Research on the application of commodity packaging design in the information age

Lin Liu[1], Zhuoying ZHU[2]

School Of Art Design, Hubei University Of Technology, Wuhan, Hubei Province, China

[1]102101185@hbut.edu.cn
[2]1761788095@qq.com

Abstract. The processing of materials and structures in packaging design is the reflection of economic activities in application. When in the pursuit of artistic style, if packaging design only stresses the unique form of personality expression while ignores the visual beauty and practical use with general rough processing, it could be detrimental to the marketing of products. At the same time, in the case of increasing market competition, consumers for packaging design requirements are becoming higher and higher, therefore, this paper according to the packaging design of materials and structural characteristics, elaborated the principle of container design and the application of materials. And through the information concept to increase the added value of commodity packaging, in order to promote the sales of commodity packaging.

Keywords: package design: material and structure; product packaging; information concept

1 INTRODUCTION

Packaging design is a kind of creative activity that satisfies certain product attributes, container structure, material, production process and other demands in the process, its design thinking and the creative process are influenced by business competition, social culture, folk custom, aesthetic value, production process, practical value and economic value, which requires the understanding and research in the design process, by integrating the concept of information, we can create excellent works that can not only reflect the value of commodity culture, but also adapt to the production technology.

2 THE DESIGN PRINCIPLES OF CONTAINER

Given different product packaging presents various structure and form, it is necessary to take into account the shape, material, process, protection function, aesthetic factors and so forth in terms of container design. The packaging needs to be combined with the characteristics of products for targeted container design.

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2.1 THE CRAFT OF CONTAINER DESIGN

The modeling of artistic packaging container should attach importance to practical craft as well as simple production. Those are hard to be put into production with solely artistic value have no economic value. Such problems are commonly seen in many students' packaging design homework, who tend to ignore the production process and overly pursue artistry, as a result, their well-designed shape is impossible to be produced or greatly increase the cost. [1] With complicated mold in the production process, it could be impracticable in actual production.

Excellent packaging design should be featured by simple process and convenient operation which can as far as possible apply the production line process while avoid manual operation. Certainly, in the packaging container structure, some special packages still need craftsmanship to achieve the desired effect. This is the reappearance of the traditional packaging form, which calls for further exploration in our study.[2] The ultimate purpose of practical container design is to facilitate the application in life, and in the process of handling and storage, the packaging will not be impaired with simple operation and recycle process for lower costs.

2.2 PRACTICALITY OF CONTAINER DESIGN

The practicality of packaging is indeed directly reflected in the economic benefits in the end. For instance, the excessive emphasis on artistic effect in packaging design, some container (like bamboo-shaped form) is designed in a spindly model that can be easily broken and lose practical value. Some containers are small yet the outer packaging box is big, or the handle is not fixed, etc. All these designs may cause inconvenient in practice. Moreover, the shape design of some packaging containers is too complex that the process is cumbersome, then the packaging cost and commodity value become inconsistent.[3] In short, the practicality of packaging containers is based on the principle of protection and convenience.

Unique and aesthetic container modeling is one of the main traits indicating the personality of a product, like the traditional container modeling design of sauce products, it usually has few decorative patterns, but focuses on the uniqueness of container design to attract the attention of consumers. [4]As there are many similar products, container images should be distinct, diversified and multi-angle, with aesthetic effect in form to impress consumers. Besides, the uniqueness of packaging should be designed without affecting the function of the container and the characteristics of products. The ultimate purpose of container modeling design is for the convenience of sales and use, if the commodity packaging design is solely in the pursuit of traditional style with antique shape and personality expression, ignoring the visual beauty in rough and general processing, which is eventually unfavorable to product marketing.

3 THE DESIGN PRINCIPLES OF STRUCTURE

In semantic terms, structure refers to the proper collocation and arrangement of components, or the structure of a building that bears gravity or external forces. From the

perspective of packaging design, one is the combination and collocation of each part of packaging (container and foil); The other is the structural relationship between the weight of the goods and the pressure of the packaging, and the way to address the structure and shape of the packaging.

3.1 APPLICATION OF PACKAGING STRUCTURE

Packaging structure design includes single piece, combination, open window, outer packaging structure and other types, the structure can be designed on the basis of the protection and application function for targeted effect. Such as the traditional packaging of "Dieda pill" structure, each pill is first wrapped with cotton paper, then covered with a spherical plastic box after wax, and put into the paper box, the 6 pills of four layers are put in a box with the structure of inner packaging-middle packaging-outer packaging. [5] Rake ordinary wine packaging as another example, ordinary wine only has a bottle, middle-class wine contains an extra box, while the packaging of high-end wine not only has unique container, but adopts exquisite material, there are corresponding decorative objects to enhance the added value.[6]

Paper packaging is the most widely applied form with most structural changes, including paper bags, paper boxes, paper tubes, paper plates and special forms of paper boxes. Paper bags are generally used for simple food or herbal reagents; Paper boxes are mainly applied for gifts, handicrafts and wine. Paper tube is commonly used as wax paper, rice paper and firecrackers and other traditional products packaging; Paper plate is for fragile goods cushioning packing; Special form of carton structure is on the basis of the normal carton structure of the processing changes, which makes full use of the elasticity and molding characteristics of paper, combined with the form of goods to create a novel, unique carton packaging form, such as heterosexual, integrated, POP, easy-open packing and so forth. Paper packaging design also has its defects, such as the weight and size of goods will have certain requirements, which are not suitable for high-end gifts.

3.2 THE FORM OF STRUCTURAL MATERIALS

Composite material structure. Composite material refers to plastic, paper, fiber fabric, aluminum foil, adhesives and other materials, according to a certain proportion of the relationship and processing of composite new packaging materials. It is usually composed of outer protective layer, isolation layer and inner protective layer, and the appropriate adhesive is used between layers(Figure1). In packaging, such form is oftentimes adopted as food packaging bags with protect function, or to imitate traditional packaging shape with designed shape (Figure 2).

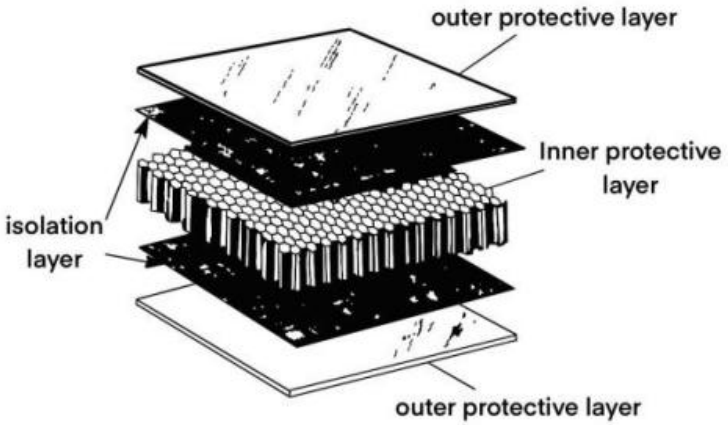

Fig. 1. Composite material structure.

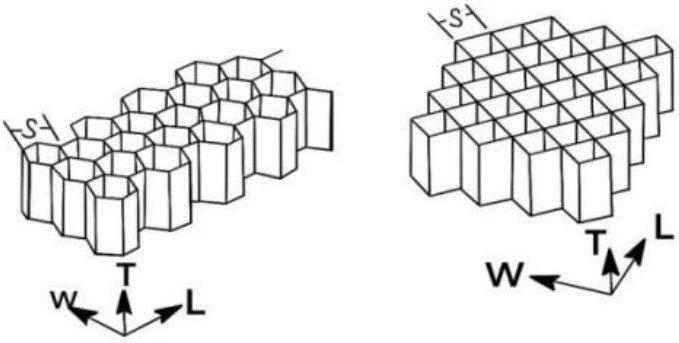

Fig. 2. Internal material.

Wood structure. Wood is a common structural form in packaging design. Bamboo, rattan and wheat rods are often used together with wood. Wooden boxes are mostly chosen for packing precious products (famous wine, medicine, cultural relics). [7]For nail cover type, buckle cover type, pull cover type and so on. The material of wooden box basically has fir, northeast pine, plywood, camphor board, sandalwood board to wait. Bamboo products structure forms of bamboo basket and bamboo tube can be used for product packaging with local characteristics to highlight the unique flavor of good.

4 THE APPLICATION PRINCIPLES OF MATERIALS

Nowadays, the development of packaging has included wide use of materials, from natural materials to artificial packaging materials, from single materials to synthetic materials, which has brought great convenience for commodity packaging. The selection and application of packaging materials should follow the scientific principles of practicality, economy, beauty and convenience, and the main performance principles should be reflected in function, texture, color and beauty.[8]

Material function and texture. Material function is the comprehensive selection of materials from the perspective of commodity packaging protection. Texture is the physical form of packaging material, such as rough, smooth, strong, wet resistance, acid resistance, corrosion, mildew, decay, strong elasticity, folding, all these play a corresponding role in different packaging applications. For example, aluminum foil has the special texture of gold and silver luster effect, which is often used to show the luxury and noble sense of goods. Stoneware, with its rough surface, is suitable for the texture and texture of traditional goods (ancient wine and local products).

The effect of material. The effect of packaging is the unique effect of packaging material itself, which gives people psychological feelings. For example, stoneware container is a kind of material that imitates the original pottery. It has the characteristics of primitive simplicity and can be used in the performance of traditional commodity packaging. [9] The composite material has the characteristics of modern packaging structure and aims to imitate the traditional packaging structure. In the selection of materials should be aimed at the characteristics of goods. Reeds, straw mats, yellow papyrus, bamboo strips and modern composite materials should not to be mixed, otherwise, it would only cause confusion in its style.

The common methods of material application include single method, combined method, substitution method, bionic method and texture effect.

Single method: it refers to a commodity using only one kind of packaging material, like one jin of white sugar packed in a plastic bag or a paper bag can be directly sold to customers. A single wooden box, corrugated packaging, glass bottle, aluminum foil bag, can be applied without other auxiliary materials. From the performance of commodity characteristics, the single use is relatively monotonous, which tend to be used for the packaging of ordinary goods.

Combined method: this method refers to the application of more than two kinds of materials combined into the packaging container, the characteristics of combination is to make use of the advantages of various materials, so as to maximize the advantages and avoid the disadvantages, and meet the requirements of commodity packaging function.

Substitution method: it is to replace a material with a material to achieve the protection and decoration of goods packaging effect. For example, wine, beverage, pharmaceutical liquid goods, multi-purpose glass bottles as packaging containers, now porcelain bottles, aluminum thin, plastic film bags, hard plastic boxes are also chosen for container modeling, so that the packaging shape performs the corresponding change.

Bionic method: it means the imitation and utilization of materials in packaging design, inorganic materials are applied to imitate the form of organic materials. Such as using ceramic imitation bamboo, wood as packaging containers, printing texture effect on paper, showing the characteristics of goods, the packaging form of hard plastic imitation aluminum products, these are only part of the bionic packaging materials. In fact, there are many other textures, including wood grain paper for packaging, corrugated paper, and aluminum thin surface processing, which is a way to produce a specific effect of surface structure on the packaging. As shown in the picture, the lower part of the bottle and the lower part of the packaging box of "Xiangqing Wine" has the texture effect of bamboo weaving, thus strengthening the local taste of the commodity. "Aizhou preserved eggs" adopts corrugated paper to make packaging boxes, it is not only reasonable selection of materials, but also highlights the characteristics of this product3. The application and selection of packaging materials is an integral part of packaging design, which directly affects the quality of product packaging image(Figure 3).

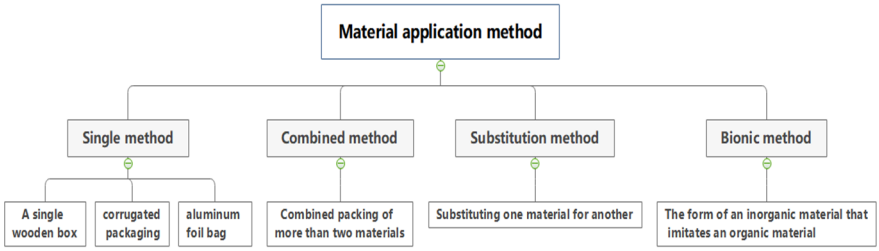

Fig. 3. Application table of materials and methods.

5 THE APPLICATION OF INFORMATION CONCEPT IN PACKAGING DESIGN

With the development of The Times, modern industrial informatization and intelligence are also accompanied by rapid development. In addition to the structure of consumer packaging and material demand has changed. At the same time, it is no longer satisfied with the limited text information on the outer packaging. Innovative design, providing richer product information, product quality traceability system, realize human-machine interaction, improve user experience, is the most direct reason for consumers to choose goods in the information age. Therefore, it is necessary for the designers of our product to integrate the concept of information into the product packaging design, and bring a new information presentation way and more interesting interactive experience to consumers, so that the product can better attract attention and enhance the influence and communication power of the product brand. Like the application of RFID technology in packaging design.

RFID, also known as electronic tags, is short for Radio Frequency Identification. It is an automatic identification technology that can be used to identify the target object through non-contact frequency signals with relevant data, without manual intervention, similar to the wireless version of bar codes.[10] At the same time, RFID technology has the function of bar code, such as magnetism resistance, high temperature resistance, label data encryption, longer service life, longer storage data capacity, storage information can change freely and a series of advantages. On the one hand, it can quickly trace the product quality through the RFID label and query the product freshness, which can enhance the consumer experience and feeling. On the other hand, it can also improve the product management ability of the warehouse, which is more conducive to the connection between warehousing and logistics.

Chicago company OVIE has unveiled a product called Smarterware (Figure 4). It is equipped with smart tags and smart universal connector, which can be viewed through the mobile phone with an application. Each smart tag is equipped with an LED aperture, which can show the freshness of things. For example, green represents fresh, edible, yellow has entered the deterioration stage, it should be eaten as soon as possible, if red, it means that it should be thrown away.

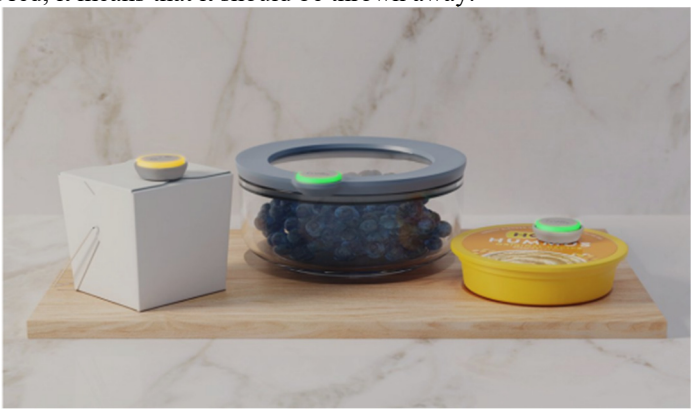

Fig. 4. Smarterware product.

6 CONCLUSION

A great many successful packaging takes its cues from nature. People imitate the natural cover form in packaging design and is still exploring the mystery of nature. Scientists develop biological engineering technology for biomimetic materials, so that they can be applied to various fields. With the advancement of production technology, raw materials are produced into paper, fabric, ceramics and so on through technical processing after countless choices, sublation, and then form a unique environment-friendly packaging, which integrates the implication of simplicity, natural value and environmental protection. Packaging industry should further study how to avoid excessive packaging, including overall excessive packaging and partial excessive packaging. As for packaging technology, high-performance materials and high-tech

packaging technology are in urgent demand, under the premise of ensuring the practical value, the amount of materials shall be reduced while the number of packaging reuse shall be improved, so that the packaging industry can grow in a more environmental way.At the same time, join the concept of information, increase the added value of products. Consumers can also visualize the product packaging, can easily and quickly understand the quality of the product, further improve the competitiveness of the product.

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