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Research on Innovative Design of Huizhou Bamboo Ware

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Abstract

This paper mainly studies the application and innovative design methods of bamboo products, including but not limited to the innovation of raw materials, structure, technology and function of bamboo products, and analyzes the important role of bamboo products in the design field from the perspective of practical and appreciation. First of all, the research status and development trends at home and abroad are analyzed. Secondly, the development dilemma of Huizhou bamboo ware is analyzed. Finally, the innovative design scheme is proposed.

Keywords

Bamboo products; Development dilemma; Innovative design.

1. Introduction

At the present stage, people pay more attention to the inherent form and application of bamboo products, but pay less attention to the innovative design of bamboo products. The design and application of bamboo products has unique historical significance.

Carry out comprehensive research and analysis on the innovation possibility of traditional bamboo wares in Huizhou. It includes the historical origin of Chinese bamboo and the development history of bamboo in Huizhou, Anhui Province, China, the innovation of raw materials of Huizhou bamboo, the technological process of Huizhou bamboo, the inheritance method of Huizhou bamboo technology, the representative inheritors of Huizhou bamboo, and the comprehensive research on the productive protection of Huizhou bamboo. At the same time, it analyzes the relevant problems of the production of Huizhou bamboo industry, and puts forward relevant suggestions and countermeasures for inheritance and development. Through the research on the application of bamboo products and their innovative design methods, we will further explore various innovative methods of bamboo products in the field of design, aiming at doing a good job in the development of new products of bamboo, improving the artistic and economic value of Huizhou bamboo, and designing bamboo products that are really needed for a convenient, green, comfortable and environmentally friendly life, so that they can play a greater role in the field of design in the future.

The raw material processing machine of bamboo is used to greatly improve the processing and manufacturing efficiency of bamboo. Solve the problem of long production cycle of artisans. The production process adopts the transplant design method to solve the single problem in the process. For example, the bamboo chair surface of the bamboo chair is transplanted into the bamboo woven chair surface. Achieve innovation in bamboo products technology. The comprehensive design method combines bamboo with various types of materials to achieve innovation in the material of bamboo products. Solve the problem of monotonous material of bamboo products. After mechanized production, the cost and quality of the treatment of bamboo silk and bamboo chips have been greatly optimized. Therefore, to some extent, bamboo strips and bamboo silk woven goods have also gained new life. Using bamboo's own

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characteristics, such as flexibility, hardness, stability and beauty, we can always see the use of bamboo silk in more excellent designs. Bamboo products have made innovations in raw materials, structure, technology and functions, which not only enhance the influence of bamboo products, but also enrich the cultural connotation of products.

2. Research Status and Development Trends at Home and Abroad

In China, many experts and scholars have conducted in-depth research on the development history of bamboo products art, overview of bamboo products culture, bamboo furniture design, bamboo technology and other aspects. In the field of display, the art of bamboo product display has been systematically studied from the aspects of shape, color, structure, space, etc. Many domestic experts and scholars have carried out a series of fruitful studies on the cultural, artistic and practical aspects of bamboo products, such as Peng Shuncun, Xu Huadang's "Chinese Bamboo Weaving Art", and Pan Nianchang's "Bamboo Furniture and Bamboo Weaving". They have analyzed in detail the combination of bamboo furniture and bamboo weaving, and the methods of using bamboo weaving and bamboo furniture.

2.1. Domestic research methods

There are three main research methods in China.

(1) Literature method. By collecting and consulting relevant documents and materials of Huizhou, such as the Ancient Huizhou Local Annals, Huizhou Documents and other information to sort out the development vein and technological process of Huizhou bamboo, we will also collect the flow of Huizhou bamboo works since ancient times by consulting relevant collection documents and other information, so as to more systematically sort out Huizhou bamboo archives and establish a traditional Huizhou bamboo library.

(2) Field survey method. Use the field survey method to obtain relevant information about the technological process, industrial status and development of contemporary Huizhou bamboo ware. There are two ways: first, face to face with old artists and inheritors to understand the technological process, historical evolution, and the difficulties and challenges faced by the development of today's bamboo. The second is to carry out field investigation on bamboo workshops and enterprises to understand the development status and business model of bamboo industry; Product categories, consumer groups, social and economic benefits, development prospects and constraints.

(3) Statistical analysis. Carry out statistical analysis on the collected data in order to better find the problems existing in the current bamboo art inheritance and industrial development.

2.2. Domestic development trends

First, actively develop bamboo products and enrich the structure of bamboo products. Bamboo products enterprises should cooperate more efficiently with agriculture and forestry, introduce bamboo products design and R&D talents, promote the independent research and development of bamboo products, and continue to invest in product development, such as increasing the innovation of bamboo products, increasing the development of mixed materials products, and improving the quality and added value of products. As well as new bamboo household articles that meet the market demand, such as bamboo straw, bamboo storage box, storage rack, etc.

Second, bamboo products enterprises should introduce advanced bamboo products production equipment, or carry out intelligent transformation of machinery and equipment, optimize the production process of bamboo products, optimize the product structure, continuously increase the proportion of deep-processing products, and focus on developing products with high technological level and added value. In addition, bamboo production areas should introduce key common technologies, cutting-edge leading technologies, modern engineering technologies, and disruptive technologies to jointly tackle key problems, break through a number of key core

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technologies of the bamboo products industry with good prospects for industrialization, and guide the bamboo products enterprises in the region to learn and produce, through technology to promote the transformation of bamboo products from rough processing to deep processing, improve the utilization rate of bamboo resources, and promote the sustainable and recyclable development of the bamboo products processing industry chain.

Third, combine intelligent technologies such as the Internet of Things and AI to improve the intelligent level of the bamboo products industry. China's bamboo products industry is still in the "labor-intensive" stage, and the main development direction of enterprises is still to improve the appearance and structure of bamboo products. They fail to combine modern high-tech and intelligent technology with the production and design of bamboo products. Although they have also learned some advanced production ideas and management methods abroad, they are only superficial and not really applied to the production and design of bamboo products. If intelligent technologies such as Internet of Things and AI can be applied to bamboo products such as bamboo furniture, it is believed that the intelligent level of bamboo products industry will be greatly improved.

Finally, when the regional bamboo industry innovatively develops the bamboo products industry, it needs to give certain tax incentives, financial and other policy support, cultivate the leading enterprises of the bamboo products industry, guide and encourage the innovative development of the bamboo products enterprises, promote the formation of the bamboo products industry into a comprehensive industrial chain integrating the cultivation of bamboo resources, processing and sales of bamboo products, and promote the upgrading of the local bamboo industry.

2.3. Foreign research achievements and development trends

Foreign experts and scholars have also carried out a series of fruitful research on bamboo products, such as (Japan) Japanese Handicrafts by Yukichi Ruda, (Japan) Doors • Walls • Hedges • Bamboo Hedges - The Latest Japanese Garden Design by Ishikao Miyahashi, Space Language by Brian Sen, World Architecture Art History by Patrick Newkins, and so on, In addition, there are some important journals and magazines that also involve bamboo products, which have important theoretical value and reference significance for the study of this topic.

(1) Africa "Ghana Programme". The bamboo production area in Africa is the smallest of the three major distribution areas, and the bamboo industry is relatively behind other bamboo production areas. Due to the backward production and processing technology, as well as the third area of development funds, it is difficult to form a complete industrial system for bamboo development. In recent years, due to the advantages of bamboo products, more and more widely recognized. UNIDO attaches great importance to the development, utilization and processing of bamboo products, and chose Ghana to carry out bamboo development Cooperation in this field of industry. Under the "Ghana Integrated Programme" project organized by UNIDO, Ghana sent representatives to participate in the international bamboo training course held by China: China was entrusted to carry out technical tests on bamboo samples from Ghana, and relevant personnel from Ghana were sent to visit China. Under the promotion of UNIDO, the Ministry of Lands and Forests of Ghana submitted a memorandum to the Cabinet of Ghana requesting the Government to adopt a bamboo and rattan development policy in Ghana. Bamboo industry will soon become an important source of poverty alleviation and agricultural income in Africa.

(2) Bamboo weaving originated in China and was refined in Japan. After the introduction of Chinese culture into Japan, Japan has absorbed Chinese bamboo culture and has a good inheritance and development. It has combined with Japan's inherent bamboo culture to form a unique Japanese bamboo culture. Folding fans made of bamboo by Japanese are deeply loved by Chinese people. Japan's Sanchong Prefecture has developed a new technology for

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manufacturing biodegradable molding materials from bamboo. Japan's bamboo industry is rich in bamboo culture and high-tech connotation, leading the direction of bamboo processing and utilization in the world.

3. Development Dilemma of Huizhou Bamboo Ware

The consciousness of protection is not strong, the strength is insufficient, the production mode is defective, and the style of Huizhou bamboo carving art is relatively single. At this stage, the majority of Huizhou bamboo carving crafts adopts the traditional inheritance methods of master and apprentice and father and son. These two inheritance modes are very easy to cause the scarcity of contemporary craftsmen. Shallow market combination and solidify marketing mode.

The development strategy of Huizhou bamboo carving: improve the government support and industry association supervision system. In the work of vigorously protecting bamboo carving skills, local governments should uphold the concept of public culture, appropriately introduce traditional cultural protection indicators in the assessment of political achievements, and overcome the utilitarian tendency of one-sided pursuit of economic interests. Zhu Wei, the inheritor, has clearly put forward the view that the inheritance of intangible cultural heritage should be combined with the market, and Huizhou bamboo carving should also "old trees and new flowers". We should adhere to and improve the traditional two modes of father-son inheritance and master-school inheritance. On the other hand, we should innovate the training mode and vigorously promote the two modes of vocational school learning and employee learning. The protection of intangible cultural heritage should not stay on the slogan. We should guide the general public to improve their awareness of the protection of cultural heritage. On the one hand, we should strengthen our own publicity; On the other hand, we should give play to the public opinion guidance role of the mainstream media.

Culture is not created, but inherited. As one of the important heritage schools of bamboo carving technology, Huizhou bamboo carving is a concentrated display of the integration of Huizhou culture and Huizhou folk craftsmanship, which contains infinite vitality and vitality. Today, when many intangible cultural heritage skills are almost lost, the protection and inheritance of Huizhou bamboo carving needs to be carried out in a consistent manner. Only when all parties uphold the concept of inheriting the bamboo carving art and developing the bamboo carving industry, can traditional carving continue in modern society with a better appearance and glow with new vitality.

4. Innovative Design Scheme of Huizhou Bamboo Ware

The innovation mainly includes the innovation of raw materials, structure, technology and function.

4.1. Raw material innovation

Bamboo raw fiber is the state of breaking raw bamboo into coarse fiber, adding soft material mixed with organic resin, and then making relevant molds for it to form relevant bamboo raw fiber products. Foreign factories with relevant processes are developing similar products, mainly using hemp fiber. This material can also solve some industrial problems from raw materials, such as environmental protection, sound insulation, moisture absorption, etc. It can meet the needs of some special environments at present. From the traditional bamboo weaving to the innovation of bamboo products technology, many designers still use bamboo as the main material for product design. From furniture design to lamp design, designers show their respect for bamboo. With the further development of technology, bamboo products design will become more colorful with the creativity of product designers. China is the country with the richest

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variety of bamboo resources, the longest history of bamboo product production and the deepest bamboo culture. Promote the integration of new bamboo materials, such as bamboo fiber composite materials, bamboo fiber profiled materials, directional reconstituted bamboo laminated materials, bamboo winding composite materials, bamboo exhibition plates, etc.

4.2. Structural innovation

(1) Refactoring design. Discovery - analysis - bringing - induction - creation - formulation - monomer elements - monomer - connection method - constitute products. There is a reconstruction phenomenon in the alternation of new and old products. When people choose products, it is not "brand new" or "antique", but "new and old" or "similar and different". This is because this product combines people's existing experience to create fresh and safe connections, which is easy to understand and accept. Reconstructed design is applicable to the traditional way of using materials, so it is widely used in the innovative development and design of bamboo products.

(2) Monomer design. From the design point of view, the monomer of bamboo products is not only the change of shape, quantity, connection mode, etc., but also the specific changes include various factors of product, i.e. commodity composition; The content of the design concept is expressed through the connection of monomer and monomer group, so the representative of a monomer group can express the comprehensive functional factors of the product in the local or global, concrete or abstract, product or commodity, and become a monomer element through the specified connection method; During design, the purpose of creating new products is also achieved through the selection, adjustment and determination of monomer elements, and the support of monomer groups in quantity and the cooperation of connection methods.

(3) Migrate design. "Transplantation" in design refers to the concept of substitution in the physical sense, while in the deeper sense of design, it refers to the transplantation of culture. Therefore, the meaning of this transplantation refers to the transplantation of culture, that is, the excellent traditional national culture of the Chinese nation or other nations in the world is rendered, sublimated, and symbolized through the carrier of bamboo products, that is, the culture is transformed into the shape symbols and decorative elements of bamboo products, and integrated into bamboo products through traditional or modern technical means.

(4) Disassembly design. Disassembly design can be defined as a feature of the product, which can enable the product to be dismantled at the end of its effective life in a way that allows its parts to be reused and recycled. The key point of detachable design is the design of product connection nodes. The traditional processing technology of bamboo products can enlighten the disassembly design. In the traditional bamboo products, the connection between components is flexible connection mainly by inserting and binding, rather than rigid connection such as welding and pasting, which ensures the convenience of product disassembly. Due to the environmental coordination of bamboo materials, bamboo products can be rapidly degraded into other forms of carbon after being discarded, and return to the natural energy cycle. The removable design ensures the smooth realization of this regeneration method. There are also many ways to regenerate bamboo products: some parts can be used as raw materials for other products. The waste part can be burned in the traditional way as energy, and can also be used as raw materials for other industries such as paper making. Dismantling itself is a new and modern structure.

4.3. Technological innovation

Bamboo splicing technology is a new technology project developed by modern bamboo industry. The roots, stems, branches, nodes and shoots of some bamboo materials are selected by using raw materials such as Phyllostachys pubescens, Phyllostachys heterophylla, and Zizhu. The materials are selected and shaped according to different ideas. A variety of handicrafts are

produced by the techniques of turning, splicing, carving, weaving, gluing, painting, sawing, shoveling, chiseling, grinding, splicing, gluing, and high pressure. The animals, figures and implements created through artistic treatment have the characteristics of concise shape, unique style and full of fun, which have both traditional artistic characteristics and strong sense of the times, and are therefore loved by people. For example, there are birds, eagles, landscapes, toys, appliances, plates, etc. This kind of handicraft has a vivid image. It can create birds and horses to fly, horses and horses to soar. It can create interesting scenery and create people's feelings. It gives people a sense of bold and unrestrained, and has a visual experience that does not open up the new face of art.

Bamboo laminated technology. In recent years, domestic bamboo processing machinery has been developed to a certain extent. On the basis of the combination of traditional bamboo processing methods and industrialization, the bamboo laminated timber industry has developed. Based on the production technology of floor-type panels, and drawing on the lamination and width-splitting gluing technology of wood laminated timber, its unique production process has finally formed. The core of the production technology of bamboo laminated wood panel furniture is to realize the processing of standard components. The production process content of bamboo plywood is basically the same as that of wood-based panels, but the process requirements are different. The strength and rigidity of bamboo laminated wood is higher than that of existing wood based panels, and it has the characteristics of high strength, good rigidity and wear resistance. After being made into large-format plywood, it not only retains the characteristics of bamboo itself, such as the texture and rhythm of bamboo knots and other aesthetic values, but also fundamentally improves the defects of bamboo such as small diameter, thin and hollow walls, and weak transverse strength. It can also be sawed, created, milled, drilled, and lengthened, and become an ideal engineering structural material, which has been applied in furniture manufacturing, building decoration and other fields. The production process of bamboo laminated timber is as follows: raw materials - cut and split (bamboo stalk longitudinal section) - finish processing (bamboo strip thickness determination) - carbonization/degreasing treatment (cooking, bleaching) - hydrothermal and chemical treatment - bamboo strip drying - fine creation - sorting - gluing - forming - hot pressing - sawing - sanding - processing of square timber (lengthening, widening, sawing, planing) - parts processing (slotting, drilling, sanding, milling) - surface coating - parts assembly - products - warehousing.

4.4. Function innovation

The function of products is one of the important reasons for people to choose. Bamboo products must meet the needs of people before people can use it. For example, transplanting design methods can transplant the advantages of other products into the design of bamboo products, thus achieving functional innovation. For example, the multifunctional long box designed by the author is to transplant the tray shape into the long board light. In addition to the rest function, the long box also has the function of placing objects.

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