

Explore the Bionic Design in Modern Packaging Design

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Abstract: With the emergence and popularization of modern new technologies and new materials, the homogenization of products is becoming more and more serious, and the psychological needs of consumers are becoming increasingly "picky". How to make products from the sensory response to win good feelings is particularly important, and this also indirectly puts forward more personalized and more visually influencing design requirements for the packaging design of products. This paper firstly summarizes bionics and bionic design. Secondly, it summarizes bionic packaging design from the role of bionic design in modern packaging design and the principles of modern packaging bionic design. Finally, from the five aspects of form bionics, color bionics, texture bionics, structure bionics and function bionics, the application strategy of bionic design in packaging design is analyzed by using excellent bionic packaging design cases at home and abroad. Bionic design has been concerned and loved because of its close to the natural image, this paper aims to explore how modern bionic packaging design can make it stand out in the dazzling array of the same type of products, can be more favored by consumers, and finally realize the circulation and value of goods.

Keywords: Package Design; Bionic Design; Morphological Bionics; Color Bionics; Texture Bionics

1. Introduction

With the development of modern science and technology, the production of products is more efficient, which also leads to the homogenization of goods is becoming more serious. When consumers choose a product, how to make it stand out in the dazzling array

of the same type of products, it is particularly important. In many products of the same quality, the shape packaging image will largely affect the choice of consumers. Luigi Corani, the father of modern bionic design and a famous German design master, once said: "The basis of design should come from the truth presented by the life born in nature ^[1]." Bionic design has been concerned and loved because of its image close to nature, so it is also feasible and practical to explore the integration of bionic design into modern packaging design.

2. Overview of Bionics and Bionic Design

2.1 An Overview of Bionics

The term "bion" was first used by Jack E. Steele of NASA in 1958, and "bion" is derived from the Greek word meaning biological individual, biological type. In September 1960, the first Symposium on Bionics was held at the Ohio Air Force Base in the United States, at which Jack Steele proposed that "Bionics is the science of systems that are based on biological systems and have or resemble the characteristics of biological systems." Bionics is then defined as "the science of building technological systems that mimic biological principles, or of making man-made technological systems with characteristics similar to those of organisms." ^[2]

The research of bionics in China is later than abroad. The first bionics conference was held at the Chinese Academy of Sciences in Beijing in 1975. In 1977, at the National Natural Science Discipline Conference, China's bionics research plan was formally formulated ^[3]. So far, bionics has been widely used in all walks of life in our country, such as product design, packaging design, furniture design, architectural design and so on.

2.2 Bionic Design Overview

Bionics Design (Bionics Design) is a new discipline developed on the basis of the

interdisciplinary integration of bionics and design. Specifically, "Bionic design is the innovative design that simulates and draws lessons from, or scientifically analyzes and abstracts the form, texture, structure, color, function and other aspects of objects in nature." [4] Bionic design according to its properties can be divided into: "form bionic, functional bionic, structural material bionic, color bionic and texture bionic." Among them, morphological bionics is the most common and widespread application." [5]

3. Bionic Packaging Design Overview

3.1 The Role of Bionic Design in Modern Packaging Design

China's packaging field is developing rapidly, the market variety is too dizzying, product packaging update iteration is particularly frequent, if there is no unique content and form, it will soon disappear in the industry. [6] Bionics provides rich materials and reliable theoretical basis for packaging design from a scientific and rational perspective, and inspires designers' design inspiration [7]. Most people have original trust and love for natural creatures. This is also the reason why bionic design is the most widely used and most representative in modern packaging design. Therefore, the bionic design concept based on natural organisms will be one of the important ways of packaging design. Morphological bionic packaging design is the most used and the earliest, its bionic characteristics are: local bionic, overall bionic, abstract bionic, figurative bionic and so on. The bionic design of packaging design mainly uses anthropomorphic and exaggerated techniques. The application of bionic design in packaging design, not only makes the product packaging more friendly and interesting, has a strong design beauty, easy to attract the love of consumers, and its high recognition allows consumers to quickly choose, can effectively enhance the market competitiveness of goods.

3.2 Principles of Bionic Design of Modern Packaging

The first principle of modern packaging bionic design is people-oriented, which is closely related to the most basic function of packaging. The most basic functions of packaging mainly include the protection of

products, easy to carry, easy to use and transport and promote sales, etc., which are built on the basis of ergonomic knowledge of "people-oriented". Packaging should be based on the characteristics and characteristics of the product, determine the corresponding consumer groups, according to the characteristics of consumer groups, such as gender, age, occupation and income factors, combined with the needs of the market and products, the use of ergonomics knowledge, packaging design is the packaging that consumers need. At the same time, excessive packaging should be avoided to avoid the phenomenon of "buying casket and pearl".

The second principle of modern packaging bionic design is to meet the requirements of social development, mainly referring to the aesthetic and environmental protection of packaging design. With the increasing aesthetic requirements of consumers, bionic packaging design naturally should also meet the aesthetic needs of consumers, will win the favor of consumers, and occupy a place in the market economy market. In recent years, the popularity of green packaging design continues to rise, such as the proposal and application of the concept of "natural" and "return to nature", is the designer's reflection on the environmental and ecological damage caused by modern civilized activities and design practice [8]. Bionic packaging design in addition to the use of the most original and natural materials, with the continuous upgrading of technical means, more new environmentally friendly materials have been invented, because of its degradable and recyclable advantages, is also widely used in modern packaging design, which is also the original concept of bionic packaging design.

4. Application Strategy of Bionic Design in Packaging Design

The famous Australian designer Tony Ihbotson once said: "Nature is the best packaging designer." [9] Bionic design seeks the meeting point of human survival mode and concept, social production activities and nature, so as to achieve a high degree of harmony between human society and nature. [10] Bionic design should be based on packaging products and characteristics, age and gender of target consumers and other characteristics of the design of targeted packaging. This part will

discuss the application strategy of bionic design in packaging design from the aspects of form, color, texture, structure and function.

4.1 Morphological Bionics

Morphological bionic design is a kind of design that is expressed by the form in nature, and interprets a kind of artistic conception and a kind of language with the overall external image of its design. ^[11] Morphological bionic packaging design is the most widely used design technique, mainly imitating the shape of objects in nature, as the external shape outline of packaging, very interesting.

Evian Natural mineral water packaging (Figure 1) is a series of commemorative bottles launched by Evian from 2005 to 2007 - the Fountain of Youth. The source of Evian natural mineral water is the small town of Evian, France, backed by the Alps, facing Lake Lemén, away from any pollution and human contact. The packaging form of this series is the use of Evian's new Alpine snow peak shape, crystal clear glass bottle body, symbolizing the source of Evian. The irregular glass bottle body is pure and clear, and the high-purity and high-brightness red and yellow bottle caps form a clear contrast, full of artistic flavor. The whole package adopts a minimalist style, which reflects the beauty of ingenious design and exquisite craftsmanship.



Figure 1. Evian Mineral Water Packaging, Image from Design House Website.

4.2 Color Bionics

As the saying goes, "Look far at the colors and close at the flowers." Color bionics conveys product information through the use of colors in nature, which is a more abstract design expression in modern packaging design. Different colors convey different emotions and meet the psychological needs of different consumers. Liang Jinming believes that in modern packaging design, the bionic color integrates aesthetic, decorative and symbolic ^[12]. The aesthetic nature of color bionics is one of the most direct, the fastest and the most intense, and the most important ways to attract the attention of consumers. The decoration of

color bionics mainly refers to the reproduction, fragmentation, deconstruction and reconstruction of material colors in nature, and the application of the reproduction, fragmentation, deconstruction and reconstruction of colors to modern packaging design to display the characteristics of goods and packaging. The symbolism of color bionics is the most abstract, such as expressing leaves and grasslands with green, symbolizing environmental protection, ecology, freshness, peace and growth; Red expresses the sun, fire, etc., symbolizing life, passion, sunshine and warning; Blue expresses the sky and sea, symbolizing calm, technology, speed and reason. Black expresses night and symbolizes darkness, terror and fortitude.

Packaging color must be attached to the graphics. Quick Jelly series packaging (Figure 2). The patterns and colors of this series of packaging use the graphics and colors of fruit kiwi and orange respectively, and the graphics and colors of fruit kiwi and orange are very real. At the same time, the packaging container is also designed according to the shape of kiwi and orange, the combination of form bionics and color bionics not only makes the visual impact of the packaging, but also reflects the "original flavor" and freshness of Quick jelly.



Figure 2. Quick Jelly Series Packaging, Picture from the Internet.

In the process of color bionic creation, we must first accurately grasp the color of the bionic object, then master the color matching of the whole package, and finally restore the proportional relationship of the bionic object color in order to accurately reproduce the color of the bionic object.

4.3 Texture Bionics

The texture bionics of modern packaging design is that the designer simulates and restores the texture and texture of the biological surface by imitating and learning from the texture of natural organisms as the appearance package of commodities. ^[12]

Texture bionics is a relatively novel design method in modern packaging design, which uses different textures and textures of different creatures in nature to bring different psychological feelings and reactions to people. Texture can be divided into visual texture and tactile texture ^[13]. Visual texture is the surface features of objects that can be seen at a glance. Tactile texture, on the other hand, is the cognition generated by touching the surface of an object. Visual texture and tactile texture are both independent and closely linked, and they are often integrated and applied in packaging design.

Naoto Fukasawa Company designed the packaging of the beverage box with the imitation of fruit surface texture ((Figure 3). The design of the beverage box uses rubber materials to imitate the fluffy surface texture and texture of the fruit kiwi, so that consumers can intuitively feel the taste of the kiwi fruit in the beverage. At the same time, the packaging gives people the fluffy surface texture and texture, so that consumers want to reach out to touch the packaging, verifying whether the feeling is the same as the feeling of touching the real kiwi. The beverage box packaging uses visual texture and tactile texture, whether in the visual sense or in the tactile sense of natural beauty, has successfully mobilized the curiosity of consumers, is a very successful texture bionic packaging design work.



Figure 3. Beverage Box Packaging, Image from the Internet.

4.4 Structural Bionics

The structural design of packaging is based on the product's attributes, external environment, audience, time and other different elements, using different materials and different product technology to design the internal and external structure are scientific and reasonable container items. ^[14] The structure bionics principle in modern packaging design is to organize and adjust the relationship between the whole package and various parts by simulating the biological structure existing in nature ^[15]. The structural bionics in packaging

design requires that the whole or local structure of the simulated object is very familiar, so that the structure can be correctly transferred to the packaging design during creation, with new ideas.

Orangutan cardboard box (Figure 4), using the head of the animal orangutan as the pattern of the cardboard box, and borrowing the structure and position of the nostrils used by the orangutan to breathe, as the opening way of tissue extraction, each paper extraction is like an orangutan exhalation, but also like the orangutan "snot" being extracted, with "similar" wonderful, so that consumers have the use of the cardboard box, Can have a more relaxed sense of pleasure.



Figure 4. Guess the Cardboard Box. Image from the Internet.

4.5 Functional Bionics

Functional bionic design mainly studies the functional principles of things existing in nature and organisms, and uses these principles to improve the original technology and develop new technologies, so as to speed up the replacement of products. ^[16] Functional bionics is a relatively novel method in modern packaging design and has great significance. Functional bionic packaging design mainly uses some functional principles of things in nature or organisms to improve packaging design, promote the update and iteration of packaging design, so that packaging is both useful and interesting.

Starlight bear shaped children's water cup (Figure 5) is a water cup created by using functional bionics. The overall shape of the water bottle is the use of cartoon image star bear, the use of star bear head can nod the function, ingeniously combined with the opening and closing of the water bottle cap. At the same time, the children's water bottle in the shape of starlight bear not only satisfies the children's childlike interest from the lovely cartoon shape, bright and strong colors, but also can capture the youth group who also

have childlike innocence.



Figure 5. Starlight Bear Shape Children's Water Bottle, Image from Taobao.

The form bionics, color bionics, texture bionics, structure bionics and function bionics in packaging design are not only independent and existing and applied, but also the comprehensive application of several bionics techniques, especially the color bionics often accompanied by the form bionics and the color bionics often accompanied by the texture bionics.

5. Conclusion

In the modern fierce market environment, as well as the psychological needs of consumers increasingly "picky", the bionic design into the modern packaging design, so that the packaging is more humane, affinity and interesting, not only easy to attract the attention of consumers, can positively stimulate consumers' desire to buy, effectively improve the sales share of goods, while the unique bionic packaging design form, It can also reduce the risk of inferior imitation of products to a certain extent, and indirectly maintain normal market competitiveness.

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