



Evolution and Creative Design of Circular Dragon Patterns in Ming Dynasty Emperor's Dragon Robe

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Abstract: This study explores innovative application methods of traditional circular dragon patterns in modern clothing design by analyzing the characteristics and evolution of circular dragon patterns in the Ming Dynasty Emperor's dragon robe in depth. The observational method was used to record and analyze the details of the circular dragon patterns on the Ming Dynasty dragon robe, summarizing the stylistic changes and evolution over different periods. Based on this, innovative design experiments were conducted, integrating modern design elements and various techniques to create designs that preserve traditional cultural connotations while meeting modern aesthetic standards. By simplifying, reorganizing, and transforming traditional circular dragon patterns, the study proposes multiple innovative design methods and demonstrates their specific applications in modern clothing. The results indicate that the combination of traditional circular dragon patterns with modern design elements and techniques not only preserves and promotes traditional culture but also infuses new vitality and creativity into modern clothing design. This study provides valuable references for the application of traditional patterns in modern clothing design, contributing to the transmission and innovation of Chinese traditional culture.

Keywords: Circular dragon patterns, stylistic changes, innovative design, application.

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1. Introduction

As an important carrier of Chinese traditional culture, Hanfu has attracted widespread attention and love in China and overseas in recent years [1]. Among the most representative patterns in Hanfu is the circular dragon pattern on the Ming Dynasty emperor's dragon robe, which not only has profound cultural connotations and symbolic significance but also showcases the superb craftsmanship and artistry of ancient craftsmen [2]. However, with the development of the times, how to integrate this traditional cultural essence into modern design while preserving it has become an important issue for designers.

Researching and innovating these traditional patterns is of great significance for inheriting Chinese culture and enhancing cultural identity [3]. This study conducts an in-depth analysis of the characteristics and evolution of the circular dragon pattern on the Ming Dynasty emperor's dragon robe and explores innovative application methods of traditional circular dragon patterns in modern clothing design. By employing modern design techniques and diversified changes, this study gives traditional patterns new visual effects and a sense of fashion. This integration not only enriches the language of modern fashion design but also enhances the adaptability and appeal of traditional elements in contemporary design, thereby increasing the visual impact and market acceptance of the patterns [4].

By retaining the core elements of traditional circular dragon patterns, modern design can inherit and promote traditional culture, which is significant for protecting and promoting cultural heritage. Innovative designs enable traditional cultural elements to be accepted and appreciated in a broader market, thus promoting the development of the cultural industry [5]. This study demonstrates methods of combining

traditional elements with modern design, providing new ideas for future design and inspiring more innovative creativity.

2. Literature Review

2.1 Historical Background of Ming Dynasty Dragon Robe

As the ceremonial dress of the emperor, the Ming Dynasty dragon robe is an important component of ancient Chinese clothing culture. Made of silk, the dragon robe predominantly features yellow, which symbolizes authority and nobility in traditional Chinese culture [6]. The dragon robe is richly adorned with a variety of motifs, including the five-clawed circular dragon and the twelve symbols, either woven or embroidered onto the garment, showcasing the high level of craftsmanship of Ming Dynasty artisans. The design of the dragon robe not only signifies the emperor's supreme status but also reflects the values and cosmology of Ming society [4].

2.2 Origin and Evolution of Circular Dragon Patterns

As a significant element of traditional Chinese motifs, the origin of circular dragon patterns can be traced back to the Tang Dynasty and continuously evolved through the Song, Yuan, and Ming Dynasties. During the Tang Dynasty, circular dragon patterns first appeared, characterized by relatively simple dragon images outlined with bold lines to convey majesty and power [7]. In the Song and Yuan periods, the design of circular dragon patterns became more complex with richer details, diverse dragon postures, and the addition of more decorative elements like cloud and water motifs, making the overall design more exquisite [8].

2.3 Application of Dragon Patterns in Modern Design

As an important element of traditional Chinese culture, dragon patterns have begun to be applied in modern design in recent years. The design elements of dragon patterns from the Ming Dynasty in China have been used to create horse-face skirts with a strong cultural identity. In the design of competitive sportswear, designers have incorporated traditional pattern elements such as dragon patterns to enhance the details and cultural connotation of the clothing [9]. In modern dress design, designers use digital printing technology to give dragon patterns a modern sense [10]. Through these innovative methods, dragon patterns have been applied in modern design, not only promoting the inheritance of traditional culture but also injecting new vitality into modern design.

There are still some gaps and limitations in the existing literature. Most studies focus on the descriptive and historical aspects of circular dragon patterns without systematically exploring their evolution and innovative design. There is limited research on the innovative application of these traditional patterns in modern clothing design. These gaps highlight the need for a comprehensive study that not only analyzes the stylistic changes of circular dragon patterns but also experiments with their application in contemporary fashion.

3. Methodology

3.1 Characteristics and Evolution of the Seated Circular Dragon Pattern

The seated circular dragon pattern features the dragon head facing the observer, with the dragon's body intertwining with clouds, forming an "S" shaped coiled posture. The dragon's tail is cleverly balanced, presenting a symmetrical and harmonious stance with the dragon's head [11]. The dragon's head is detailed, robust, and powerful, with eyes as bright as copper bells. The dragon claws are spread out, resembling crab pincers, showcasing their ferocity. The scales are delicately designed, appearing grid-like or similar to fish scales, enhancing the texture and three-dimensionality of the pattern. The surrounding cloud and sea wave patterns blend with the dragon's body to form a circular design, usually centering around a pearl, symbolizing supreme authority and wealth.

The style of the seated circular dragon pattern evolved throughout the Ming Dynasty. In the early Ming Dynasty, the dragon's body was shorter, and the claws resembled crab pincers, showing a more straightforward overall design and early exploration of dragon imagery. By the mid-Ming Dynasty, the

dragon's body length and claw shapes began to standardize, and the cloud and sea wave patterns became more intricate, indicating improved craftsmanship and matured aesthetics. In the late Ming Dynasty, the composition of the seated circular dragon pattern became more standardized, with more fluid and graceful dragon forms and finer cloud patterns, showcasing the cultural prosperity and artistic refinement of the late Ming era. Overall, the evolution of the seated circular dragon pattern from simplicity to complexity and then to standardization and refinement reflects the development of Ming Dynasty's clothing art in response to societal progression and technological advancements.

3.2 Ascending Circular Dragon Pattern: Characteristics and Evolution

The ascending circular dragon pattern, with its head curved upwards, symbolizes the dragon's ascent and the emperor's majestic presence, embodying a sense of support and reverence. Depending on the direction of the dragon's head, it is categorized into "leftward ascending dragon" and "rightward ascending dragon," showcasing the pattern's diversity. The dragon's head is round and pronounced, displaying a range of expressions. A closed mouth conveys solemnity, while an open mouth revealing fangs and tongue exudes vigor and dynamism. The gaze is sharp, looking upward and to the side, adding to the dragon's vivacity. The mane and beard closely interlock and surge upwards, with the beard floating up like the mane, its tips curving outward, enhancing the sense of motion and strength. The dragon's body curves, forming a "C" or "S" shape, with the tail dancing below and the abdomen arched, projecting immense power. This composition gives the dragon an overall impression of soaring and leaping [12]. Surrounded by auspicious cloud patterns and sea waves, forming a circular design with a pearl at the center, adorned with sea waves and auspicious clouds around, symbolizing supreme power and wealth.

Throughout the Ming dynasty, the ascending circular dragon pattern exhibited stylistic changes and craftsmanship improvements, reflecting aesthetic shifts and cultural developments of the era. Early Ming patterns retained some Song-Yuan dynasty styles, with coarser lines and simpler dragon designs, indicating initial explorations into dragon imagery. By the mid-Ming period, as craftsmanship advanced, the patterns' lines became smoother, the dragon's curvature and ascending posture more pronounced, and the overall composition more refined. In the late Ming, designs became more ornate and intricate, with softer and more delicate lines for the dragon's body and head, larger and more expressive eyes, showcasing the cultural prosperity and artistic sophistication of late Ming. During this period, decorative elements like clouds and flames became richer and more exquisite, making the overall pattern more three-dimensional, emphasizing the dragon's majesty and mystique.

3.3 Descending Circular Dragon Pattern: Characteristics and Evolution

The descending circular dragon pattern, with its head pointing downward, symbolizes the emperor's benevolence and protection. The dragon's posture varies, including leftward and rightward descending dragons, displaying dynamic beauty and richness in layering. The dragon's head is round and prominent, with an open mouth showing fangs and tongue, portraying a lively and formidable expression. The dragon's whiskers float downwards or upwards, adding a sense of fluidity and agility. The eyelashes are rugged, and the eyes are large and bright, focusing intently on the pearl below, demonstrating determination and focus. The dragon's claws are spread, each toe resembling a crab's pincer, indicating fierceness and the ability to grasp firmly. The dragon's body coils, intertwining with cloud and sea wave patterns, forming a complex circular design, with surrounding elements enhancing the pattern's mystery and solemnity [6].

From the early to late Ming dynasty, the descending circular dragon pattern underwent significant transformations. Initially characterized by simpler lines and a more unified design, the early patterns showed a rougher dragon form and scale design. As the dynasty progressed, the lines of the descending circular dragon pattern became smoother, the body's twisting degree increased, and the claws and scales' designs became more detailed and varied. In the late Ming, the pattern became more complex and delicate, with more pronounced details on the dragon's head, eyes, and mouth, exaggerated claws and mane, and richer scale designs. This evolution not only reflects the advancement in the art of Ming dynasty clothing but also mirrors the changing cultural atmosphere and aesthetic trends over time, as shown in Table 1.

Table 1: Seated Circular Dragon Pattern (Drawn by the author)

Period	Apparel Image	Seated Circular Dragon	Ascending Circular Dragon	Descending Circular Dragon
Ming Early Period				
Ming Middle Period				
Ming Late Period				

4. Discussion

4.1 Symmetrical Circular Dragon Design Experiments and Applications

4.1.1 Design Method Steps

The standard circular dragon pattern features the dragon's head facing the viewer, with the dragon's head adopting a symmetrical form and its body encircling to form a circular pattern [13]. In this experiment, this symmetrical structure is retained in the innovative design, but the details are simplified and reorganized. The steps are as follows: First, determine the design shape, including the circular dragon and the circular structure; second, design the dragon head, placing it at the center of the image; third, design the dragon body, adding the basic form of the dragon body along the outline of the image, ensuring the body encircles to form the initial design shape; fourth, add scales and decorations, placing tightly arranged, layered scales on the dragon body; the scales should coordinate with the curves of the dragon body, and modern decorative elements should be added around the dragon body and head. As shown in Figure 1.



Figure 1. Steps of the Standard Circular Dragon Design Experiment

4.1.2 Design Applications

By following the above steps and methods, various styles and themes of symmetrical circular dragon pattern designs can be achieved, as shown in Table 2. These designs meet modern design requirements while preserving traditional elements. The sample patterns in the table illustrate a modern interpretation of traditional circular dragons combined with floral elements. In each pattern, the foundation of traditional dragon patterns is maintained while incorporating innovative concepts of modern art design and floral

decorations. Samples 1 and 2 use geometric methods to express the dragon's structure, presenting a simple and bright modern style; Sample 3, in addition to geometric expression, also adopts intricate textures, making the pattern richer and more three-dimensional; Sample 4 showcases the beauty of tradition and modernity through floral decorative elements and detailed intricacies. Through this method, not only can dragon patterns that conform to modern aesthetics be designed, but traditional culture can also be inherited and innovated.

Table 2: Innovative Symmetrical Circular Dragon Designs

			
Sample1	Sample2	Sample3	Sample4

4.2 Balanced Circular Dragon Design Experiments and Applications

4.2.1 Design Steps and Methods

Balanced design is mainly achieved through ascending and descending dragon patterns [14]. The structure of the dragon primarily includes the dragon's head, body, scales, tail, and mane, with other parts simplified or omitted. Different framework forms (such as S-shape, O-shape, C-shape, 8-shape, 9-shape, spiral shape) are used to express the diversity and dynamism of the dragon pattern. The specific design ideas are as follows:

Step 1: Determine the Design Shape

Form various balanced frameworks through the dragon's body, commonly including encircling O-shape structures, open arc shapes (similar to the letter C), continuous curves (similar to the letter S), interconnected 8-shapes, 9-shapes, and spiral shapes. Use simple lines to sketch the basic form.

Step 2: Design the Dragon Head

The dragon head design in O-shape structures can be located on the left or right side and presented in the center of the O-shape structure in a side view; C-shape, S-shape, etc., generally position the dragon head at the top or bottom of the shape. The right S, C-shape dragon heads face right, and the left S, C-shape dragon heads face left, all presented in a side view, depicting detailed whiskers, horns, and eye details to make the dragon head full of power and dynamism.

Step 3: Design the Dragon Body and Scales

Ensure the curves of the dragon body are natural and smooth. For example, for C-shape dragons, form left or right open arcs like left C or right C; for S-shape dragons, continuous curves can also form left S or right S. The scales should be arranged tightly with clear layers. Combine modern design elements such as geometric patterns or abstract motifs to enhance visual impact.

Step 4: Design the Dragon Tail

Position the dragon tail opposite the dragon head. Maintain a smooth curve throughout the design, keeping it simple and powerful. The tail can slightly rise or droop to increase dynamism and layering.

Step 5: Add the Dragon Mane

The dragon mane departs from the traditional dragon form and is usually combined with modern patterns. It can be added to one side, both sides, or the entire body of the dragon.

Step 6: Overall Coordination and Adjustment

Ensure all parts are coordinated and consistent, making the overall design aesthetically pleasing and balanced. Make detail adjustments as needed to ensure each element enhances the overall design effect.

Based on the above steps, the following example demonstrates the drawing steps of a right C-shaped circular dragon in Figure 2.



Figure 2. Right C-Shaped Circular Dragon Drawing Steps

4.2.2 Design Applications

In Figure 3, the O-shaped circular dragon's head is positioned on the right side of the O-shape structure, with the dragon's mane combined with feathers wrapping around both sides of the body, creating rich textures and dynamic effects. This design is applied to a dress, with the print extending from the front chest to the right skirt hem, showcasing the dragon's majesty while incorporating a modern, stylish dynamism. In Figure 4, the O-shaped circular dragon's head is positioned on the left side of the O-shape structure, with a dragon claw on the left side echoing the dragon's head, enhancing the visual balance of the design. The dragon's mane combined with floral elements on the dragon's body is applied to the sleeves of the top and the left side of the pants in a suit, with the print extending from the sleeves to the upper part of the left pants leg, creating a continuous visual effect that enhances the coherence and coordination of the overall design.

In Figure 5, the right C-shaped circular dragon's body is interrupted and connected by cloud patterns. The combination of printing and hot drilling is applied to the front chest, skirt body, and hem of the dress, adding a three-dimensional effect and luxury. In practical applications, this design is suitable for high-end evening dresses or decorative daily clothing. In Figure 6, the left C-shaped circular dragon's design restores the dragon's structure more completely, with the dragon's form partially overlapping with the circular shape. The original pattern is adjusted according to the dress style and applied to the side of the skirt using printing techniques.



Figure 3. Right O-shape



Figure 4. Left O-shape

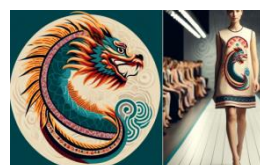


Figure 5. Right C-shape



Figure 6. Left C-shape

In Figure 7, the right S-shaped circular dragon design simplifies most of the dragon's structure, using geometric shapes to form an "S." The partially transformed design is applied to the front chest of the evening dress with sequin embroidery, while the lower hem features floral embroidery, creating a harmonious effect with the S-shaped circular dragon pattern on the upper body, enhancing the overall design's coherence. In Figure 8, the left S-shaped circular dragon design combines the dragon body with realistic floral designs, creating a unique "S" shape pattern. The pattern is identically applied to the front chest of a T-shirt using hot drilling techniques. In practical applications, this design is suitable for daily casual wear, perfectly blending traditional elements with modern fashion, possessing cultural connotations while maintaining trendiness.



Figure 7. Right S-shape



Figure 8. Left S-shape

In Figure 9, the 8-shaped circular dragon's scales are simplified into straight lines, with the dragon's head and body coiling to form an 8-shape. The circular structure is suitable for filling with floral elements elsewhere. On the front of the evening dress, the pattern is redesigned according to the style, using gold couching embroidery to enhance the overall design's layering and artistic value.



Figure 9. 8-shape

In Figure 10, the 9-shaped circular dragon's body structure is weakened, with floral elements replacing parts of the dragon body. According to the clothing style, the print extends from the shoulder to the front, retaining the original traditional elements while adding creative extensions. The shoulder pattern design enhances the overall coherence and coordination, making the garment more visually impactful.



Figure 10 .9-shaped

In Figure 11, the spiral-shaped circular dragon's body adopts irregular coiling. When applied to a down jacket, the original pattern is retained while adding a background according to the clothing style. The print on the front chest is echoed by floral patterns on both sleeves. In Figure 12, the spiral-shaped circular dragon's body is more concentrated, piled up in a circular pattern, with flowers represented in a realistic form. The pattern retains the original print on the back of the jacket, while creatively applying it to the hat, sleeve roots, and cuffs according to the pattern. This design achieves a balanced visual effect.



Figure 11. Left Spiral-shaped



Figure12. Right Spiral-shaped.

5. Conclusions

Through in-depth analysis of the stylistic characteristics and evolution of circular dragon patterns in the Ming Dynasty emperor's dragon robe, this study proposed various innovative design methods and successfully applied them to modern clothing design [15]. The results show that the combination of traditional circular dragon patterns and modern design elements can not only inherit and promote traditional culture but also endow clothing with new fashion vitality. The main conclusions of this study are as follows:

5.1 Diversified Innovations in Dragon Pattern Designs

This study explored various forms of traditional circular dragon patterns and developed innovative designs based on these forms [16]. By simplifying the dragon's structure and incorporating modern elements, a rich variety of dragon pattern designs were created [14]. The research includes symmetrical and balanced designs. Symmetrical designs feature the dragon's head facing the viewer, with the body encircling to form a circular pattern, maintaining the traditional symmetrical structure. This design emphasizes traditional symmetrical aesthetics, presenting a correct and harmonious visual effect. Balanced designs exhibit the dragon's dynamic beauty through O-shape, S-shape, C-shape, 8-shape, 9-shape, and spiral forms. In O-shape, S-shape, and C-shape designs, there are both left-side and right-side configurations, increasing design flexibility and diversity. These innovative designs, while retaining traditional elements, enhance the pattern's fashion sense and visual impact through simplification and modernization.

5.2 Pattern Applications

5.2.1 Application Methods

In pattern applications, this study primarily used two methods: direct application of the original pattern and deformation application based on clothing styles [17]. The direct application retains the complete form of the circular dragon pattern, presenting the essence of traditional culture on the garment; deformation application based on clothing styles involves adjusting and simplifying the pattern to better meet modern aesthetic requirements. For example, in Figure 7, the S-shaped dragon pattern, through geometric deformation and the combination of sequin embroidery, is applied to the front chest of the evening dress, making the design both simple and modern. Additionally, in Figure 8, the S-shaped dragon pattern combined with realistic floral designs is applied to the front chest of a T-shirt using hot drilling techniques, adding a three-dimensional effect and fashionable luster.

5.2.2 Application Positions and Techniques

In the study, the application positions of the patterns mainly include the front chest, back, shoulders, sleeves, hem, and pants legs. The application in different positions directly affects the overall visual effect and aesthetics of the clothing. The front chest and back, as visual focal points, are suitable for displaying complex and detailed patterns, such as the extended design of the 9-shaped circular dragon in Figure 10. Shoulders and sleeves are suitable for displaying simple patterns to enhance the coherence of the overall design. Hem and pants legs are suitable for displaying dynamic patterns, such as the S-shaped circular dragon design on the evening dress in Figure 7. This layout better showcases the unique artistic charm and decorative effect of the patterns.

Pattern applications employ multiple techniques. A single item can use one form of technique or a combination of various techniques. In most cases, one primary technique is used, including sequin embroidery, hot drilling, embroidery, and printing [18].

For example, sequin embroidery enhances the garment's gloss and luxury, while hot drilling adds a three-dimensional effect and fashionable luster. Embroidery increases the layering and artistry of the pattern, and printing makes the pattern colorful and visually impactful.

The combined application of these techniques allows traditional circular dragon patterns to present a rich variety of visual effects in modern clothing design, meeting the design requirements for different occasions and needs [19]. Through these methods and techniques, this study demonstrates the diverse applications of traditional circular dragon patterns in modern clothing design, preserving the essence of traditional culture while imparting new fashion vitality to the garments.

6. Limitations, Implications, and Further Directions of Research

In the process of innovative design, the alteration and preservation of traditional circular dragon patterns are crucial issues [20]. This study simplified and modernized the dragon pattern structure while preserving the core traditional elements to ensure the designs have modern aesthetics without losing traditional cultural connotations.

In innovative designs, the most prominent features of the dragon are the head and body [21]. These parts are retained in the design, while other structural parts can be omitted. The basic form and details of the dragon's head (such as eyes, whiskers, and horns) are preserved in all innovative designs, maintaining the traditional dragon pattern's majesty and mystery while enhancing the cultural identity of the design [22]. Although the structure of the dragon's body is simplified, its basic outline and posture (such as coiling and soaring) are still retained [16]. This preservation ensures that the pattern remains visually recognizable as a traditional circular dragon motif.

In terms of changes, the simplification and diversification of the dragon's body are major points of innovation. In balanced designs, the dragon's body is simplified into geometric shapes, such as O-shape, S-shape, C-shape, 8-shape, 9-shape, and spiral shapes. This simplification not only gives the dragon pattern a more modern feel but also facilitates integration with other modern design elements (such as geometric

patterns and abstract motifs). For example, the dragon head in the O-shaped structure can be positioned on the left or right side, enhancing the pattern's flexibility and dynamic beauty. Additionally, traditional dragon mane in the design is combined with modern elements (such as feathers and flowers), making the dragon pattern more decorative and fashionable. This design strategy not only enhances the visual impact of the pattern but also increases its acceptance and appeal in the modern fashion market.

By preserving the core elements of traditional circular dragon patterns, modern design can inherit and promote traditional culture, which is significant for protecting and promoting cultural heritage. Modern design techniques and diversified changes make traditional circular dragon patterns radiate new visual effects and fashion sense. This integration not only enriches the language of modern fashion design but also enhances the adaptability and appeal of traditional elements in contemporary design, increasing the visual impact and market acceptance of the patterns. Innovative design allows traditional cultural elements to be accepted and appreciated in a broader market, promoting the development of the cultural industry. This study demonstrates the methods of combining traditional elements with modern design, providing new ideas for future design and inspiring more innovative creativity.

Although this study has made some significant findings, there are still some limitations. The sample selection and specific application environments of the designs may limit the generalizability of the results. The study design mainly relies on qualitative visual effect analysis, lacking quantitative data support. Future research can further explore the application of other traditional patterns in modern design, especially those cultural elements that have not been fully developed. Additionally, quantitative research methods can be used to evaluate the acceptance and impact of different designs in the market. Further research can also consider applying innovative designs to different cultural backgrounds and market environments to verify their universality and adaptability.

Overall, this study successfully achieved the integration of traditional culture and modern fashion through innovative designs and diverse applications of traditional circular dragon patterns. These innovative designs not only enrich the design language of modern clothing but also provide new ideas for the inheritance and development of traditional culture. Future research can continue to explore and expand these design methods, promoting the continuous innovation and development of traditional culture in modern design.

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