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Study on the Appearance Modeling of Modern Industrial Products

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Abstract

Appearance modeling of industrial products integrates with diversity and systematicness. Appearance modeling of modern industrial products shall adopt rational function thinking to guide personalized design expression thus to form aesthetic concept systems on different cultural aspects. Starting from symbol, color and pattern, the paper discussed the characteristics and design methods for appearance modeling of industrial products with the purpose to provide reference for related researches and practices.

Keywords:industrial products; appearance modeling; design methods

1 Introduction

With the economic development and social progress, people have imposed stricter requirements on industrial product design. The appearance modeling of industrial products can intuitively reflect product features and determines the first impression of the product. If the appearance modeling of an industrial product is not special and unattractive, it will inevitably lead to the loss of the audience group and the product will be eventually eliminated in the fierce market competition. It is important to note that appearance modeling design of industrial product is a systematic engineering. Especially under the background of stricter requirements, more factors shall be considered for appearance modeling design of industrial products. Based on the above, this paper briefly discussed the related issues of the appearance modeling of contemporary industrial products.

2 Appearance modeling of industrial products integrates with diversity and systematicness

2.1 Individuality and rationalization of appearance modeling

With the economic development and social progress, people have imposed different aesthetic demands. The appearance modeling of modern industrial products presents diversification characteristics which is an inevitable trend of creation activity development. And appearance modeling of industrial products embodies unification of individuation and rationalization, specifically as shown in Table 1:

Table 1 Individuation and rationalization of appearance modeling of industrial products

Individuation	Rationalization
① Individuation of the product; ② Individuation of the user	Guide the perceptual image thinking with rational logical thinking

Individuation includes individuation of the product and the user. Namely based on satisfying the basic functions, it can reflect the aesthetic value of innovation and emphasize the aesthetic experience of the creator. However, the modeling design of industrial product shall meet the application requirements of the user specific to individual users. Thus it is required to use rational logical thinking to guide perceptual image design to avoid appearance modeling design of industrial products deviating from rational function selection[1].

2.2 Appearance modeling is an aesthetic form

Appearance modeling of industrial product determines physical state of the product presenting before people. It is required to use a variety of means and methods for design and creation in accordance with aesthetic and functional laws. At the present era, information technology has been extensively applied. The appearance modeling of industrial product pays more attention to the interaction between human and substance. It is necessary to satisfy public aesthetic taste. Namely different industrial products have diverse design concept as shown in Table 2.

Table 2 Aesthetic concept of appearance modeling design of different industrial products

Industrial products	Design concept of appearance modeling
Transportation vehicle	Time and space concept
Entertainment utilities	Consumption and mental relaxation concept
Electronic products	Electronics technology concept
Environmental protection equipment	Concept of environmental protection and sustainable development

Appearance modeling of industrial products includes specific "aesthetic" concept. The unique manifestation form has enriched the aesthetic category so that the life contact is more closely related. It covers aesthetic system on art culture, spiritual culture, material culture and other different cultural levels.

3 Methods and trend of appearance modeling design of modern industrial products

3.1 Symbol element

Semiotics believes that any substance can be considered as a symbol system. It is also the same for appearance modeling design of industrial product[2]. Nowadays, people have imposed stricter requirements on appearance modeling design of industrial products. It is not only required to pay attention on product function and price, but also attaches great importance to the connotation and aesthetic value of products. It pursuits of individuation and introduces the personalized symbols to appearance modeling of industrial product thus to manifest product characteristics and unique charm. In addition, it is beneficial to enrich the cultural value connotation.

The symbols can be classified into three categories according to symbolic medium representation object method as shown in Table 3. Refreshing expression form can be presented through innovative expression of a symbol or innovation combination of several symbols.

Table 3 Symbol types and instructions

Symbol type	Symbol instruction
Image symbol	Constitute symbols through simulation or image similarity. For example, product modality substitutes the product.
Presenting symbol	Symbols with causal relationship with the object, such as arrows of road sign.
Symbolic sign	Symbols representing certain implication as universally agreed, such as peace dove.

3.2 Color elements

Color of industrial product can cause strong visual impact on people. In addition, specific color can manifest the embedded value of product[3]. In industrial product design, the application of color is completed with coating material. Color element can play two roles. Revelation is to intersperse appearance modeling, enrich the color and add vigor. The second is to protect the product.

For the design of industrial products, metal and plastic are two commonly used materials. However, both of the two materials are subject to certain limitations as shown in Table 4. Applying a layer of painting on the surface of these two materials can play protection effects.

Table 4 Metal and plastic material

Material varieties	Defect
Metallic materials	Metal corrosion and rust
plastic material	Hardness change and crispy

In addition, the application of color elements can enhance the aesthetic feeling of industrial product appearance design, enhance attraction and attract audiences. Different color may evoke different emotional associations of users as shown in Table 5.

Table 5 Color emotional associations

Color	Associations	Emotional associations
white	Snow color and silver	Holy, pure and quiet
Black	Ink and charcoal	Resolute, profound and serious
Gray	Cement and steel rust	Hale, unified and harmonious
Red	Sun, fire and blood	Festival, healthy and warning
Orange	Tangerine, orange and autumn leaves	Warm, delicious and lively
yellow	Gold, sunshine and rice field	Hope, harvest and promising
Green	Grass and tree	Youth, freshness and peace
Blue	Sea and sky	Deep, calm and breadth
Purple	Grapes, materials and equipment	Romantic, elegant and mysterious

In the modern industrial product design, different types of color collocation will produce different effects. On the basis of considering the product features, aesthetic appearance, consumer demand and other factors, innovative color combination can be tried thus to manifest product individuality. Generally speaking, color collocation method of modern industrial product design is as shown in Table 6.

Table 6 Color collocation method

Color collocation method	Effects
Black, white and gray collocation	Harmony and quietness
Contrasting color collocation	Enthusiastic, contrast, lively and eye-catching
Similar color collocation	Harmony, comfortable and warmth
Adjacent color collocation	Elegant, romantic and implicative

3.3 Morphological design

Humanized and personalized design form is crucial for promoting the attraction of modern industrial product appearance design. Designers need to carry out detailed market survey. On the basis of industrial product cultural value and functions, sort the design thinking of production appearance modeling and carry out reasonable form design combining with the aesthetics characteristics. Favorable product form design can transfer product information and sublimate the internal structure and connotation to appearance factors thus to affect the vision and mentality[4]. In most cases, designers shall carry out morphological design through unique modeling language, and convey design ideas and thoughts through unique characteristics.

4 Conclusions

To sum up, the appearance modeling design of modern industrial product is a systematic engineering. It shall consider the unification of individuation and rationalization, and shall ensure the adaptation of appearance modeling and design ideas. Starting from symbol, color and pattern, the paper discussed the characteristics and design methods for appearance modeling of industrial products. During symbol element application process, we should pay attention on the innovation of individuation and symbols collocation combination. During color elements application process, collocation and combination of Xingtai shall be focused. Communication design ideas and concepts shall be conveyed through unique pattern design.

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