

A Study on the Visual Translation of Line-Drawing Elements from Dunhuang Flying Apsaras in Down Jacket Quilting Design

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Abstract: Under the influence of the strategy of building a culturally strong country, this study consolidates modern design with Dunhuang culture, focuses on the problems of the simplistic quilting design of down jackets, insufficient targeted research and lack of international competitiveness, and strives to seek solutions from local culture. This paper studies the visual translation path of Dunhuang flying apsaras line drawing elements in the quilting design of down jackets. Taking the quilting design of down jackets as the carrier, this paper analyzes and extracts the line drawing elements of flying apsaras, introduces the compositional principles of modern Chinese painting, and explores the design path of down jacket quilting lines. Attempt to construct a feasible visual translation path between the line drawing elements of flying apsaras and the quilting design of down jackets. The visual translation of the flying apsaras line drawing elements can be achieved through the path of down jacket quilting design dominated by the composition form of modern Chinese painting. However, it is necessary to pay attention to the requirements of the down jacket production process and flexibly solve the practical conflict between design and process. This exploration has certain value for the inheritance and development of Dunhuang flying apsaras art.

Keywords: Flying celestial line drawing element; Visual translation; Quilting thread; Composition form; Translation path

1. Introduction

A down jacket is a kind of clothing with cold-proof function formed by filling down. Nowadays, consumer demand is shifting towards aesthetics. At present, Chinese down jackets do not stand out and lack international competitiveness in terms of clothing innovation and product technology. As one of the main visual elements, the quilting thread of a down jacket, is of self-evident significance in design. The traditional quilting patterns and arrangements of down jackets mostly focus on stability, neglecting the artistic and cultural aspects of the lines and lacking an effective design approach. With the significant increase in the attention paid to down jackets in China's clothing industry, many brands are seeking new paths in the challenges of down jacket design. However, it failed to avoid the problem of product homogenization, which further triggered consumers' aesthetic fatigue. In view of the innovative design dilemma of local down jacket, this paper tries to introduce Dunhuang flying line drawing elements and the formal rules of modern Chinese painting composition, relying on the domestic cultural soil, in order to obtain the emotional recognition of local consumers.

As a classic form of Chinese painting modeling, the application of Dunhuang flying apsaras line drawing elements in down jacket design can break the rigid mindset of traditional quilting design, break through the monotony of down jacket quilting design, and enhance its richness and artistic sense[1]. Flying apsaras show great social vision and symbolic meaning, which can not only show the philosophical spirit of Chinese national culture, but also reflect the image of Chinese art at the beginning[2]. The national Palace Museum staff liu jing once said "the art of flying the feather men visualization, aptly express Chinese culture in the context of special have rich aesthetic characteristics. "From this, it can be seen that he recognizes the aesthetic value of flying apsaras art[2]. The flying and graceful characteristics of Dunhuang flying line drawing elements and its profound cultural deposits can create more quilting patterns and cultural aesthetic values for down jackets. Its flowing and graceful lines are highly dynamic and rhythmic, with a unified form yet rich in variation. When applied in the quilting design of down jackets, it possesses certain cultural attributes and artistic aesthetics. Under the guidance of the formal rules of modern Chinese painting composition, taking down jackets

as the carrier, the elements of flying apsaras line drawing are visually translated and applied to the quilting design of down jackets, creating more vibrant lines, endowing the quilting line with artistic appeal of movement and creativity, and breaking consumers' stereotypical impression of the quilting line form of down jackets.

2. Research Status of quilting thread for down jackets

Down jackets are clothing that combines functionality and aesthetics, and quilting line is key visual and functional element in them. In recent years, research on quilting threads for down jackets can be roughly divided into three categories: The first category is the research on consumers' aesthetic preferences and visual evaluations of quilting line in down jackets. Xu Mengting and others took women aged 18 to 40 in Xi 'an as the survey subjects and designed the questionnaire by applying the basic principles and evaluation methods of sensory engineering. They selected 31 down jackets with different quilting line and 15 pairs of emotional words for research, and conducted mean statistics, factor analysis and cluster analysis on the survey data. The results show that visual factors, style factors, state factors and temperament factors are the main factors influencing perceptual evaluation. Different types of quilting, the density of quilting and the combination methods of down jackets will give consumers different visual and psychological feelings[3]. Liu Yino and others explored consumers' visual perception and preference evaluation of quilted designs for down jackets through eye-tracking experiments. They took young women aged 18 to 25 as the research subjects, and selected three common down jacket silhouettes and 12 quilting styles as the research subjects to analyze the differences in the visual evaluations of the participants. The results show that the effect factor, fashion factor and matching factor are the main factors influencing young female consumers' emotional evaluation of the quilting style of down jackets. They are most concerned about special patterned, rectangular and asymmetrical diagonal quilting designs. The special pattern style that attracts the most attention in visual evaluation is not favored[4]. The second category is the design research of down jacket quilting. Zou Yu analyzed the composition and application form of down jacket quilting, and improved the design of down jacket quilting through different collocation methods of line type and color, material and technology[5]. The third category is the interrelationship between the quilting thread of down jackets and other elements. Ji Zhaojun applied various methods such as field investigation and orthogonal test to study the relationship between the down filling factors of down jackets and the quilting shrinkage rate, and explored the accuracy of the sample size. He conducted a down filling simulation test and made sample clothes using 3D virtual try-on software. The results showed that this method could be applied to the automatic generation of down jacket sample sizes[6]. The above-mentioned research conducts a study on the quilting thread of down jackets from multiple perspectives such as aesthetics, production techniques, and consumer psychology, providing a certain theoretical basis for the subsequent design of quilting thread for down jackets.

3. The visual translation idea of the Dunhuang flying Apsaras line drawing elements in the quilting design of down jackets

3.1 Analysis of Visual translation

Translation is the process of taking one language system as material and clue, and through the sorting and analysis of the translation target, achieving the transformation into another language system[7]. Visual translation refers to the transformation of abstract concepts, cultures or specific substances into another symbolic language, and the creative expression of them through visual elements such as graphics, colors and shapes, so as to achieve the purpose of transformation and application in clothing[8]. The visual translation design of the Dunhuang flying apsaras line drawing elements in the text is guided by the formal rules of modern Chinese painting composition, converting the shape, layout or spiritual characteristics of the flying apsaras into quilting line graphics suitable for down jackets for creative application. This visual translation, after analyzing and transforming the external features and internal spiritual implications of the flying antenna, makes the quilting design of down jackets both creative and cultural. Therefore, in the quilting design of down jackets, it is crucial to convey design elements under the guidance of the formal rules of modern Chinese painting composition, which can evoke cultural and emotional resonance among consumers and achieve a good visual effect and spiritual experience.

3.2 The process of visual translation

The visual translation of the line drawing elements of the flying apsaras in Dunhuang follows the craftsmanship requirements of the quilting design of down jackets, emphasizing the cultural and artistic characteristics of the line. In the process of the analysis and translation of the elements of the flying linedrawing, the premise is to retain the core attributes of the elements, and the formrules of modern Chinese painting composition are introduced into the construction of the quilting form of down jacket, as shown in figure 1.

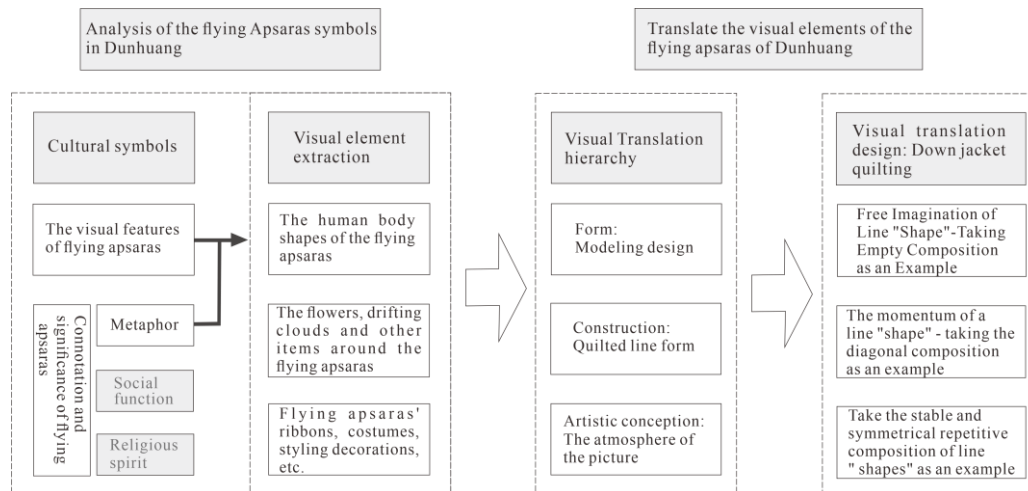


Fig. 1 Visual translation process of the line drawing elements of the flying Apsaras in Dunhuang

3.2.1 Elemental analysis

Through the collection and analysis of the line drawing materials of the flying apsaras in Dunhuang, the line forms that are highly compatible with the quilting line of down jackets are extracted as the objects of translation. These form elements include a variety of streamers and dynamic body modeling, such as the human body and streamers in the same direction and tend to parallel the linemodeling, vertical folding down the streamers or the streamers flying around and so on. Visual translation mainly starts from the form and layout of flying antenna for innovative application.

3.2.2 Translation process

In the process of translation, this article uses two methods for the quilting thread design of down jackets. One is based on the apsaras image as the main body, and the other is based on theauxiliary objects of the apsaras image as the main body for quilting design. This study guides the quilting line design of down jackets by applying the formal rules of modern Chinese painting composition, such as symmetrical composition and the creation of pictorial "posture" , and conducts design through composition forms including sparse composition, repetition and symmetry[9]. Based on the visual features of the flying apsaras image, available line units are extracted, and the external form of the flying apsaras is transformed through methods such as linear reconstruction, truncation and deformation, and arrangement and recombination. The key to translation lies in grasping the core characteristics of the flying line -the sense of flying and the implied spirit. And match the colors of the flying apsaras with the popular colors, select the colors suitable for down jackets to express, so as to meet the aesthetic needs of contemporary consumers.

3.2.3 Modern Chinese painting composition guides the construction of the quilting line form of down jackets

Firstly, to transform the visual form of the flying apsaras in Dunhuang into line units, it is necessary to follow the basic principles of down jacket quilting design. Overly complex lines can easily lead to processing issues. Both too large and too small gaps in the lines can cause an imbalance in the internal down. Secondly, the differences in the shape, direction and arrangement of the quilting thread in down jackets convey completely different meanings of the clothing and the psychological feelings of consumers. Finally, when guiding the construction of the quilting line form of a down jacket with the composition of modern Chinese painting, the down jacket can be regarded as an integrated picture and presented in a linear drawing. This is a direct result of visual transformation. It not only highlights the characteristics of the flying apsaras line drawing elements but also gains consumers' recognition in

terms of culture and emotion through the innovative application of composition methods.

4. The visual Transformation of Dunhuang Flying Apsaras line drawing elements in the quilting design of down jackets

The flying apsaras, with their own dynamic features and dynamic line drawing shapes, provide inspiration and materials for the quilting design of down jackets. The design path of down jacket quilting is improved through the formal rules of modern Chinese painting composition, and quilting design is carried out from the perspective of composition form to develop more quilting forms.

4.1 The flying characteristics and line drawing techniques of flying apsaras

The core feature of the flying apsaras in Dunhuang is their movement, which is mainly presented through line drawing techniques and modeling. Mr. Tan Shutong believes that the momentum, rhythm and charm of the "flying" beauty of the flying apsaras are not only reflected in the fluidity of the lines, but also in the overall style of the shape, coloring and brushwork[1]. From the perspective of shape analysis, the design of the flying apsaras has undergone a transformation from "V, U, S" shapes through its early development, prosperity, and decline. During the highly dynamic Tang Dynasty, it presented an "S" form, creating a visually elegant and carefree atmosphere[10]. From the perspective of line drawing techniques, as a specific painting language in Chinese painting, lines possess unique symbolic meanings and independent aesthetic values[11]. By integrating the dryness and wetness of the brushes and ink used with the painter's hand movements such as lifting, pressing and turning, the intricate and endless forms of the lines are created. The technique of flying apsaras line drawing has also been constantly changing and developing under the influence of Chinese painting art. From the line drawings of flying apsaras from different periods in the Dunhuang murals, it can be seen that the lines of flying apsaras before the Tang Dynasty had a weak sense of rhythm and lacked the vitality and charm. It was not until the Sui Dynasty that they highlighted the sense of rhythm and the elegant charm with their slender postures and the graceful and unfurled ribbons. From the perspective of line expression techniques, in the early stage, it was mainly influenced by the iron line drawing of the Jin Dynasty painter Gu Kaizhi. During the prosperous period, under the influence of Wu Daozi's painting style, it emphasized rhythm and cadence, and the brushstrokes were light and heavy, fast and slow, sparse and dense, expressing the image of flying apsaras with endless line forms[12]. The flying apsaras, with highly summarized dynamic lines, the contrast between the real and the illusory, and the technique of leaving blank Spaces, create an elegant image of the flying apsaras, evoke a distant artistic conception, and showcase the power of soaring upward.

4.2 The Flying Apsaras and the formal Rules of Modern Chinese Painting Composition

The flying apsaras are a classic form of the line drawing modeling method in Chinese painting. In the process of inheriting and innovating the forms of Chinese painting, artists have created brand-new images of flying apsaras[1]. The composition forms of Chinese painting have been applied in the creation of flying apsaras murals, such as symmetry and repetition. The prominent features of the composition of flying apsaras are orderliness and freedom, mainly including continuous composition, symmetrical composition and scattered composition. The composition of traditional Chinese painting emphasizes "arrangement and layout", "positioning", "composition", etc. However, the techniques and rules of modern Chinese painting show a diversified trend and integrate the constituent elements and drawing techniques of modern Western painting, making its presentation forms more rich and diverse, and also conveying the new aesthetic pursuits of contemporary people[12]. Many renowned painters in modern times have paid attention to the Dunhuang murals. For instance, Mr. Zhang Daqian and Mr. Chang Shuhong not only produced numerous academic copies but also created creative works that highlighted their personal characteristics, promoting the exchange between Dunhuang art and the world. Compared with the traditional composition forms used in flying apsaras murals, the composition of modern Chinese painting incorporates the aesthetic standards and diverse demands of The Times, representing a dynamic inheritance and development of the composition forms in Chinese painting. Based on the traditional composition of painting, it pays attention to the creation of the "momentum" of the picture, and uses various forms of the picture such as empty composition, full composition, diagonal, and S-shaped to practice the concept that "the impossible is the way", conveying the infiniteness of today's painting forms. The combination of flying apsaras elements and modern Chinese painting composition forms in the quilting design of down jackets represents the integration of painting

art and clothing products, highlighting the boundless vitality of traditional culture in the new era.

4.3 The Visual Translation and Design of Flying Line Drawing Elements in down Jacket Quilting

One of the most important visual elements of a down jacket is the quilting thread, the changes in its shape, the variations in combination forms, the changes in parts, the increase or decrease in quantity, etc, will all affect the visual effect of down jackets. Quilting line, as an indispensable part of the formal beauty of down jackets, can be roughly divided into vertical line composition, horizontal line composition, diagonal line composition, curve composition and broken line composition[5]. Each type of line has its own shape and formal characteristics, and the visual perception it generates is also different. In the design of down jackets, the sole use of symmetrical, repetitive and other quilting thread composition methods results in regular quilting thread units. If the composition method is changed and multiple combinations of quilting lines are carried out, quilting line pictures with distinct styles can be produced. From the perspective of composition, changing the traditional quilting line design form of down jackets and introducing the formal rules of modern Chinese painting composition can seek more diversified quilting line design paths.

This paper extracts the applicable line elements from the flying apsaras design, mainly from two aspects: human body form and ribbon design. Figure 2 shows the visual translation process of the flying apsaras line drawing elements: Five flying apsaras images from the prosperous Tang Dynasty were selected as the translation objects. After a preliminary morphological analysis, five lines shapes were extracted, and then new line units were translated through methods such as simplification, replication, mirroring, and looping. The quilting units produced by different translation and combination methods are also different. On the basis of following the principle of adaptability, they are applied to the design of down jackets.

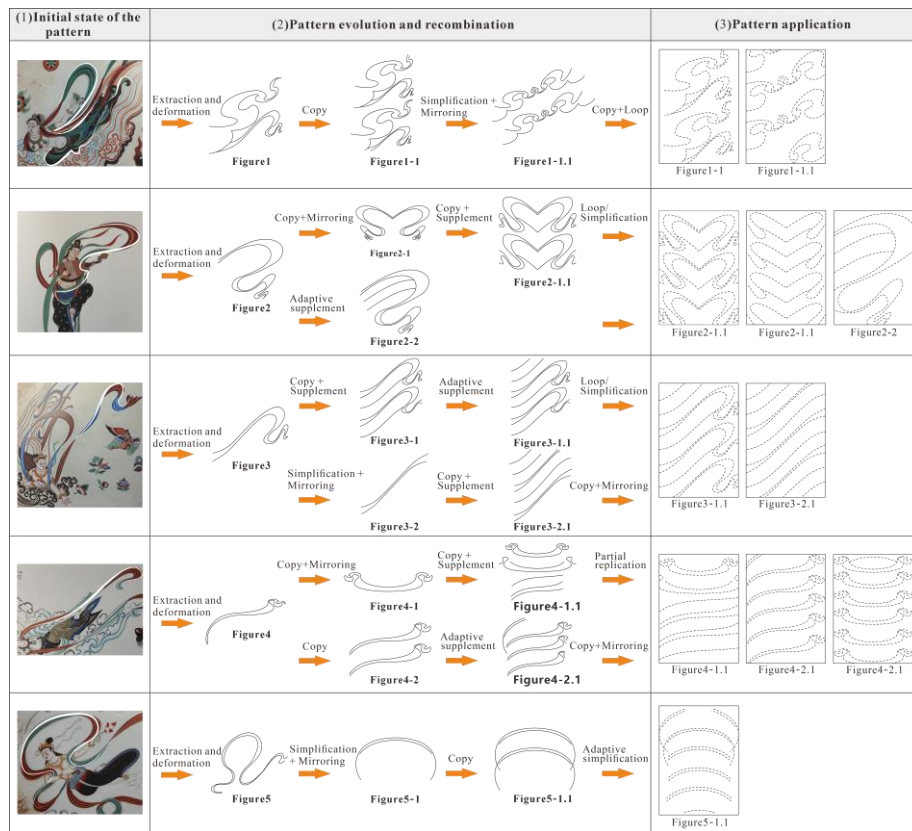


Fig. 2 Transformation and Deduction of the line drawing elements of the Flying Apsaras in Dunhuang (The flying apsaras images are from "Restoration of Dunhuang Murals")

5. The design path of down jacket quilting lines dominated by the composition form of modern Chinese painting

On the one hand, the design of quilting in down jacket needs to pay attention to the visual beauty,

on the other hand, it needs to pay attention to the relationship between quilting and the amount of fluff and warmth. When the down filling amount is relatively small, the warmth retention effect shows a positive correlation with the quilting line spacing. Under the form of parallel and uniform quilting lines, the warmth retention effect is relatively better. When the filling amount is large, the influence of quilting line spacing on thermal insulation is relatively small and can be ignored[6]. In addition, the complexity of the line shape and the spacing between the lines need to be given special attention, overly complex lines or overly large or small gaps can both lead to an imbalance in the internal fleece volume. The research focus of this study is on the visual part of quilting thread, Taking the basic down jacket as an example, under the guidance of the composition form rules of modern Chinese painting, three forms - empty composition, diagonal composition, and symmetrical and repetitive composition - were adopted for practical verification.

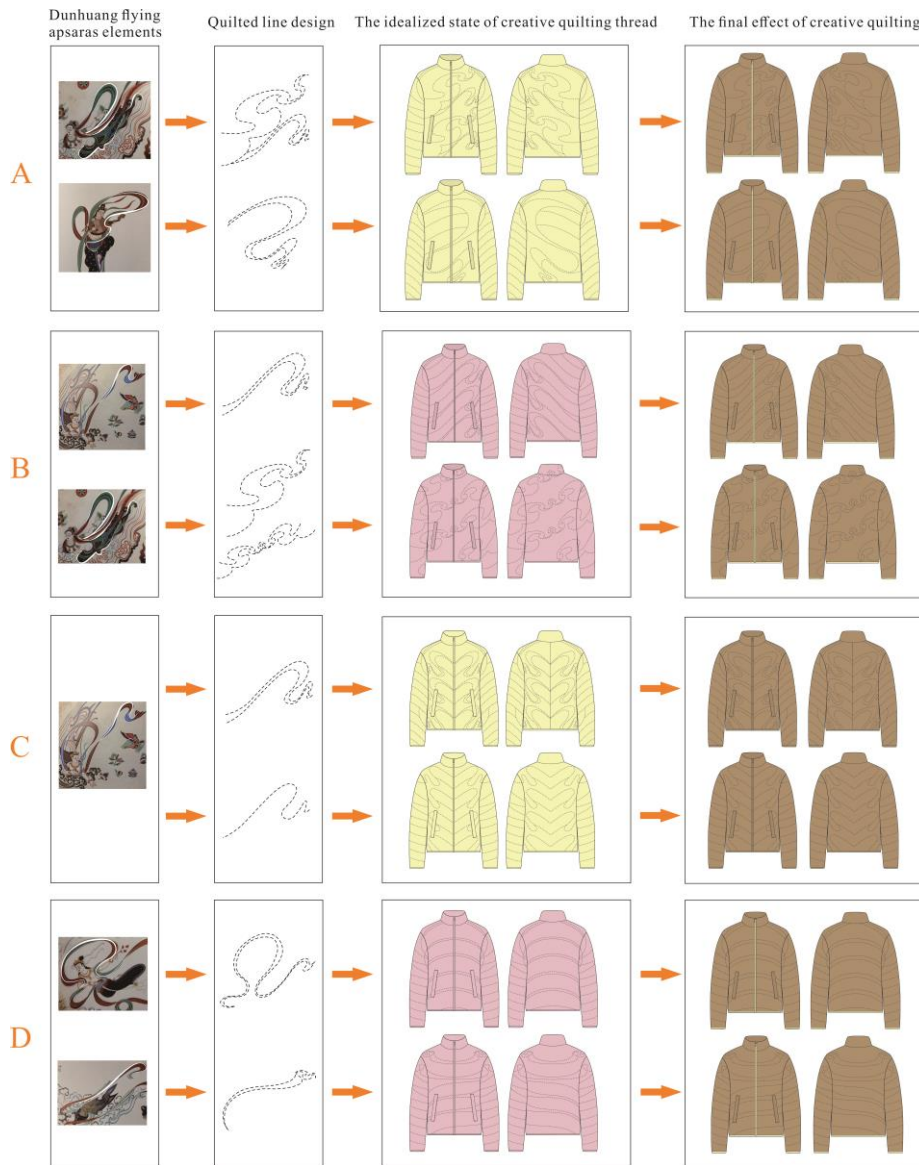


Fig. 3 The author designs and draws the style diagram

5.1 Free Imagination of Line "Shape" - Taking Empty Composition as an Example

The so-called empty composition presents a sense of spaciousness in the picture. Adhering to the visual concept of simplification, the picture contains only one or two main objects, such as a ribbon, a graceful and fluttering person, or two flowing clouds. The picture is clean and distant, giving the viewer more space for imagination and allowing the soul to freely wander[9]. The design work in figure 3A is based on the body outline and ribbon shape of the flying apsaras. Through the perception of the spirit and charm of the main object, it transforms into a dynamic line shape. It is applied in the

design of down jackets in the form of a single or two shape units, creating a sense of emptiness and distance in the picture and conveying the dynamic feeling of the clothing. For the design of down jacket quilting lines dominated by empty composition, it is necessary to carefully consider the gaps of local lines. If the space is too large, the quilting lines should be appropriately increased to prevent the down from sinking. At the same time, on the basis of the idealized quilting line form, the spacing and details should be adjusted to avoid situations where production is impossible, and to enhance the rationality of the down jacket quilting lines during the production stage.

5.2 The Momentum of a line "shape" - Taking Diagonal Composition as an Example

Diagonal composition focuses on maintaining the diagonal balance of the picture, forming the dynamic momentum of the picture, and can play a good role in creating the potential energy on the surface of the down jacket. The design work in figure 3B presents the rhythm of lines and the upward trend on the surface of the down jacket. By cutting and using the shape of the ribbon or replicating or mirroring the line units of the human body contour, a recyclable quilting line design can be generated, and the quilting line spacing and details can be adjusted to meet the requirements of garment production. There are two structures of quilting line design dominated by diagonal composition: one is the diagonal circular structure, and the other is the diagonal non-circular structure. Both methods have their advantages. For instance, the non-circulating structure offers more freedom in wire usage than the circulating one. However, in the process of mass production, the circulating structure is more convenient, while the non-circulating structure takes more time and incurs higher costs. An effective choice should be made based on design requirements.

5.3 The stability of Line "shape"-Taking Symmetrical and Repetitive Composition as an Example

Symmetrical and repetitive composition forms emphasize balance and can give people a stable visual impression, which is a classic rule in the composition forms of Chinese painting. These two forms were adopted for practice in the design works shown in figure 3C and 3D. By using symmetrical composition alone or applying symmetrical and repetitive composition in the same picture, and taking the different shapes of the ribbons as the basic graphics for translation, the flowing genes are infused into the down jacket. The completely symmetrical composition rule shapes a standardized aesthetic of clothing, forming an overall stability and facilitating production. The combination of symmetry and repetition adds some variations to the norms, which can to a certain extent avoid the dull quilting line pictures. The quantity and form of quilting threads in a down jacket are the two most important factors in the design, directly influencing the overall style of the down jacket. The common symmetrical parallel quilting pattern, with a large number of lines, is delicate; with a small number, it is rough. However, in specific practice, this universal rule needs to be analyzed specifically based on different quilting line images. Overall, conflicts may arise between theory and practice during the design process. For instance, the lines of the flying apsaras ribbon are dynamic, and the gaps in some parts are very small. When applied to the quilting design of down jackets, adjustments are needed, there may be inconsistencies between the degree of gracefulness of the lines, the gaps and the requirements in the manufacturing process. This requires adjustments based on specific circumstances rather than blindly conforming to theories.

6. Conclusion

As an important visual element in design, the quilting thread of down jackets cannot be ignored. Under the guidance of the formal aesthetic principles of Chinese painting composition, this article visually translates the line drawing elements of flying apsaras and applies them to the quilting design of down jackets, enhancing the creativity and visual aesthetics of down jacket design. The above practices demonstrate that, on the visual level, The formal beauty principles of composition in Chinese painting can guide the quilting design of down jackets and provide theoretical support for it. However, in practical applications, special attention needs to be paid to the requirements of the manufacturing process, as the visual forms may conflict with the process requirements. The spacing of quilting lines, aesthetics, sewing techniques costs and many other factors all need to be carefully considered and continuously optimized during the design of down jackets. In the design process, sometimes theory and practice are not completely consistent. Designers need to solve the contradiction between theory and practice flexibly on the basis of grasping the whole, so that theory becomes the forerunner of practice, rather than the controller.

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