The Application of Bionic Design on Daily Ceramic Design

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Keywords: Ceramic design, Bionic design, Modern daily necessities

Abstract: Bionics is an emerging fringe subject developed based on biological sciences and technical sciences, while bionic design is an emerging fringe subject based on bionics and design. Bionic design involves biology, anthropology, and psychology. In a sense, bionic design is the development and continuation of bionics and the direct presentation of the research results of bionics in many related disciplines, such as science, color science, aesthetics, materials science, morphology, and biology. As one of the fusion methods of human social production activities and nature, bionic design has gradually become a new bright spot in the development of design science. People's aesthetic culture tends to be natural and authentic, and designers must also conform to the aesthetic development of the times, carrying out a new thinking on the design of daily-use ceramics, whether it is life philosophy or aesthetic attitude, it must be more inclined to natural style. The article mainly discusses the application of bionic design in daily ceramic design.

1. Introduction

Biomimetic design can be divided into two categories. One is bionic engineering design, which mainly focuses on object function design. In the development and application of product science and technology, natural biological shape features or special unique functional features are introduced to improve the performance of industrial products. Functional performance; the other is bionic art design, which simulates and extracts the characteristics of natural organisms based on the perspective of art design, and designs products that meet people's aesthetic characteristics. Bionic engineering design pays more attention to product functions, while bionic art design is more inclined to the aesthetic value of products. In the bionic design of daily-use ceramics, it is necessary to realize the mutual penetration and unification of functional utility, material technology and aesthetic appearance. The use of glaze designs with different properties and different characteristics, the use of modern molding technology, firing methods, etc., to design rich artistic effects Ceramic products for daily use. In the design of daily ceramics, the application value of bionic design can be summarized as follows:

First, it reflects the humanistic care of the product. The application of bionic design in the design of daily-use ceramic products can integrate the functions and forms of natural creatures into it, and reflect unique spiritual connotations. It can not only shorten the distance between consumers and products, but also make consumers close to nature. Feeling, so that consumers obtain aesthetic satisfaction, physical and psychological comfort needs. Second, cater to the city and improve the comprehensive competitiveness of commodities. Daily ceramics occupies an important position in people’s lives. They have many advantages such as high temperature resistance, easy cleaning and corrosion resistance. However, with the continuous improvement of people’s material living standards, consumers’ requirements for daily ceramics are no longer limited to them. Functional requirements have also put forward higher and higher requirements for its aesthetic effect, and the application of bionic design in daily-use ceramics can not only optimize and improve the quality of daily-use ceramics, but also increase the interest and aesthetics of the product, which can be more To better meet the needs of consumers and improve the market competitiveness of products. Finally, the inheritance and development of traditional cultural elements. The bionic design of daily-use ceramics incorporates a wealth of traditional cultural elements. For example, the “lotus” element widely used in daily-use ceramics design represents Gaojie in Chinese culture. Lotus patterns and honeysuckle patterns can be seen everywhere, so bionics The application of typical

  DOI: 10.25236/iccemm.2021.004

traditional elements in the design is also the continuation and development of traditional culture.

2. Features of Bionic Design of Daily Ceramics

Specifically, the bionic design of daily-use ceramics reflects the following characteristics:

2.1 Diversified Manifestations

The application of bionic design for daily ceramics mainly uses simulation methods to design ceramic materials into natural images to express people's cognition of objective things in nature and their feelings about the world. There are two main manifestations of the bionic design of household ceramics:

One is the concrete form of expression, that is, relying on the form of the concrete object, reflecting the essential attributes of the matter, with details and more concrete images, reflecting strong realism. For example, mountains and rocks, water marks, animal and plant lines are designed according to the prototype, without refining and processing. The concrete expression will give people a vivid, free and irregular feeling. The concrete form of expression retains the characteristics, individuality, characteristics, and typicality of the natural form, but the work does not simply imitate the original form of natural objects, but summarizes and sublimates the biological shape, making daily-use ceramics more aesthetic value. The second is abstract expression. Abstract bionic design is to extract the image of natural objects, and extract the relatively independent essential attributes of natural objects to be used in daily ceramic design. The abstract bionic design embodies the particularity of thinking activities. It relies on the “shape” but does not express the specific “shape”, but shows the “image” that transcends the natural form. Compared with concrete and realistic bionic design works, abstract design can better reflect the designer’s design style and ideological connotation. The designer uses “metaphors” to make people associate, and the use of notes can perceive the natural body in the process of using the product. The attributes of the people, so as to obtain a deeper spiritual enjoyment and emotional satisfaction. Abstract bionic design is more formal, artistic, and more intriguing. It is the mainstream trend of future ceramic design development. Of course, there is no clear boundary between abstract bionics and concrete bionics.

2.2 Symbolic Features

Symbolism is one of the common methods of artistic expression. Symbolism refers to marking a specific natural thing or figure on a road with a specific meaning. Daily ceramics have been influenced by traditional history and culture for a long time after a long historical change. Religious culture also has a long-term impact on them. Therefore, the bionic design of daily ceramics must not only have the characteristics of natural affinity, but also have strong The symbolic characteristics of the meaning of is mainly reflected in the following two points:

One is religious meaning. Decoration is an important part of the bionic design, and the decorative bionic design not only satisfies the user's visual aesthetics on the appearance of daily ceramics, but also further expresses the symbolic meaning it carries. For example, the lotus and honeysuckle that were often used in daily ceramics in the Southern and Northern Dynasties are typical Buddhist cultural symbols, with a strong Buddhist artistic color. On the one hand, the bionic design bears the symbol of auspicious meaning. The bionic objects of daily-use ceramics are often supported by certain cultural symbolic meanings, rather than arbitrarily chosen. Designers should choose suitable subjects according to people's special preferences. Chinese culture emphasizes the love of life and the importance of the present rather than the past. Therefore, the Chinese people's consciousness and concepts include the yearning and wish for a better life. Common flowers, birds, insects, and beasts in daily ceramics all have auspicious meanings. For example, plum, orchid, bamboo, and chrysanthemum symbolize nobleness and gentleman's style, and have noble, elegant, and elegant symbols; old birthday stars in myths and legends Symbolizes longevity; mandarin ducks have always been a symbol of loyalty, and pomegranate represents many children and many blessings. These all imply the yearning for a better life in the hearts of the Chinese people, and

contain good wishes for good luck.

2.3 Characteristics of Emotional Communication

Different people's life backgrounds and different cultural environments will produce different ideologies and life customs. These objective differences determine people's semantic understanding of daily ceramic bionic design. But no matter how big the difference is, people's pursuit of beauty is the same. Therefore, the bionic design of daily-use ceramics also bears the characteristics of emotional communication. The creativity of daily-use ceramic bionic design is conveyed to users through elements such as form, color, texture, etc., to realize the coordination and matching of people, works and the environment, so that consumers can have psychological feelings such as cordiality, comfort, and pleasure. This is also a bionic design. final goal. Therefore, the bionic design of daily-use ceramics must not only create works that meet human pleasure and emotional desire, but also achieve emotional resonance with consumers through information that is understood by humans, and give full play to the value of bionic design.

3. The Application of Bionic Design in Daily Ceramic Design

As mentioned above, bionic design is a marginal subject developed on the basis of bionics and design. It mainly studies the form, function, color, texture, and spiritual connotation of natural things, and applies it to the field of design rationally. Because it takes natural things as references, the designed products, functions or forms have the characteristics of natural things. The design procedure of bionic design mainly includes the following two aspects. One is the bionic design from challenge to biology, that is, first observe the characteristics of the organism itself, and extract the elements that are beneficial to the design based on the analysis and design principles or abstract applications , To discover the potential applications of the organism itself and apply it to product design. For example, the flight of birds in nature inspired people to design aircraft by simulating the wings of birds. In this process, the bionic design is based on the order of nature. On the other hand, from biology to bionic design, that is, the designer has understood the functional problems that the product design needs to solve, determines the use situation of the product, and then discovers the prototype suitable for the use situation of the product from the organism to determine the bionic object. Finally, according to the shape, feature, color and structure of the bionic object, the original object is selectively extracted and processed, and then applied to the design product. Specifically, the application of bionic design in daily ceramic design mainly starts from the following aspects:

3.1 Shape Bionic Design

The modeling of daily-use ceramics is started in the simulation of biological morphological characteristics. Daily-use ceramics only meet the functionality and convenience of use. The form is simple and monotonous. The use of bionic design in daily-use ceramics can improve the aesthetic value of products. In the process of using, you can feel the influence of beauty and achieve physical and mental pleasure. The ups and downs, connections, transitions and other changes of the bionic modeling of daily-use ceramics are constructed through points, lines, surfaces and other constituent elements:

First, the application of midpoint in bionic design. The points in the daily ceramic modeling are intuitive and specific. Most of them have a specific size at a specific location, including a certain area and volume, and even shape and color to meet the requirements of visual elements. For example, flowers are a very common shape in daily ceramic design. Many petals form part of the overall shape, and the position where the petals meet will form a continuous point. This is the application of the midpoint of the daily ceramic bionic design. Of course, these points are located at the key point of the shape, the concentration of the line and the surface, which will attract people to the position where the target stays. Secondly, the application of bionic design lines. In comparison, the performance of lines in the bionic design is more obvious. The concept of lines includes intuitive lines and abstract lines. The so-called intuitive lines refer to specific line segments with a certain length, and the abstract lines refer to ceramics. The image edge of the shape. The application

of lines can express the morphological characteristics of ceramic works more concretely. According to the geometric classification method, the line includes two categories: straight line and curve. Straight line is less used in the design of daily-use ceramics, and more is the application of various curves. The shape of the curve is more saturated, euphemistic, undulating and fluid. specialty. Finally, the application in bionic design. The surface occupies the largest position in the whole form of daily-use ceramics. People usually see the surface in the whole form directly, so the design of the surface is more likely to directly infect people's emotions. Various shapes of surfaces are common in the bionic design of daily-use ceramics, such as spherical surfaces, pebbles free-curved surfaces, and diamond free straight-line surfaces.

3.2 Texture Bionic Design

Texture refers to the texture of the surface texture of an object. It is the surface organization of various objects with different tactile feelings. It is an objectively existing form and appearance. The texture of an object includes texture, grain, texture, luster, traces and other microscopic appearances. The texture reflects the difference between different objects. The bionic design of the texture in the daily ceramic design is mostly used for decoration, such as the texture of wood, the mesh texture of leaf veins, the rough edges and corners of stones, etc. The manifestation of bionic texture design mainly includes the following two types:

One is the overall or partial realism of the texture of a certain object, such as splashing, splashing texture effects, or dense texture of fingerprints. Enlarging fingerprint texture can show a very unique artistic beauty; In the design of tea sets, you can often see decorative patterns formed by casting stones. The irregular shape of the stone and the rough texture of the stone surface can make the design closer to nature, and give people a strong visual impact, which is easy to attract. People's eyes. The other is through the glaze color or kiln to become a special texture, such as cracking effect, cracking effect, etc., this kind of deliberately pursued special texture is more widely used in daily ceramics. For example, the ceramic surface is fired with rabbit fine glaze to obtain the texture like gray rabbit fur; or the rain flower stone texture designed by the method of twisting and kneading the color mud. Texture bionics enriches the decorative effects and forms of daily ceramics, enriches people's aesthetic experience when using ceramics, and evokes different psychological responses of users from various aspects such as vision and touch.

3.3 Functional Bionic Design

The use value in daily ceramic modeling design is the foundation and the primary consideration for designers. Therefore, in a sense, function is the limiting factor in daily ceramic modeling design. Many designers may have functional considerations and ignore the design. The beauty. In response to this situation, bionic design can be used to organically unify functional and aesthetic values. The bionic modeling of daily-use ceramics will have an impact on the functional results of ceramics. The modeling should be subordinate to function and the design principle of form subordinating to function. The bionic design of daily-use ceramics expands the categories and meanings of functions, creates rich forms, and serves the beauty of functions. The bionic design adopts biological forms that adapt to natural evolution, so that it has excellent structural functional characteristics, physical characteristics and chemical characteristics. The basic functions of daily ceramics are realized through the reasonable combination of various parts of the structure. Each part has a reasonable division of labor and clear tasks. Not inferior to standardized and systematic functionalism.

3.4 Color Bionic Design

The daily-use ceramics on the market have a variety of colors, and different types use different tones. For example, ceramic tea sets are mainly elegant and plain. This is because the delicate fragrance of tea complements the clean and clean porcelain, so the tea sets are mostly white. blue. Color is an important aesthetic object of daily-used ceramics. The quality and color of ceramics, the glaze of porcelain, the color of pigments, etc., are all important carriers that reflect the artistic quality of daily-used ceramics, and also evaluate the artistic value of a daily-used ceramic work.

Important standards. Different glaze colors will give people different visual sensory stimulation effects, and the color of ceramics is also a direct manifestation of the author's emotional and environmental characteristics. In the process of making ceramic products, factors such as the thickness of the glaze layer, the firing temperature, and the placement position will directly affect the glaze color, and the bionic design of the ceramic color should choose the appropriate glazing method according to these factors. The relevant theories of color interpretation involved in the color bionic design of daily-use ceramics are very rich, including color emotional tendency, color meaning expression, color classification system, cultural and national characteristics of colors, etc., but no matter what the theoretical system, color bionics Designs must reflect the true colors of life in nature. Even if the true colors of life in nature are to avoid risks, capture food, and survive, direct application in design is also a relatively low-level color application, but for designers, There are still many things to learn from.

4. The Development of Bionic Design Technology for Daily Ceramics

Bionic design is a very important concept in the field of daily ceramic design, and with the continuous penetration of environmental protection concepts, simulation design will become an important development direction in daily ceramic design, specifically in the following two aspects :

On the one hand, the design concept must be innovative. In modern life, daily-use ceramics are not only an indispensable and important part of people’s lives, but also the sum of material, technology, aesthetics, customs and culture for thousands of years. As the creator of culture, human beings have achieved cultural inheritance. And development, but at the same time will be imprisoned by the culture created by oneself. In the long process of human social development, the collision of old and new ideas and the alternation of old and new things are important factors in the development and innovation of culture. It is people who continue to break the solidified cultural model and break through the shackles of old traditions that promote humanity. Continuous development of culture. Under normal circumstances, most people are still immersed in traditional concepts during the sprouting period of new ideas, new situations, and aesthetic consciousness, and designers must become brave enough to break the framework of the predecessors and awaken people from the shackles of the old model. The pioneers of, created more shocking design works with their own brand-new concepts and innovative designs. At this stage, bionic design is undoubtedly one of the most effective and revolutionary methods.

On the other hand, more diverse methods have been developed. In actual design, designers can use some simple methods to make their designs more creative and innovative. Commonly used methods include close-up method and combination method. The so-called close-up method is to learn from the concept of close-up shots in movies or photography, intercept a part of the whole of a certain organism, express the whole with typical parts, or decompose the prototype, and select representative local features for design. In the bionic design of daily-use ceramics, we often see that many utensils are bionics with partial shapes. Although they are partial depictions, they can also be viewed from a small scale to fully express the integrity and artistry of the entire bionic design. For example, the coffee and tea set specially designed for children, the designer has carefully designed the shape without any edges and corners, and the shape components are more soft and delicate. The coffee pot cover adopts a bionic bird-shaped lid twist, which narrows the relationship with the child. Distance, the whole set of works is entirely from the perspective of children, to achieve coordinated processing from details to the whole, so that children users have a unique sense of kindness to the product. The so-called combination method refers to the combination of the physical characteristics and texture characteristics of different natural objects according to specific formal laws and aesthetic characteristics to improve the integrity and unity of the entire ceramic work design. Thousands of organisms in the natural world are an inexhaustible treasure for designers and a great source of artistic design. In the field of bionic design, innovation is endless and worthy of designers. Go bravely explore and keep trying. The simulation of the shape of natural objects is only the starting point rather than the end point of the design. The designer should start from the bionics, gradually realize the reconstruction of the form, and finally completely present a ceramic work with

more artistic and aesthetic value. Although for designers, this road of struggle and running-in between man and nature is full of difficulties, pains and adventures, but at the same time they can also reap happiness, peculiarities and challenges. This is precisely the charm of bionic design.

5. Conclusion

In short, in the bionic design of daily-use ceramics, the aesthetic form is based on the consideration of the aesthetic point of view, the functional form is based on the consideration of the intellectual angle, and the emotional form has a strong subjective will and emotion. Therefore, the bionic design of daily-use ceramics must ensure its basic The use of functions, but also into the natural beauty and the designer's own emotional factors. Biomimetic design is an important means in the design of daily-use ceramics. Product semantics should be fully considered in the concept of bionic design, and the relationship between the bionic object and the product should be established. This relationship is not only the relationship of function or form, but also the relationship of content; Refined selection or high-level generalization of bionic objects, including form, texture, function, etc., and then high-level generalization and refinement of these elements, to give full play to the application value of bionic design in daily ceramic design.

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