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Research on innovative design of lamp mix-and-match based on “sense of dissonance”

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Abstract. With the development of the times, the lamp design bring forth the new through the old every year. "Sense of dissonance" is mentioned in the book of DaiSato, but the reason for its formation is not explored in depth. Based on the induction and analysis of DaiSato's related works, this paper defines the "sense of dissonance", and studies the design trend of the lamps in the Milan design exhibition as the research object, so as to conclude that the main reasons for the "sense of dissonance" come from the mixing of materials, modelling, usage and experience. The design process of light fixture mix and match based on "sense of dissonance" is divided into the following four steps: defining the design content of "sense of dissonance", determining the narrative design theme, determining the style, and completing the modelling. Following this step, a lamp design for 《over the rainbow》 is completed.

1. Introduction

The design of lamps has developed rapidly and is becoming more mature. The function of the lamp is simple, the form of the lamp is increasingly valued, and the lamp design tests the uniform processing of the form and function by the designer. The PH series lamps designed by Danish designer henningsen solve the unification problem of lamps in form and function, which is still regarded as a classic work nowadays. The tray table lamp designed by Japanese designer Naoto opens a new way of thinking in lamp design¹. The design of lamps has become very mature. The design of lamps has begun to pay attention to the interactive relationship between lamps and the environment and people. More and more designs have started to transform from the level of function realization to the level of psychological experience.

Sato, the founder of Japanese design studio Nendo, once put forward that people tend to have a self-evident joy when they feel a little “sense of dissonance”². The great abundance of lamps promotes people's aesthetic pursuit from the general inertial aesthetic development to the aesthetic surprise level. The innovation of lamp design has diversified perspectives, and product design with "sense of dissonance" has become a new direction of design. Therefore, it is of certain significance to study how to create "sense of dissonance" in design. This paper will carry out an innovative research on product design process from the way of creating "sense of dissonance" and taking lamps design as an example.

2. Definition and exploration of “sense of dissonance”

2.1 Definition of “sense of dissonance”



The design of “dissonance” is the result of mashing and merging the same or similar semantics when the original design semantics are unchanged. It will bring new experiences and surprise without affecting the use experience³.

People generally think that the functional semantics of a product is as pure as possible, which is the characteristic of most products. Sato said that some “non-daily” things in daily life are rich and profound. In Sato's design, works with a sense of “dissonance” can be seen. Many of these works are mashed up and designed to mix and match the same or similar shapes or functional semantics. The “disappearance” “brings a different sense of difference and can bring small surprises to the same old boring life



Figure1 Piggy Bank



Figure2 Starbucks Cup

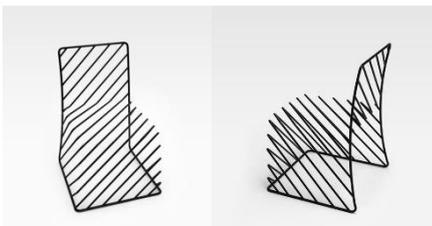


Figure3 “Two-dimensional”chair



Figure4 Chocolate pencil

The “pig nostril” slot design in the piggy bank in Fig. 1 makes use of the similarity in the shape of the slot and the nostril, as well as the contrast in function and semantics, so that people will be surprised by the “sense of dissonance” every time they put money in the slot. When the mug of Fig. 2 is inverted, the coffee pattern at the bottom of the mug can be mistaken as a cup of coffee. The surprise hidden in the bottom of the cup emphasizes the function of the coffee cup and also fully exerts its function. The “unused value” of the product can also reflect the visual beauty when not in use. The chair of Fig. 3 is formed by bending a set of parallel lines, and the planar vision of “two-dimensional” is applied to the three-dimensional shape, so that the generated optical illusion also makes the product more playful than the practical function. The design of Fig. 4 is to apply the method of pencil sharpening to the action of cutting chocolate shavings. By using the ‘mix and match’ in this way, it is possible to give people a more interesting experience that is different from the traditional way.

2.2 “mix-and-match” creates “a sense of “dissonance”

Through the analysis of Nendo studio design works, it is necessary to find the same or similar factors in the same or different things in order to create a product with “sense of dissonance”. Through the organic combination, the product semantics are not affected, the creation of “a sense of dissonance” can be achieved, so that the product has the possibility of creating “surprise”.

The mix design creates new value by connecting two seemingly unrelated things. Mix-and-match is not just the mix of materials or external forms of styling, but also the mix of usage and experience⁴. The conditions for creating “mix and match” are not only common conditions with direct connection, but also non-common factors that seem irrelevant but have indirect relationships. Thus it can be seen that the mix design creates a “sense of dissonance”. The mix-and-match design can be summarized into the following levels:

(1) Mix-and-match in material: It can be a crossover of materials in different fields, or a mix of two or more materials, exploring new possibilities of product forms, creating new product textures;

(2)Mix-and-match in modelling: natural or unnatural shape transplantation to achieve better human-computer interaction or fun experience; (3)Mix-and-match in using process: By changing the original way of using the product and using the new action to complete the product interaction, the purpose of more humanized or deeper experience can be achieved.(4)Mix-and-match in using experience: By changing the process of product experience, multi-level mixed experience is adopted to endow products with new experience, new cultural context and other higher-level design purposes.

3. Research on the mix-and-match design of lamps

At the annual weathervane Milan furniture design show, all sorts of lamps and lanterns design emerge in endlessly in order to achieve a more diverse and innovative ideas, crossover design method is adopted by many designers, In the design of lamps, not only the mixture of materials and shapes is adopted in the form, but also the way of use and the experience of use are mixed in the man-machine interaction relationship of products.

3.1 Mix-and-match in material

The shape and material of the lamp in different environments often directly affect the relationship between the lamp and the environment. The designers use different materials to mix and match or crossover to present the different textures of the lamp. The “Ghost” lamp (Fig. 1) designed by fashion designer Tsumura Yuki applies hair to the design of the lamp through the hair styling technology, which makes the lamp produce a new visual and tactile experience. The design of the “unexpected design” studio of the Chinese independent design brand, The half-mountain lamp (Fig. 2) combines the wood trim and the resin. After cutting into a sheet, each panel forms a different landscape-like picture. This difference also makes each product 'accidental'; Figure 3 is a lamp made by an Israeli designer using sand from the desert; it uses the sand that is considered useless or even harmful. Sand softens the light. In recent years, cement +X materials is also very popular. The cement and glass mixed in Figure 4 is also the same. Cement is a constructional material; its plasticity during forming and the stability after moulding are also favourable factors in product design. In the design of household items, various designs can be made of cement.



Figure 5 “Ghost” light



Figure 6 Half-mountain lamp light



Figure 7 Sand light



Figure 8 Cement light

3.2 Mix-and-match in modelling

The diversified demands of the design have made the diversity of modelling of lamps. Many product shapes that were not originally included in the lamp have also been introduced into the lamp design by the designer ——it does not seem to be a lamp, It doesn't look like a lamp, but it can be illuminated, and the sense of “dissonance” brought by styling and mixing brings surprises. In Figures 9-11, the styling of books, balloons and water droplets is ported to the lamp shape for fun user experience.



Figure 9 Book lamp



Figure 10 Balloon lamp



Figure 11 Water drop lamp

3.3 Mix-and-match of usage and experience

The usage and experience are a process of interaction. Changes in usage may lead to changes in the usage experience, and changes in the usage experience may also lead to changes in usage. This kind of mashup will make the lamp more interactive in use, and it is easier to reach Patrick's highest requirements in the three levels of design, that is 'happy'. A good design makes people smile⁵.

The main function of lamps is to give off light, but if you change the way of turning on the lamp, it is possible to add a more interesting and more user-friendly interactive experience to the lamp design. The tray table lamp (Fig.12) is designed by Naoto Fukasawa. when you return home ,You may put the key into the tray, in the meanwhile, the light is on because of the gravity sensor to turn on the desk lamp. So it gives the user a smoother and more convenient experience. The “Heng” balance lamp of Figure 13 combines the concept of “balance” in Chinese culture to create a new way of opening the lamp. The two balls must be placed together to light up, and the balance of the ball also keeps people calmly and patiently. The "Inflation" lamp Figure 14 shifts the action of the inflation to the switch of the lamp, changing the way the lights are turned on, and increasing the fun of the usage.



Figure 12 Tray table lamp



Figure 13 “Heng” balance lamp



Figure 14 “Inflation” lamp

Lamps can not only provide lighting, but also create a sense of context by the shadow of it, which can arouse association of people. Lamp becomes the partner of the person. It is a lamp, with the minimalist appearance in figure 15. When the light is on, the shape of the light cast by a lamp is like a lampshade.

The collocation of virtual and real forms interesting visual completion, the fish shadow lamp in figure 16 makes the fish swimming in the light and shadow. It brings some Zen. The bulb in the “woops! ” lamp⁷ designed by the YUUE design studio falls down when you pull the switch rope. You perhaps think it is broken, but in fact, it is a great surprise of the experience.



Figure 15 Shadow lamp



Figure 16 Fish shadow lamp



Figure 17 woops! lamp

4. Innovative design process and examples of lamps based on "sense of dissonance"

In the innovative design process of lamps, four feasible design steps are designed from defining the content of "sense of dissonance", determining the narrative design theme, determining the style and completing the shape. The following is the design process of lamps in 《over the rainbow》.

4.1 Looking for "sense of dissonance"

In daily life, the lights generally show a single colour of light, usually white, warm white, and cool white, it doesn't appear rich in colour or abnormal in colour. In physics, white light is a compound light which consists of seven light colours. White light forms a seven-colour spectrum through refracting by triangular prism;

In the design of lamp, the principle of dispersion in physics is used, and seven-colour light is produced by means of prism refraction. The seven-colour light and ordinary lights can produce a sense of dissonance (Fig. 18).

4.2 Design theme determination

After determining the expression form of "sense of dissonance", theme design should be carried out for this form to obtain emotional resonance through narration. Whenever the rain passes and the sky clears up, people always feel surprised and excited when they see a rainbow in the sky. All of them are exclaiming the colourful nature and even the bad mood is swept away (Fig 19). A rainbow always brings warmth and strength. The theme song "Over the Rainbow" of the movie "The Wonderful Wizard of Oz" sings the imagination of the rainbow and gives the rainbow a deeper meaning⁸: "Somewhere above the rainbow, the sky is blue. As long as you dare to dream, it will be achieved".

Combining the artistic conception of rainbow given by this song, the image of rainbow is applied to the lamps that will be used every day, and such love and hope are injected into daily life, hoping that users can sweep away the haze every day and be full of power to move forward.

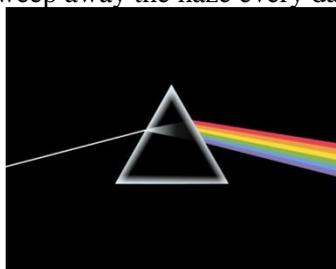


Figure 18 Optical dispersion



Figure 19 Rainbow

4.3 Lamp modelling style determination

According to the current design trend, combined with the warmth of the design theme and text, the design of the lamp should be simple, bright, and fresh and natural. In order to make the rainbow more clearly displayed, the overall shape is divided into two parts: the light box and the light blocking plate. The light blocking plate is the entire blank panel as the projection surface of the rainbow, but the volume and material of the panel need to be repeated in the specific design process. Resolving its coordination, the whole part of the styling is harmonious and unified.

4.4 Design process and results

Firstly, according to the concept of “dissonance” and the design method of “mix and match”, we will find more design points in order to get a better way to achieve the design; then, according to the determined design positioning, the attempt and scrutiny of modeling will require simple geometry. The shape of the graphic, and finally the final shape and structural details are determined according to the shape and function.

The light box of the “Over the Rainbow” lamp is made of solid wood, giving it a fresh, natural and warm texture. The light source and the prism are hidden in the middle groove, and the light on one side of the groove is refracted by the prism to project the rainbow on the circular resin panel. On the other side is the white light used for lighting, which produces the contrast between the original colour light and the rainbow light, creating a “sense of dissonance”, and connecting the “narrative” created and designed in the movie the wizard of Oz, creating an experience scene. The mix-and-match design on the lighting brings an interesting “sense of dissonance” and creates an emotional connection with the designer.



Figure20 《Over the Rainbow》 lamp design

5. Conclusions

From the perspective of “sense of dissonance”, this paper puts forward that the sense of dissonance comes from different mixing ways of product elements, and makes an empirical analysis of lamp cases, combining with the characteristics and design trend of lamps, to complete the design of the example. Design innovative solutions for light fixtures. At the same time, the innovative process design can also provide a reference for other types of products.

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References

- [1] Huang Yanni. Return to the origin of product design -- a brief analysis of the design thought and practice of Naoto Fukasawa [J]. Decoration,2008(11)
- [2] DaiSato, Looking at the world from the inside out [M]. Beijing: Beijing times Chinese book company,2015.3.2016.6
- [3] DaiSato. DaiSato: Solving problems with design [M]. Beijing: Beijing times Chinese book company,2016.6
- [4] He Jinghao. Discussion on the mixed use of materials in today's product design [J]. Art review, 2015(10):105-108.
- [5] Yin Xianghua. Research on interest in interface design [J]. Fine arts, 2018, no.365 (05):104-105.
- [6] The Red Dot award-winning work The Heng Balance Lamp[J]. Modern decoration, 2017(4):191
- [7] PHOTO-YUUE. YUUE: explorer [J]. Design, 2016(10):46-53.
- [8] Wu lan. Music in “the wizard of oz” [J]. Film review, 2015(9):96-98.