Analysis on the Aesthetic Characteristics of Wood Skin Construction

Shuangying Wu[a], Liang Yan [b, *], Ailin Gao, Jia Li, Yiman Liao and Zheng Ren

[a]1473386462@qq.com, [b, *] 51027540@qq.com

Abstract. Whether for architectural design or theory, architectural skin is a hot spot in today's architectural world. The material for architects is no less than the notes to the composer, the paint to the painter, the foundation of the architect's creation, and the indispensable element of architecture. In other words, building skin materials are indispensable material language for architectural construction, emotional expression, personality symbol and cultural heritage.Among them, wood is easy to grow, acquire and process. It has been an important building skin material since ancient times. At the same time, because of its irreplaceable elegance and flexibility, it can tell the architectural language of unique texture, color and light. It is the material of choice for expressing the aesthetic language of architectural skins.

Keywords: building skin; wood; aesthetics.

1. Introduction

The building skin refers to the surface structure of the building. It defines the interior and exterior space of the building and is the business card for the building to display.The building skin objectively displays the structural ontology information such as structure, material and shape, and has been characterized from the perspectives of social humanities and ideas. Its expression is not limited to the building materials themselves, but also relates to the energy-saving technology, design concept and construction art of the building. Wait.

Since the modern times, the design of the building skin has gradually developed. As the interface between the interior and the exterior of the building, energy exchange and information transmission directly occur. The design expression of the building skin has become the focus of architectural fashion.The aesthetic expression of the building skin is not only limited to the form and color expression, but is gradually diversified. It is no longer limited to simple geometric aesthetics, but focuses on the innovative use of traditional materials and the expression of ecological energy-saving technologies. Emphasis on the emotional connection between architecture and people, focusing on the texture expression and aesthetic design of the building materials themselves.While wood is the most closely related to human beings and has the characteristics of green energy conservation, this paper analyzes the characteristics of architectural skin in terms of architectural aesthetics, and does not describe other aspects.

2. Material Background

Since the primitive society, there have been various natural building materials in nature, such as soil, wood, stone, grass, bamboo, etc., which have provided rich choices for the construction of early humans.In the birthplaces of different human civilizations, human ancestors used the locally produced materials to construct the original architecture for humanity. Among them, timber has the longest history in Chinese architecture. In the early days of China, almost all buildings used materials. Mainly based on wood, it is easy to take and has a large number of objects. It is close to the sense of nature both visually and tactile.In the early stage of wood architecture, the combination of wood structure and aesthetic expression was integrated. With the changes of the times, the materials and technology were constantly updated, and the relationship between structure and skin gradually developed into a structure that was covered or hidden by the skin. The epidermis gradually becomes independent.

Wood has a colorful form in the aesthetic expression of the building skin. For example, the wood carving arch of ancient buildings gives people different aesthetic feelings due to their different

degrees of complexity, showing the complex beauty of the wood skin.With the development and advancement of technology, composite wood such as plywood and MDF was produced after the industrial revolution, which broadened the scope of use and expression of wood, and the specifications were not restricted. Wood was used more in the building skin. The form is also more diverse.

3. Material Characteristics

3.1 Color

The color of wood is simply referred to as the wood color. The wood of different tree species varies in color [1]. The wood is also changing color when exposed to air and sunlight for a long time. This trait is also unique in that wood is distinguished from other materials. In terms of color, the wood grain is generally gentle and low-key, and there is no strong and vivid color, add the smooth and friendly texture, the wood gives a soft visual experience.Wood has a strong compatibility in architecture, which can be used in a large amount. The design of the construction skin.

3.2 Light and Shadow

Light and shadow can be said to be a kind of building material. If the existence of light and shadow is neglected, the architectural design will not reflect the effective value. The light and shadow construction of the building skin is from the artistic point of view, taking into account the relationship between technology and design [2]. When combined with a specific material, it forms a wonderful spatial relationship, as if the entity and the virtual body are enclosed, one positive and one negative, and the opposite is interesting. The type of wood is different, the light absorption and reflection are different, and the gloss is also present strong and weak,generally hard materials are more lustrous than soft materials. According to this characteristic, different soft and hard woods can be used in different space conditions to improve the light and shadow environment of the space. The outer skin of the American Aspen Museum is The wood is cross-woven, and when the sun is full, through the skin, a unique light and shadow effect is formed. The form of the cross is not closed, but a certain gap is left to form a transparent and breathable structure. Wind and light can swim freely between them.

3.3 Texture

The texture of wood is divided into natural and artificial texture. Natural texture refers to the natural pattern formed during the growth of wood. Each piece of wood presents different wood patterns. The uniqueness of this unity is unobtrusive, naturally stretched, restrained and low-key. The eyes and fingers are willing to linger on the wood, which is also the charm of wood different from other materials. Artificial texture refers to the artificial treatment of wood, such as painting the wood to meet the anti-corrosion needs, engraving special patterns to meet the aesthetic needs. , cutting different body blocks to meet the needs of use.In the building, the texture characteristics of the outer skin of the building are highlighted by changing the geometry of the wood, the degree of density of the arrangement, the cross-sectional size of a single individual element, and the emphasis of different orientation lines.

4. Combination and Matching

4.1 Regular Tiling

The regular tiling is to apply the same uniform material to the part of the building skin design. The similar composition of large area forms a strong sense of control and field in the visual, which plays a decisive role in creating the overall architectural atmosphere."piersons way" has applied this method. The large part of the building has selected cedar to form its skin texture, which gives the

building a warm and simple tone. The law of the epidermis interface of the rod structure, which takes the "line shape" as the texture, does not make people feel rigid, the texture formed by it makes the building facade rich and interesting, and gives a deep impression.

4.2 Local Dispersion

The role of local dispersion in the building skin is to enrich the space, complete details. Any building has a protagonist and a foil, in the part of the building skin, using wood to embellish, highlight the main part of the building, improve the integrity of the building.MK5, a wooden house clad entirely in larch, is located east of the center of Helsinki from the joran peninsula, Finland. The MK5 is made of highly custom-made interlaced laminated wood (CLT). Unlike the surrounding skin combination, the epidermis near the window is decentralized, and it plays a important role without affecting the overall architectural style.

4.3 Symbolic Symbol

The wood is condensed into a symbol representing the building and applied to the epidermis. It has a strong theme and representativeness. For example, the swastika pattern is mostly used in the outer eaves decoration of Chinese classical architecture, and it continuously expands in the vertical and horizontal directions to form a “ten thousand word brocade “pattern, meaning "rich and continually head"[3]

4.4 Overlay Combination

There are two types of superimposed combinations, one is to superimpose the same kind of wood to play a prominent role.The other is to superimpose the approximate wood to form a space and atmosphere with strong visual appeal.The outer skin of the timber construction company of Bressanone, Italy, is constructed in this way, using a series of vertical glued wood panels, creating a wave shape by means of superimposed staggering, and the outer contours of the wood chips are changed orderly to form a whole dynamic aesthetic effect.

5. Wood Skin Composition

5.1 Line Interface

The line structure interface refers to the skin of the building with the "line shape" as the texture feature, which is divided into a straight rod array arrangement, a straight rod staggered intersection, and a curved rod flexible arrangement.The line construction method usually covers the building skin to block light or for decoration, and can also be used as a semi-open space enclosure.The arrangement of the straight rod array refers to the arrangement of the linear rods in the form of an array, which is the most common arrangement method. By adjusting the cross-sectional size, length, density and arrangement direction of the rods to create different architectural atmospheres and visual perception, such as the vertically arranged lines, creates a tense and lively atmosphere, whereas the horizontal arrangement provides an endless stretch of stretch.Straight cross-intersection refers to the mesh texture formed by the intersection of different angles between straight rods. With the increase of the rods, the hollow shape of different sides can be formed. By adjusting the hollowing of the rods, different virtual and real transformation can be brought about.The flexible arrangement of the curved bar means that the rod forms a curved shape after processing, creating a flexible interface, and the curved line brings a strong visual motion, and is also very artistic.

5.2 Face Interface

The interface of surface structure refers to the skin of the building with the "face shape" as the texture feature, which is divided into panel tile cover, panel tile combination and panel space display.The flat tiling of the panel refers to the structuring method of covering the surface of the building with the uniformity of the planks of the size and material, and the formed skin interface is

strong overall, focusing on the color texture of the wood itself, giving the illusion that the skin is cut, concise atmosphere without losing interest.Panel tile combination refers to the division of the building skin,different wood are used in each area to form different textures and colors.,at the same time, the original skin can be partially preserved to create a floating feeling.Tokyo's “Easy Box” is a very simple box-shaped building. The building's façade is divided into 8×8 squares,using collage techniques and fits with different shapes of wood ,which finally forms a rich and varied facade effect and makes the simple "box" have a unique charm.Panel space display refers to the combination of wood panels from the plane dimension to the space dimension. The most common one is the folding form,the wood board adopts the folding method to form the uneven building skin,by changing the folding angle and the board size can form the skin decoration with different rhythm and rhythm, which has a great dynamic feeling. There is also a kind of plank with different array shapes, which faces irregularly and forms a "virtual surface" and a dynamic epidermis shape alternately between virtual and real.

5.3 Body Interface

The body structure interface refers to the skin shape of the building with the "body type" as the texture feature. The wood block forms the building skin and is similar to the brick, and forms a rich rhythm by stacking.Simple wooden blocks are stacked together in different combinations to form a concave and convex interface with a sense of breathing. The flexible and varied masonry method gives people a sense of agility and vitality, and has a different aesthetic perception.

6. Selection Principle

In terms of applicability, wood is a natural material that is easy to feel, and is widely used in leisure places and buildings such as vacation villas, resort hotels, and cafes.When the wood is darker in color, it will give people a deep and steady feeling. Therefore, dark wood can create a quieter atmosphere in places such as bookstores and tea rooms.

In terms of durability, wood is composed of cellulose, hemicellulose, and lignin, and is susceptible to fungi, bacteria, insects, and the like in a natural environment, and the life of the wood is lowered.Therefore, most buildings use anti-corrosion wood, and the durability of the anti-corrosion wood is greatly increased compared with ordinary wood, which can withstand harsh natural conditions.

In terms of aesthetics, among the main materials commonly used in modern architecture, such as steel, concrete, plastic, and wood, only wood is a relatively intact original form that retains its material, with low energy consumption and no poisonous, non-polluting, easy to process and other characteristics. It has a long growth time and forms a unique annual ring during the growth process, which makes it have a strong vitality and forms an image of “foundation” in people's minds.

The reason why wood gives people a sense of warmth is not only because of its good thermal insulation properties, but also because its natural color is warmer, especially in the sunshine, it is easy to give a warm psychological feeling, so the environment created by wood is easy to give people a sense of comfort, both physically, psychologically and aesthetically.

7. Summary

Wood plays a vital role in the aesthetic expression of the building's skin, and it has created a series of masterpieces.Wood has strong compatibility and flexibility, and can be perfectly blended with different materials. It creates different spatial atmospheres through color, texture, light and shadow changes and combinations. It is elegant, intimate, green and energy-saving. Can give people a relaxed, soft psychological feeling.The aesthetic characteristics of the wood skin are not exhausted by the above description. In short, the wood is a skin material with excellent aesthetic characteristics and has a unique material charm.

References

[1]. Liu Chaoying, "Classic Building Skin Material",China Electric Power Press,January 2014.

[2]. Ji Xiang, "Building Skin Language", China Building Industry Press, March 2011.

[3]. Guo Honglei, “Cognitive Approach and Construction Method of Modern Building Skin”, China Building Industry Press, August 2014.