

Cultural Innovation and Application of Traditional Patchwork Art in Modern Home Textile

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Abstract. Patchwork is the handicraft art treasure of Chinese traditional textile industry. With the popularization of modern textile industry, patchwork is less and less used, and its derived cultural innovation products are very scarce. This paper analyzes the performance of material design, shape design, color design and theme content design of patchwork art, and applies patchwork art to modern home textiles. By establishing four kinds of geometric shapes for dynamic cloth splicing simulation, it is found that the stitching length of hexagonal pattern is 23.2% less than that of triangular pattern. The hexagonal pattern of cloth cutting and sewing is simpler. After the hexagonal pattern is selected, it is filled with color. By extracting the shape and color model to transform the texture structure, a variety of patterns are selected, and the scheme of the patterns is made into cultural and creative works with local characteristics of Heyuan, Guangdong, such as the cup cover and cup cushion set of Patchwork cartoon dinosaurs. We evaluated the effect of the innovative design of modern home textile works and evaluated the weight of the design scheme, and found that 80.5% of the respondents gave high praise to the home textile patchwork. Practice the innovative application of patchwork in modern home textile products through the above innovative means.

Keywords: splicing simulation; Home textile products; Modeling; Color; Evaluation weight

1 Introduction

As a common expression of home textile products, patchwork art is more and more popular with consumers. This paper studies the material design, modeling design and other aspects of home textile products to achieve the innovative design of patchwork.

2 Overview of patchwork Art

Patchwork is called patchwork clothes, Baijia clothes and paddy clothes. The world clothing dictionary understands it as "a kind of craftsmanship for stitching clothes" [1]. Chinese patchwork first appeared in Zhouli. The "carved pheasant Zhai" is to cut pheasant bird patterns and sew them on the Queen's clothes. It can be seen that patchwork was very popular in the upper class society at that time [2]. In Chinese folk, if a child is born or full moon, the mother of the child will sew the colorful cloth strips presented by friends into clothes or bedding for the child. This is called baijiayi. Children can use all kinds of clothes and clothes. They are not delicate

and can grow up safely. There are many kinds of clothing, not only clothing, but also bibs and vests [3].

Traditional patchwork is due to the lack of living materials, in order to better keep warm and protect the body. The patchwork process is mainly characterized by the stitching and sewing of sheet fabrics of different materials and sizes, and the production of brand-new traditional style baijiayi according to different theme content [4]. Families with children need to ask their relatives and friends for scraps of cloth, and make clothes by splicing the scraps of cloth. Baijiayi is the same production principle, which means that children can grow up healthily. As shown in Fig. 1 and Fig 2.



Fig. 1. Picture of Baijiayi



Fig. 2. Picture of Baijiayi

3 Characteristics of patchwork Art

3.1 Rich in auspicious meaning

The traditional social medical level is low, and the infant discount rate is high. In order to protect the children or for the better growth of the children, parents will ask their neighbors for cloth, and use the cloth to make a dress for the children, which means a long life and healthy growth. On the one hand, the form of baijiayi is the expectation of parents on their children; on the other hand, it also reflects the expectations of Chinese working people for a better life and the feelings of mutual help among neighbors.

3.2 Practicality and decoration coexist

In the traditional society, due to the lack of materials and the severe climate environment, people should resist the cold and sew scattered cloth strips or cloth blocks on clothes, sheets and other daily necessities to keep them warm. With the development of society, people began to pursue the decorative beauty of patchwork. Therefore, various fabrics, colors, patterns, splicing methods and sewing processes were designed and combined to form a unique decorative beauty.

3.3 Various forms of expression

Patchwork has various forms of expression. The fabrics of different colors are spliced in color. The commonly used colors are the same color, contrast color and adjacent color. Each has its own characteristics. The color matching of the same color and adjacent color gives a stable and harmonious visual effect. The matching of the contrast color gives a happy and bright visual

effect. The traditional patchwork on fabrics is cotton and linen, and the modern patchwork combines patterns and colors. The patchwork forms are divided into four types of patchwork: the patchwork of the same and different colors, the patchwork of the same and different colors, the patchwork of the same and different colors, and the patchwork of the different colors [5]. The form should be selected according to the design style, and the color should not be too rich, which will cause the feeling of confusion on the cloth.

3.4 Diversity of manufacturing process

Patchwork was originally made by sewing pieces of cloth together. Later, in the process of Sino foreign clothing cultural exchange, affected by factors such as different regions, cultures, economies and religions, patchwork art formed different styles and schools, and its artistic characteristics became more and more personalized. At the same time, the patchwork process is also rich [6]. In terms of stitching, different stitches have different effects, such as flat stitch, back stitch, roll stitch, etc. in combination with three-dimensional embroidery, such as grain embroidery, chain embroidery, contour embroidery, etc. it shows the decorative beauty of plane and three-dimensional combination.

4 Research on the practice and process of patchwork art in home textile product design

The development of modern patchwork is based on the traditional patchwork production. In terms of material selection, the whole cloth can be cut into various shapes according to the desired effect, and finally spliced into real objects.

The concept of patchwork can be applied to home textile products, such as making cup mats, cup covers, table cloths, bags, bookmarks, decorative paintings, etc. from fabrics with different colors and materials. In the process of design and production, according to the required theme, the fabric of different colors and materials is spliced by using the splicing technique and process skills to match the exquisite patchwork home textile products. Compared with the traditional patchwork art, the modern patchwork art is more practical and covers all aspects of daily necessities. Based on the traditional technology and combined with the aesthetic outlook and needs of modern consumers, the application of patchwork art in modern home textile products is popular.

4.1 Modeling design performance

Patchwork is made by cutting, splicing and sewing of many small patterns. The shape of each pattern determines the sewing amount, overall coordination and manufacturing difficulty of the overall patchwork. As shown in Fig. 3, four geometric shapes of pentagons, triangles.

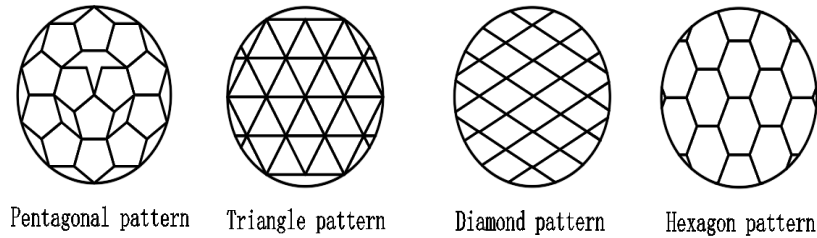


Fig. 3. Pattern type

From the above graphic pattern modeling simulation, it can be seen that hexagon has an advantage in the sewing distance and the number of sewing points. Figure 4 shows that the sewing amount of hexagon is 23.2% less than that of triangular pattern, hexagon pattern is selected for fabric splicing in the next physical production.

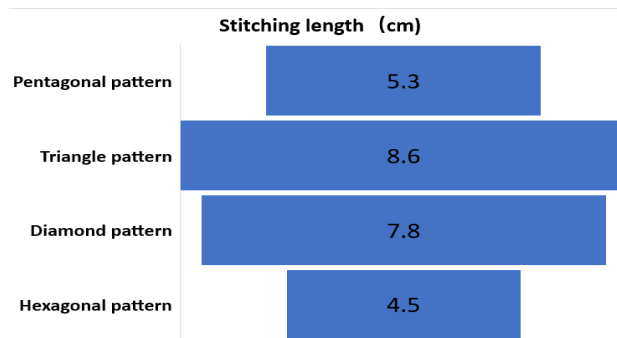


Fig. 4. Stitching length

4.2 Color design performance

This home textile product design practice study uses various patterns and colors of fabrics. In order to highlight the sense of hierarchy, table cloth Figure 5 uses light colors of pink, yellow, blue and purple, which mainly show the sense of hierarchy of patterns and colors.



Fig. 5. Patchwork home textile tablecloth

The patterns are mainly plant patterns, reflecting the rustic atmosphere of returning to nature. The main colors of the coaster, cup cover and paper towel box are dark blue and dark green, combined with light blue broken flowers of different lightness. The shades are appropriate. Through the gray transition, the color sense is displayed. In order to highlight the simplicity of

the home textile products, the material is pure cotton fabric, and the hexagonal stitching is carried out through pure cotton fabrics of different designs and colors. As shown in Fig. 6. The color proportion of the entire tablecloth is shown in the following figure. The cup cushion, cup cover and paper towel box are spliced with pure cotton fabric and broken flower fabric, showing a style of one deep and one light, and the pure color is suitable for the pattern fabric.

Color distribution ratio of patchwork home textile tablecloth

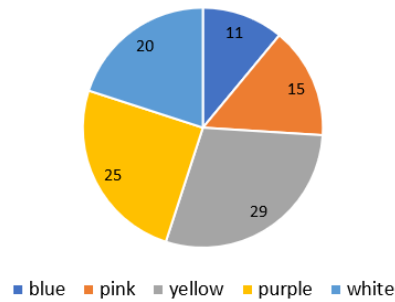


Fig. 6. Color proportion of patchwork home textile tablecloth

4.3 Theme content design performance

In terms of modeling, the Hakka intangible cultural element of Heyuan - Dinosaurs is adopted, breaking the seriousness of traditional dinosaur patterns and expressing through cartoon images. The mouth of the cup cover and the appearance of the coaster all adopt dinosaur head patterns, showing a playful and lovely style. The middle part of the coaster is spliced with dark blue and dark green shapes to make it present a specific shape. The design of the home textile product series takes the Hakka intangible cultural heritage dinosaur element as the theme, and displays the cartoon element image. In particular, the edge of the cup cushion is shaped by the dinosaur head and tail, and the mouth of the cup cover is shaped by the dinosaur head, which reflects the characteristics of the playful and lovely home textile products. As shown in Fig. 7 and Fig 8. Through a group of daily home textile products, such as coasters, cup covers, tissue boxes and tablecloths, the practice and research of material, shape, color and theme content are carried out, as shown in Fig 9.



Fig. 7. Dinosaur tail patchwork cup cover



Fig. 8. Dinosaur head patchwork cup cover



Fig. 9. Overall picture of home textile patchwork products9

5 Evaluation of innovative design effect

According to the innovative design of the above-mentioned group of home textile products, such as coasters, cup covers, paper towel boxes and tablecloths, in order to verify whether they meet the needs and preferences of modern consumers, this paper evaluates this group of home textile works in combination with color, theme and shape. First, according to the characteristics of home textile products in material, color, theme and shape, the evaluation index is set as $e \{EI, E2, E3, E4, \dots, E_n\}$ ($n = 4$). According to the five preference scales, the review set is $\{V1 = \text{very good-looking, } V2 = \text{good-looking, } V3 = \text{general, } V4 = \text{not good-looking, } V5 = \text{very bad-looking}\}$. The evaluation weight of each evaluation index of home textile products is determined according to the scoring method, $w = (0.3, 0.2, 0.3, 0.2)$. See Table 1 for details.

Table 1. Evaluation index description set and evaluation weight of innovative design of home textile products

evaluating indicator	Evaluation index description	Evaluation weight
E1	Novel shape, diverse materials, bright colors and rich patterns	0.3
E2	Simple shape, harmonious color matching, diverse materials and novel patterns	0.2
E3	It has both traditional characteristics and innovation	0.3
E4	Suitable for use in home textile products	0.2

According to the evaluation indicators in Table 1, a questionnaire survey was conducted and distributed to 100 college students. Taking home textile products as an example, the scoring statistical results are shown in Table 2.

Table 2. Evaluation scores of innovative home textile products

evaluating indicator	V1	V2	V3	V4	V5
E1	56	32	8	3	1
E2	42	33	12	10	3

E3	48	29	13	7	4
E4	40	30	15	10	5

The fuzzy judgment matrix D of the design optimization scheme is obtained from table 2.

$$D = \begin{pmatrix} 0.56 & 0.32 & 0.08 & 0.03 & 0.01 \\ 0.42 & 0.33 & 0.12 & 0.10 & 0.03 \\ 0.48 & 0.29 & 0.13 & 0.07 & 0.04 \\ 0.40 & 0.30 & 0.15 & 0.10 & 0.05 \end{pmatrix}$$

The following comprehensive evaluation model B can be obtained:

$$B = W \times D = (0.3 \ 0.2 \ 0.3 \ 0.2) \times \begin{pmatrix} 0.56 & 0.32 & 0.08 & 0.03 & 0.01 \\ 0.42 & 0.33 & 0.12 & 0.10 & 0.03 \\ 0.48 & 0.29 & 0.13 & 0.07 & 0.04 \\ 0.40 & 0.30 & 0.15 & 0.10 & 0.05 \end{pmatrix}$$

$$= (0.476, 0.309, 0.117, 0.07, 0.031)$$

It can be seen from the evaluation results that 47.6% of the people think the tablecloth patchwork is very good, 30.9% think it is good, 11.7% think it is general, 7% think it is bad, and 3.1% think it is very bad. The evaluation of home textile patchwork is shown in table 3.

Table 3. Evaluation of home textile patchwork

Home textile patchwork type	very good	good	generally	bad	Very bad
tablecloth	47.6	30.9	11.7	7	3.1
Dinosaur head cup cover	51.4	29.3	13.8	5.4	1
Dinosaur tail shaped cup cover	49.9	32.5	10.8	4.7	2.1

It can be seen from the chart results that the overall praise rate of college students for home textile patchwork products reached 80.5%, which shows that modern young people are very fond of traditional patchwork applied in modern home textile products. The innovative application of patchwork products conforms to the aesthetic outlook of students.

6 Application thinking of patchwork art and innovative design of home textile products

Through the design practice of home textile products, fabrics of different materials and colors can be spliced and sewn according to a certain shape to form a new style. Applying patchwork art to home textile products has the following advantages.

6.1 The three-dimensional effect of decoration is more obvious

Patchwork art has a more three-dimensional effect than pattern printing and dyeing in terms of vision and tactile sensation through the splicing of different fabrics, colors and shapes. It can also be combined with lace, mercerized velvet and other fabrics to enhance the three-dimensional effect. At the same time, according to the requirements of different themes, simple and gorgeous product texture design can be carried out to meet the needs of different consumers.

6.2 Promote the regeneration of waste

With the rapid development of modern society, the material resources are relatively rich. The waste clothes can be recycled by splicing. The use of patchwork technology can make the old clothes show a new look and give play to their value while protecting the environment.

6.3 Modern derivation of traditional technology

Patchwork technology is the symbol of Chinese traditional culture and is created by the hard-working Chinese people with wisdom. In modern society, in order to better inherit and innovate the traditional patchwork art, we need to carry out modern performance. We can combine modern fabrics, modern aesthetics, modern technology and so on to make the traditional patchwork art look new. In modern home textile products, feel the simplicity and nature of traditional patchwork art.

7 Conclusion

The traditional patchwork art is a folk art with a long history in China. With the development of society, the traditional culture needs to be inherited and innovated to better integrate with the world. Through the practical application of patchwork art in the design of home textile products, the article has carried out application research in the aspects of material, shape, color, theme, etc., especially in the simulation selection of patchwork pattern splicing and the evaluation of the effect of innovative design. Through the comparison of data, the article has better verified the universality of the application of patchwork innovative design in home textile products and the popularity of consumers, better inherit and innovate patchwork art.

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