuum freeze-drying technology can maintain the structure, nutrient components, shape and biological activity of food, which is incomparable with other food drying methods. But vacuum freeze-drying technology has its fatal disadvantage, that is, large investment in freeze-drying equipment and high energy consumption. With the localization of freeze-drying equipment, the one-time investment of the equipment has dropped dramatically, but its energy consumption is still the bottleneck restricting its development.

In order to ensure that the nutritional components of food are not lost, and that the colour of food is bright, food needs to be frozen to quick-frozen. Quick-freezing [1-4] can crystallize the internal ingredients of food. When food is eaten, thawing the food is to turn the crystallization into food juice, making the food return to the appearance before quick-freezing, and the food will have a very delicious taste and rich nutrition. Quick freezing is a very good freezing technology in today's society, which can ensure the nutrition and colour of food. Environmentally friendly energy promotes better development of quick-frozen industry. Diversified products and higher technology help industrial designers to broaden their horizons for quick-frozen product design [5-7].

2. Current Situation of Industrial Products Applied in Food Quick-freezing and Fresh-keeping

The present situation of fresh food preservation technology at home and abroad was analysed. The current situation in China is that domestic manufacturers have introduced advanced technology and mature equipment from abroad to establish multiple storage depts. At the same time, they have spent a lot of manpower and financial resources on food preservation technology, but the results are unsatisfactory. There is a big gap between the ideal and the result. The main reason is to follow the trend blindly, thus ignoring the domestic situation and the actual production situation of the current manufacturers. This will directly lead to the introduction of foreign technology and equipment cannot be quick-frozen, and reduce the efficiency of equipment. At the same time, there may be a combination of the original equipment and the introduction of new equipment, making fresh food preservation problems appear, such as: food loss, food deterioration and so on, which will cause inestimable losses to enterprises. It also poses a threat to food safety, which is not conducive to people's health. In addition, the state has few regulations on fresh food preservation technology, and there is a lack of innovation on fresh food preservation technology. In terms of food preservation technology, foreign capital is much better than domestic. Foreign capital forms a mode: purchase, production, processing, storage, transportation and sales. Fresh food should also pay attention to the process of refrigeration, sorting and transportation of fresh food while paying attention to preservation. In these processes, Different Fresh-keeping measures are adopted to keep fresh food. The national policy plays an important role in the domestic food preservation industry. Through the policy, the research on insurance food technology will be strengthened, which will make the food preservation technology more and more advanced [8-14].

In the 1990s, the scientific research staff of the National Fresh-keeping Engineering Canter began to work on the research and development of grape preservatives, adjusted the composition of sulphite preservatives, and added new technologies such as microcapsules, which kept the release rate of grape preservatives stable and sustained, greatly improved the freshness-keeping effect, and further developed two stages of release and recovery. The preservative of the mixture has a remarkable effect on preservation. At the same time, they have made great achievements in the development of new fresh-keeping film technology, invented a new type of fresh-keeping film with moisture-regulating function, thus forming a special fresh-keeping material for grape and professional and scientific fresh-keeping storage measures.

Preservation of biological preservatives is a new technology emerging in the world in recent years. Its principle is the method of producing bacteria by bacteria. At present, it has achieved good results in the preservation of fruits and vegetables. It is other mould that is used more in this method. This
fungus is a natural, broad-spectrum, efficient and safe filamentous fungal inhibitor. It can not only inhibit fungi, but also prevent the production of mycotoxins. The biggest advantage of this method is that will not be absorbed by the digestive tract of the human body, so it is a harmless fresh-keeping technology for the human body. Another advantage is that many microorganisms are difficult to resist, and because of their low solubility, they are generally used as food surface preservatives. It has been internationally recognized as a safe biological preservative for food storage and preservation.

3. Design and Analysis of Refrigeration Quick-freezing Equipment
In a narrow sense, industrial design mainly refers to product appearance design. Industrial design is at the front end of the whole product development process. Mainly participate in the design of exterior modelling programs, determine the artistic ideas. Only by defining the shape, can we carry out the next structural design (MD design). This is the reason why there is no hair attached to the skin. Industrial design in mechanical design and development can neither violate the principle of mechanical structure, nor design arbitrarily. They are interdependent and need to be adjusted and modified repeatedly. For example, when you design an appearance, the shape involved, the material used will make the die or welding impossible. That is meaningless appearance design.

3.1 Visual Design
The visual design of quick-frozen products mainly embodies the colour aspect. Environmental protection, green pollution-free is the national policy, but also we must do to protect the earth on which we live. Quick-freezing is mainly manifested in the speed, to quickly complete the food quick-freezing, so the use of streamlines and strong sharp symbols to express. The colour can be blue to express the feeling of freezing, or white or black to add ice and snow to the pattern. Some quick-frozen products are dynamic objects, moving objects, can use bright colours, attract people's attention, so can use blue contrast orange, yellow and other bright colours.

3.2 Structural Design
The structural design of quick-frozen products needs to consider the aesthetic design of the shape. The structure of refrigerated truck should conform to ergonomics, give people the feeling of common things in life, will not appear abrupt, absolutely will not have the feeling that it is difficult to integrate life. In line with the operation of people's common transport vehicles, easy to operate, so that people are pleased to accept this refrigerated vehicle.

3.3 Security Design
Safety design of quick-frozen products refers to the possibility of damage of quick-frozen equipment stored in open air or in secret places of people. Leakage of chemical gases or liquids used for preserving fresh food such as heat preservation will cause some unnecessary property losses and threaten the personal safety of people nearby. Complete design is to ensure the safety of products and eliminate these hidden points. Suffer from. So in product design, safety is a crucial link. Structural safety is to ensure the normal operation of the product, if there are problems and timely repair, timely reinforcement. As the name implies, the safety of colour is to let people see that the colour of this product will not be misguided.

3.4 Green Design
Green design originates from people's reflection on the destruction of environment and ecology caused by modern technology and culture. For industrial design, 3R principle is the core of green design. The so-called 3R refers to Reduce, Recycle and Reuse. Green design requires that every step of the product life cycle be taken into account: from the creative conception of the product to the manufacture and transportation, from the product being used by consumers to the recycling of the final product. Ensure that each link has the least impact on the environment. The most common manifestations are the following two aspects: Disassembly design. Disassembly design is a design method that makes
products easy to disassemble and maximizes profits from material recovery and parts reuse. It is one of the main contents of green product design. For example, we can use threaded joints instead of welding and riveting in machine tool design. Thread connection is not only easy to disassemble and assemble, but also reliable, which has the characteristics of reuse. In order to reduce the number of parts, screw integrated structure can be used to replace ordinary screw and gasket, anti-loosening washer, etc. The design principles of disassembly are as follows: firstly, reduce the workload of disassembly; secondly, it is easy to disassemble and separate; thirdly, it is to use more standard parts. Recyclability design. Recyclability design is also one of the main contents of green design, which considers the possibility of parts recycling and reuse in the early stage of product design, that is, parts and materials in used or waste products can be used in other new products.

3.5 Humanized design

Humanized design is to design people-oriented. In view of the defect of the functionalist design idea, he proposed that the design should not be based on the function of machines, but on human beings. Based on people's use of products, the machine can serve people well. With the development of technology and the progress of society, people's requirement for humanization of products is getting higher and higher, especially for some designs related to people's safety in use, such as machine tool product design. Humanized design is to design people-oriented. In view of the defect of the functionalist design idea, he proposed that the design should not be based on the function of machines, but on human beings. Based on people's use of products, the machine can serve people well. With the development of technology and the progress of society, people's requirement for humanization of products is getting higher and higher, especially for some designs related to people's safety in use, such as machine tool product design.

4. Conclusions

The influence of industrial design on environmental protection quick-frozen products is getting deeper and deeper. Designers need study quick-frozen equipment, including its shape, colour, safety, emotion and so on. As long as they keep exploring, researching and designing, they will promote the development of this industry. Industrial design plays a very important role in it. Modern design concepts mainly refer to green design, humanized design, product semantics design and product system design. In terms of design, these main design concepts correspond to each other: in terms of environment, we should show our concern for the environment; in terms of people's use, we should show our concern for people; in terms of product semantics, we should reflect the local cultural characteristics; in terms of brand management, we should pay attention to the inherent quality of products, making design an effective means of brand marketing. There are two concepts: one is to conform to the human scale; the other is to have a good operating interface. Good operation interface can make the operation more convenient, fast, safe and reliable.

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