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Exploration of Chinese Traditional Furniture Art Form in Practical Teaching

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Abstract. This paper studies the application and implementation of Chinese traditional furniture elements in contemporary art design, particularly in practical teaching. Through exploring the related curricular experiments and the practical projects of North China University of Technology, this paper analyses and explains the effect of traditional furniture, introduces the innovative design of traditional furniture structure and contemporary innovative design of traditional furniture patterns. These teaching achievements express the understanding of the cultural connotation of furniture and realize the interpretation of traditional Chinese furniture in contemporary design. It is an effective way to inherit and develop traditional furniture culture and art from mortise and tenon structures and patterns of traditional furniture as reference for contemporary design.

1. Introduction

It's important to inherit Chinese traditional culture and art for university students whose filed is design. Traditional culture and art provide rich nutrition, including cultural connotation, art form, and design elements. It is proved that the content of practical teaching in the curriculum of art design specialty can not only promote students' interest in learning, but also help to develop design thinking. In the practical teaching, students make full use of the opportunity to complete the modelling of the design, which learn from traditional art. It is consistent with the quality teaching advocated nowadays [1].

In North China University of Technology, for example, the class of furniture design, which contains three aspects: the first is the experimental course and curriculum design of furniture design listed in the syllabus; the second is the open experimental project set up by the university; the third is the scientific and technological activities and the entrepreneurship projects for students. The open experiments projects, scientific and technological activities and entrepreneurship projects are extracurricular practical activities, and these projects supported by the certain finance resources, which help students to complete the design extremely.

In the course or relative practical teaching of furniture design, it is explored the redesign of the structure of furniture, mortise and tenon structure, furniture pattern and so on. The first step is to learn traditional furniture. Through to measure, analyse, draw, saw, mill, install, etc., the students begin to learn the basic knowledge of Chinese traditional furniture. The second step is to separate the mortise structure and redesign. The third step is to extract the pattern of traditional furniture and redesign. From the following several cases, the specific methods and achievements of practical teaching of art design are illustrated.



2. Learning Traditional Furniture

Zitan wood waist armchairs with burl wood inlaid twelve zodiac animals, (hereinafter as the "Zodiac chair"), which is the classic Beijing furniture handed down from Zhan Ning Hall in the Summer Palace. The Zodiac chair is a three-panel-screen-form back armchair, also known as Taishi chair. [2] The structure of the zodiac chair is exquisite and worth studying. According to the basic form of the traditional chair, the structure of the zodiac chair was analyzed and duplicated. The main frame is made of zitan, which is matched with the panel of back and arm carved zodiac by beautifully burl. Burl is natural hemispherical outgrowth or a knot usually at the base of a tree. It has been prized since ancient times for its beautiful looking [3]. It uses tapered locking tenon to connect the back, armrests and the seat surface. The structure should be push and lock by two components, so it also called the running horse tenon. Tapered locking tenon has the advantages of free disassemble and assemble. The connection between the chair seat and the leg frame mainly depends on a long and short tenon of embracing shoulder tenon, which is blind mortise and tenon joint with a tapered dovetail wedge. The leg frame is the joint of the chair seat, and the bottom frame, which is the combination of the horizontal and vertical components. These complex mortises and tenons make furniture components bite each other, forming a stable and solid structure (figure 1). In practical teaching, students were required to measure, analyze, draw, saw, mill, install, etc., thus a Zodiac chair is duplicated. The process of duplicated Zodiac chair is also the process of further studying.

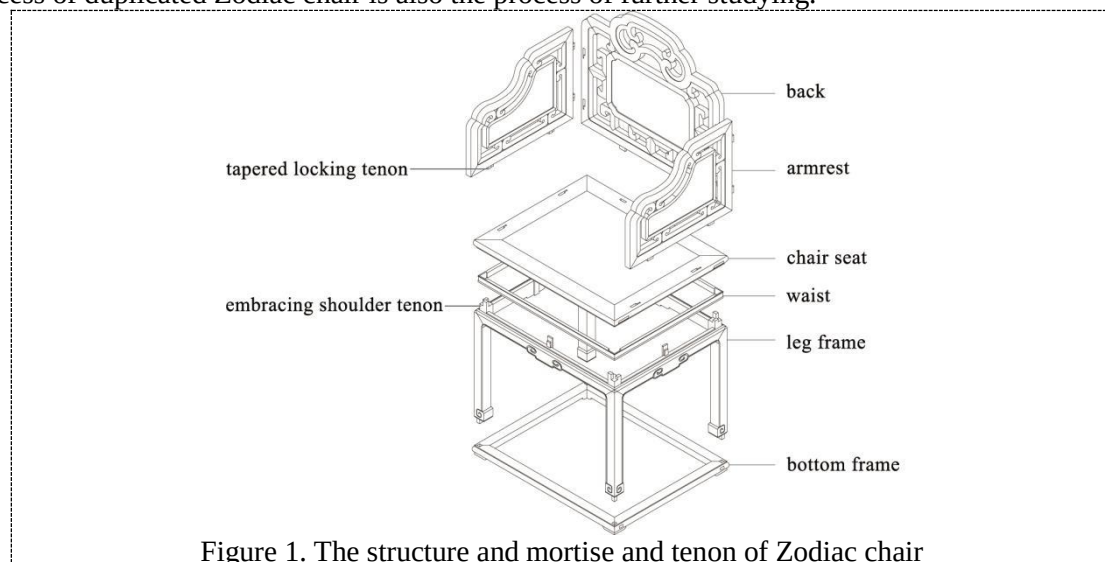


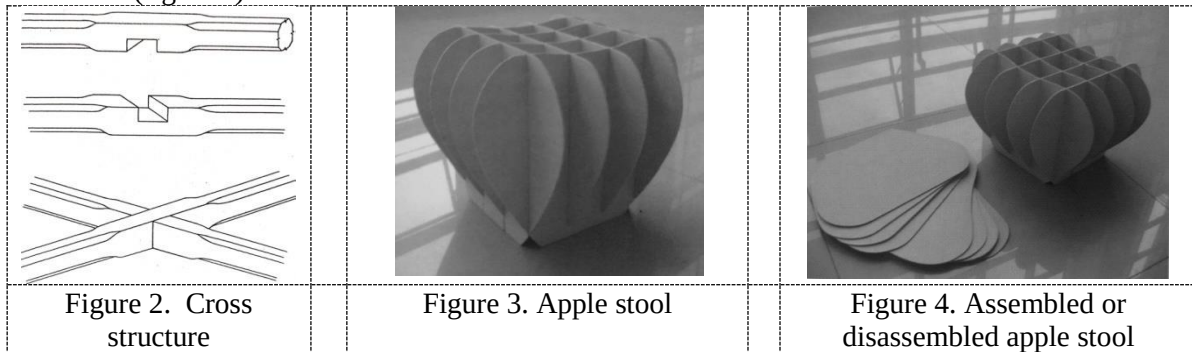
Figure 1. The structure and mortise and tenon of Zodiac chair

3. Structure

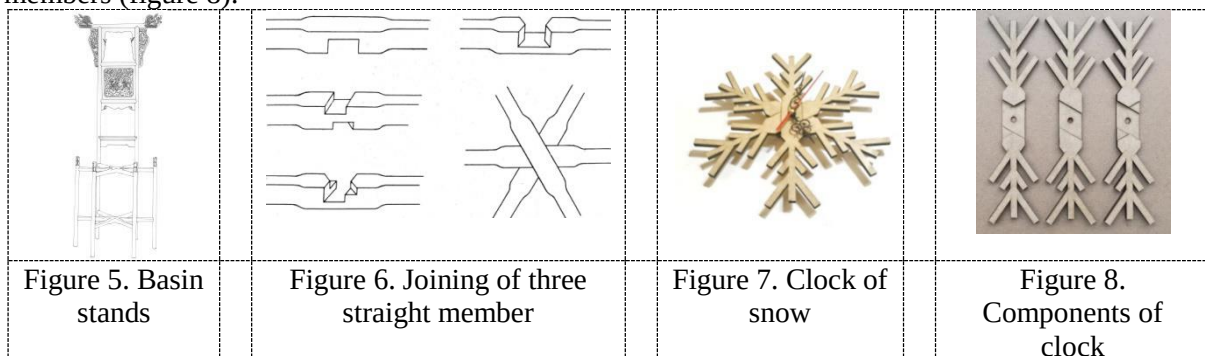
Mortise and tenon is a major feature of Chinese traditional furniture structure, which is a concave-convex connection method used on two or more wood components. The protruding part is called tenon; the concave part is called mortise (or mortise groove). When the tenon is inserted into the mortise, the mortise and tenon grip and play a connecting role. This is the main connection of ancient Chinese architecture, furniture and other wooden components. Although each component is relatively thin, it can withstand tremendous pressure as a whole. This structure does not lie in the strength of individuals, but in the combination and support of each other. Mortise and tenon is an ingenious combination wood part of more and less, high and low, long and short [4]. It can effectively restrict the twisting of wood parts in all directions.

The X-form stretcher of stool is joined by cross structure, which is kind of mortise and tenon. This structure is made of removing the half thickness of material from that part of both components where they intersect. When the components are attached, the form gains the thickness of a single component (figure 2)[3]. Referring to the cross structure of traditional furniture, apple stool in figure 3 is designed which composed of two kinds of components. In fact the outline of two parts are same, the cross structure just like figure 2. By using the occlusion of the cross structure of the eight components,

smooth and seamless surface of the joints is formed. Without other auxiliary materials or hardware, it is completely supported by the connection of its own structure (figure 3). When the stool is assembled or disassembled, it is just like playing with a big toy. If it needs to be stored, the cross structure can be disassembled into eight same size components without other auxiliary connectors, which is very convenient (figure 4).



On basin stands of figure 5[5], three straight components cross at the same spot, which developed from the X-form stretcher. The centre component in this type has one-third of the thickness cut away from the top and bottom, the upper component has two-thirds of the thickness cut away only from its bottom, and the lowest component also has two-thirds of its thickness cut away from its top (figure 6). When the form is assembled, the total thickness is equal to that of a single member. [3] In the open experimental project, learning from joining of three straight members, students design the clock of snow (figure 7), which is highly portable and flexible by using structure of joining of three straight members (figure 8).

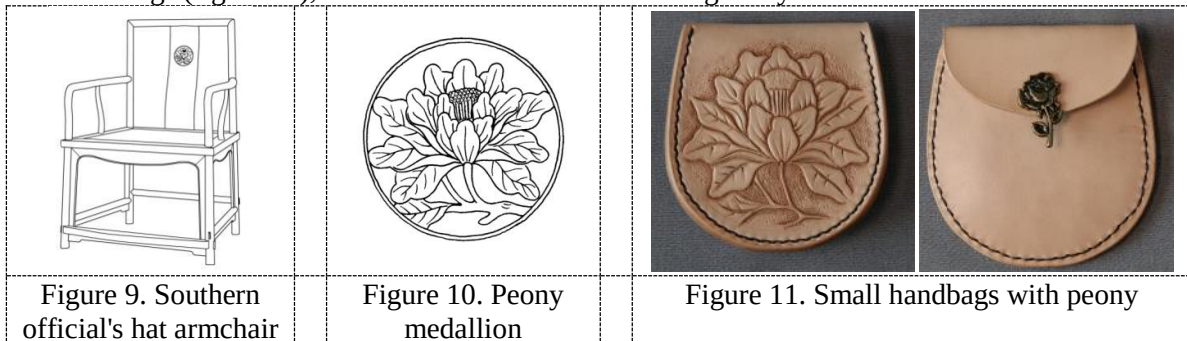


4. Motif

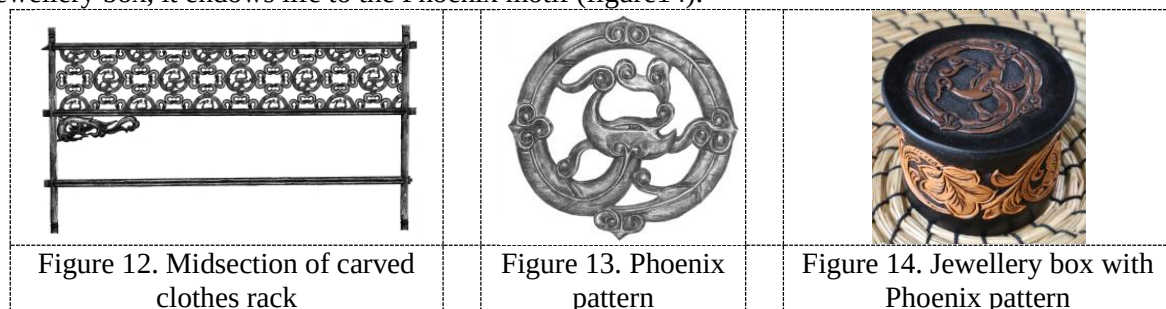
Traditional furniture is not only beautiful in shape and exquisite in structure, but also charming in decoration. There are three kind of patterns, the first is plant patterns such as curly grass, peony, plum blossom, chrysanthemum, lotus and so on; the second is animal patterns, just like Dragon pattern, Phoenix pattern, Kirin, Lion; the third is religious patterns and auspicious motif. All kinds of patterns are commonly used in furniture decoration, which are applied not only to hardwood furniture but also to black and gold lacquer, carved lacquer, lacquered wood inlaid with mother-of-pearl. Decorative materials include wood, bamboo, various kinds of jade, pearls, metal, various colors enamel, silk, embroidery, paper and silk painting, calligraphy and so on. It can be described as dazzling, colorful [6].

Figure 9 shows Ming zitan wood (red sandalwood) fan-shaped southern official's hat armchair. It is relatively special furniture, with a large size, a fan-shaped seat surface, and tenons out. The most attractive in this special design is the peony medallion on splat (figure 10)[7]. It adds a charming and elegant to the chair. The peony is praised to be a national beauty and heavenly fragrance by Chinese, and regarded as the King of all flowers. It is the symbol of peace, happiness and prosperity. In the scientific and technological activities projects, students are asked to draw traditional furniture patterns and figure out the shape, scale and decorative characteristics of furniture through imitation. Three

views drawing of furniture to help students understand the structure of furniture; perspective help students to understand the spatial and volumetric relationship of furniture; line drawing of peony flowers help students to grasp the exquisite sculpture. The exquisite peony pattern should be highlighted as a single pattern when it is used. At last, this scheme is used in leather sculpture to make small handbags (figure 11), which can be described as the ingenuity.



The furniture in figure 12 is the midsection of carved clothes rack of Ming Huanghuali. The pattern is formed by phoenix and four-cloud unit motif. The motifs of cloud and phoenix are carved from panels of wood, which are joined with loose pins. Phoenix pattern (figure 13) is more attractive such as slender outline phoenix eyes, rolled crown, and the tail rotates around to form a circle, which is elegant [4]. In the entrepreneurship projects for students, the students were required to copy the pattern, using sketch to show the character of motif. In the period of redesign for the phoenix motif, several plans were talk about, and different materials were considered. In order to express the character of the motif, leather sculpture was decided, which can express the power of phoenix motif. As a lid of jewellery box, it endows life to the Phoenix motif (figure14).



In teaching, the deeper connotation of traditional furniture decorative patterns is explored. It can not only be applied to furniture with original style, but also be extracted as decorative or design elements to interpret a wider range of design. Traditional furniture patterns show the perfect combination of traditional Chinese painting and art, and the combination of modern life and fashion, which shows its profound artistic characteristics.

5. Conclusion

These practical teaching achievements express the understanding of the cultural connotation of furniture and realize the interpretation of traditional Chinese furniture in contemporary design. Extracted elements from mortise and tenon structures and patterns of traditional furniture used, as reference for contemporary design is an effective way to inherit and develop traditional furniture culture and art.

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