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Original Article

## Design of the Mogao Caves Caisson and Its Application to Modern Interior Design

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**Abstract:** Dunhuang Grottoes is one of the treasures of ancient Chinese art, famous for its exquisite murals and sculptures. The decorative patterns in the grottoes are rich and varied with brilliant colors, demonstrating the fusion of the cultures of the Central Plains and the Western Regions. The caisson motifs, in particular, are grand in scale and rich in variety, leaving a deep impression on people. These motifs complement the architectural structure of the grottoes, and together, they form a beautiful and harmonious artistic landscape. After China entered a fully industrialized society, the national culture of modern design in architecture became stronger and stronger, and caisson motifs are constantly being re-explored and applied to interior design. This study uses observational and case study methods to explore the relationship between traditional decorative motifs and modern design by examining the application of caisson motifs from the Mogao Grottoes in interior design. It is found that combining traditional caisson patterns with modern design is a feasible path, and the combination of traditional decorative elements and modern design, on the one hand, breaks the limitations of the current design, improves the aesthetic value and humanistic value of modern design works; on the other hand, it enriches the personality and emotion of the design works, enriches the expression of modern design, improves the overall image of modern design, and gives a new vitality.

**Keywords:** Mogao caves; Caisson pattern; Traditional elements; Interior design; Modern design; Decorative arts.



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### 1. Introduction

The Mogao Grottoes are located in Dunhuang, at the western end of China's Hexi Corridor. Its excavation lasted about 1,000 years, from the Sixteen Kingdoms to the Yuan Dynasty, and is unique among Chinese caves. It is an excellent artistic treasure trove of ancient Chinese civilization and an important witness to the dialogue and exchanges between different civilizations that once took place on the ancient Silk Road. Mogao Grottoes, with 735 existing caves and more than 45,000 square meters of preserved murals, epitomizes the development and evolution of Chinese cave art and enjoys a high historical status in

cave art. Mogao Grottoes art through the dynasties, the caisson pattern is an important part of the Dunhuang cave art, which decorates and connects the grottoes in the building, sculpture, and murals, but also has its independent form. With the pattern decoration, the grotto art is complete and can fully demonstrate its prosperity and beauty. These brilliant and colorful motifs light up the dark and airtight grottoes, giving them a captivating glow and allowing everyone to experience the harmonious beauty of this artistic creation.

Exploring caisson motifs' artistic characteristics and evolutionary patterns is useful for the entire cultural lineage and inheriting the traditional artistic and cultural heritage. The study of caisson pattern, the imitation of wooden structure, applied to the grotto, through the pattern of structural expression of the hierarchical progression, in the heyday of the Sui and Tang dynasties is the continuous acceptance of the fusion of foreign artistic styles, and the local art and culture of the confluence of the excitement, the launch of a unique charm, leaving behind a rich and beautiful pattern for posterity to learn and refer to. A good modern design reflects the country's vitality and multiculturalism, fully embodies the heritage of historical lineage, and expresses the importance of people and nature. caisson pattern in modern design, the representative design elements of Chinese culture, and the current design together (Su et al., 2023) for the development of traditional Chinese patterns laid a solid foundation for the development of the Mogao Grottoes. The application and promotion of caisson patterns in modern design provides a broader platform.

## 2. Overview of Caisson

### 2.1. History of Caisson

The earliest written record of the word caisson is Zhang Heng's "Xijing Fu" in the Han Dynasty of China, so the decorative form of "caisson" has appeared in architecture since the Han Dynasty. However, the development of the times has also changed the meaning of the word caisson. From the Han Dynasty to the Tang Dynasty, "caisson" referred to a square latticework of continuous ceilings with lotus flowers painted in the square wells. Development to the Song Dynasty, the "building method" in the ceiling is clearly divided into three categories: Ping Ge, Ping Qi and caisson, caisson is clear for the smallpox raised up for the dome-like structure. caisson semantics of the era of change, from the broader smallpox collectively referred to narrowly refers to the upward projection of the local. With the subsequent development and evolution, the formal characteristics of the word caisson became more distinctive (Song, 2021).

Ancient people for nature has always been full of fear, ancient philosophers put forward a lot of ideas are also sought after nature, from ancient times to the present day are respected "the circle of heaven and earth" ideology, which is also the understanding of nature to the universe. Thus, the ancients in order to express this worship of nature's good intentions in the interior of the construction of a day, so slowly arose "dome high up, such as umbrellas such as cover" of the building interior decorative structure, known as the caisson. caisson contains a deep Chinese traditional cultural thinking, expressed the ancients for the exploration of nature and at the same time, the caisson of the ancient people for the good intentions. The caisson contains deep traditional Chinese cultural ideas and expresses the ancient people's desire to explore nature, and at the same time, the caisson's structure of interlocking wood also adds to the beauty of the building.



Figure 1. Mogao Cave 322 Caisson

Mogao Grottoes caisson is a branch of caisson, but also caisson in the fine. Mogao Grottoes caisson simplified the structure of the traditional wooden caisson, because of the material of the grotto, and the tomb caisson is more similar to the caisson, caisson is mostly located in the center of the grotto, high in the Buddha or the top of the grotto (Figure 1). Due to the high position of the top, so less erosion by the harsh environment, well exempted from human damage. caisson center raised on all sides of the slope, become the bottom of the big top of the small dipper shape, square wells in the drawing of the theme, the surrounding decorative motifs layer by layer rendering, side decorations are clear and exquisite, caisson decorations throughout the grottoes with a sense of space and a sense of mystery and marvelous. Dunhuang caisson up to more than four hundred, each cave caisson drawing is very delicate and gorgeous, full of exotic flavor, let a person breathtaking (Jiang et al., 2022).

## 2.2. Basic Structure of Caisson

The overall shape of the caisson follows the traditional Chinese architecture on the round bottom of the structure, and China's "circle of heaven and earth" ideological concepts echo, and the dome in the Western church, are symbolic of the celestial microcosm, the sublime sky. caisson is located in the interior of the upper, most of the overlaying bucket, by the fine arch support, complex structure and distinctive layers, depicting vivid decorative beauty, this traditional wooden structure, the use of interlocking wood staggered arrangement and unique performance techniques to create a sense of profound space in the environment (Wang et al., 2022). The structure is complex and layered, vividly depicted and beautifully decorated, this traditional wooden structure, the use of interlocking wood stacked arrangement and unique performance techniques, shaping the environment of the sense of profound space (Law & Blishen, 2024). It is worth mentioning that the complex decorative techniques always maintain the sense of regularity and integrity of caisson, which is precisely the marvelous thing about caisson. Here, two main types of caisson structures are presented. Dou four caisson (Figure 2) is mainly a mode of caisson in the Han Dynasty, and also a major structure in the early stage of the development of caisson. The overall structure of Dou four caisson is relatively simple, with a square bottom, two layers of squares stacked on top of each other in the square, each side of the middle point connected to rotate by 45 degrees, and all kinds of floral motifs painted in the center and around the periphery. The Dou four caisson, as the basic structure of the initial caisson, laid the foundation for the caissons after the Han Dynasty, and the caissons of the Wei, Jin, and North and South Dynasties also continued this structure.



Figure 2. Mogao Cave 305 Caisson

After the Dou four caisson, the caisson structure began to become more enriched, giving rise to the Dou eight caisson, which was a common form of Song dynasty caisson used for the top and central parts. The Dou eight caisson (Figure 3) was a common form used for the top and center of the caisson during the Song dynasty. This period of transition was an important stage in the development of the caisson, which was stereotyped and retained its early features in the midst of the mutation. The practice is divided into three parts: the lower part of the square, square wells on the arch; the middle part of the octagonal, octagonal and square formed between the corner of the cicada, the corner of the cicada does not apply the arch; the upper part of the dome, Dou eight caisson of the top of the center of the mirror.





**Figure 3.** Da Xiong Bao Dian, Shuozhou City, China, Jin Dynasty

Octagonal round well is the main style of the Ming and Qing Dynasties, Ming and Qing Dynasties caisson top center of the mirror increased significantly, the style is detailed and complex, decorated with gorgeous gold, most of which retained the Song Dynasty, the basic structure of the bucket eight wells. Octagonal round wells are also divided into three parts, the upper level for the round wells, the middle level for the octagonal wells, the lower level for the square wells, square wells around the outermost layer of the An arch, square wells on top of the Schwarzkopf, so that the mouth of the wells into octagonal shape. Octagonal round wells of the corner of the increase in the number of cicadas, octagonal wells are equipped with patterns on the inner corner square, the octagonal shape is gradually reduced to a round shape, in the eight wells evolved on the basis of the octagonal round wells. Round wells above the arch, Yunlong carvings, the use of gold-plastered technique performance, a strong decorative effect.

### 2.3. Decorative Cultural Heritage of Caisson

The caisson pattern of Dunhuang is a technique of imitating the square well structure of the roof of ancient Chinese buildings, and then using different patterns for splicing and combining, that is, a kind of square well structure and decorative technique made of square wood stacked on the roof of the palace interior. In ancient China, most of the buildings are mainly wood structure buildings, so far not many well-preserved, because the wood is easy to decay, there is another reason is that the wood is easy to burn. So fire prevention becomes a problem that people need to worry and concern about, and avoiding fire is the desire of people's heart. There is a deeper theory that fire is a sign of calamity, a warning from heaven to those in power, hoping that those in power will be alert, correct their mistakes and learn from their mistakes. Thus, the ceiling of the palace was decorated with caisson to avoid fire on the one hand, and not to have such a cataclysmic sign on the other, in order to maintain the stability of the rule.

After the discovery of fire, human beings knew the advantages and disadvantages of fire. Due to the bottom of productivity at that time, in order to survive and develop to avoid harm, ancient people lacked effective means of subduing. So in order to express their good wishes and fulfill their spiritual needs and desires, they made special treatment of caisson in architecture. Wei Jin and North and South Dynasties period, the introduction of Buddhism makes the Mogao Caves caisson on the Western style characteristics, resulting in a new pattern of Buddhist style. Moreover, in Buddhism, the lotus flower is fragrant and clean, mostly for the throne of Buddha and Bodhisattva, the lotus flower symbolizes the holy and bright, illuminating the world of pure land in Buddhism, so caisson also contains the beauty of Buddhist culture.

In China, caisson more distributed in the imperial palace, temple, tomb and other places, was umbrella cover over the bucket shape, arch support, decorated with exquisite patterns, brightly colored paintings, gold relief and other decorations. Dynasties through the form of decrees to strictly regulate the construction

of buildings, the scope of the use of algae open, visible caisson clearly demonstrates the ancient hierarchy, especially the dragon and phoenix pattern, it is the highest level of the royal building can only be used. Not only that, caisson also symbolizes the traditional Chinese "unity of man and heaven" ideology. It is a revelation of a kind of harmony and unity of man and nature, because of the worship of nature's fear of the heart, so in the interior also give "heaven" to pay special attention to, which is the caisson decorative cultural connotations, in line with the ancient Chinese "circle of heaven and earth" of the universe, is the unity of man and heaven. This is also the cultural connotation of caisson decoration, which is in line with the ancient Chinese cosmology of "heaven, earth and circle", and is the embodiment of the concept of unity of heaven and man in architecture. The delicate structure of these caisson makes the original emotion of "conforming to heaven's reason and conforming to heaven's will" preserved along with these buildings to this day, showing the aesthetic idea of the unity of heaven and man.

### **3. Decorative Art of Caisson Motifs**

#### **3.1. Jin Dynasty Mogao Caves Caisson Pattern Characteristics**

Dunhuang Jin Dynasty tombs, a number of burial chambers have lotus caisson, lotus petals eight pieces, petal end pointed shape, the same as in the Central Plains, one of the burial chambers of the lotus square well periphery painted with a two-channel border, which is also the earliest multiple border decorative caisson motifs. This is also the earliest multi-bordered caisson pattern. It can be seen that the caisson pattern of the Northern Dynasties at Dunhuang has a lineage with it. Dunhuang early caisson pattern, the Western style is strong. North Dynasty decorative motifs are mainly based on the Lonicera and Lotus patterns; in the Western Wei and Northern Zhou periods, some animal motifs were added, and there was an organic combination between the patterns and the decorations. Overall, the Mogao Grottoes caisson patterns of the Northern Dynasties are solemn and simple, with a bold and free style, contrasting colors, and expressing a simple and free temperament.

#### **3.2. Characteristics of caisson patterns in Mogao Caves of Sui Dynasty**

During the Sui Dynasty, the most caves were built in Dunhuang, and Buddhist culture was advocated and promoted throughout the country, therefore, Buddhist culture injected new blood into the cave art. The Mogao Caves caisson patterns of the Sui Dynasty absorbed the culture of the previous generation, and after exploration, absorption, fusion and development, formed a distinctive feature of the era. Sui Dynasty patterns, especially to symbolize the caisson for the representative of the Huagai, caisson pattern of the structure of the form, the content of the subject matter, the drawing method of a hundred flowers competing. Sui dynasty caisson mainly has two forms, one is to retain the ancient stacked Dou four caisson structure, one is the center of many wide spaces to facilitate the painters to play creativity, the paintings. The caisson pattern of the Sui Dynasty inherited from the Northern Dynasties and started from the early Tang Dynasty. Although this transitional period is relatively short, it is very rich in content, showing the style of different periods in the early, middle and late periods, with obvious characteristics of the times. Early Sui Dynasty, four sets of stacked caisson to bucket mainly, although still maintains the structure of the Northern Dynasties of the set of bucket, but the pattern is to create a new situation, beasts, three rabbits, lotus, hanging mantle, breaking the old style of the Northern Zhou Dynasty, the style of novelty and uniqueness. In the middle of the Sui Dynasty, round lotus caisson, lotus caisson, lotus caisson, colorful. Late Sui Dynasty, is the peak of pattern development, the emergence of Central Asian style caisson pattern. Sui Dynasty patterns of slender and beautiful, free and lively, dashing and handsome style characteristics.

#### **3.3. Yuan Dynasty Mogao Caves caisson patterns of features**

There are fewer caissons in the Yuan Dynasty, and there are two main forms. One is by the Tibetan images and twining branch pattern composition of caisson pattern, is the continuation of the Western Xia caisson style; the second is by the Tibetan images and scroll pattern of the main pattern of caisson pattern, is the new Tibetan Tantra decoration style. These two different caisson styles, reflecting the change of the grotto decoration in the period of alternation between the old and the new. Mogao Grottoes Yuan dynasty, 465th Cave (Figure 4), five Buddha caisson, caisson center to Tibetan images as the main content, the center of the square well painted with a seated Buddha Dainichi Rulai, the top of the cave concave upward two times, the top of the cave four slopes of the four sides of the painting of the Buddha in the south-east, west, north and south-west, and the Dainichi Rulai together as the five square Buddha. Square well around the edge of the decoration without hanging mantle, the emergence of new patterns such as scrolling clouds back to the pattern, peony flower pattern, scroll scroll pattern.



**Figure 4.** Mogao Cave 465 caisson

Yuan dynasty caisson of the border is also very delicate and numerous. Yuan Dynasty Yulin Cave 4th Cave, the caisson border on the roof of the cave is the upper end of the inner heavy drape, the following is a continuous image of the seated Buddha, and then under the entwined peony motifs containing pomegranate rosettes, fine and beautiful carving, and at the bottom of the drape motifs of bead strings decorated with the color of the border layers directly echoed the beauty of the world. Each dynasty caisson pattern clever and harmonious combination of layered colors, to the Mogao Caves has brought a unique charm. Pattern pattern of splicing combinations of both decorative caves top of the center, and each alga and pattern and unique characteristics and meaning of the era.caisson theme, structure, coloring, technique with the development of history and absorption of collision, fusion and evolution, not only broaden the caves of the sense of space and the sense of depth, but also produces a strong visual impact. This special significance of the caisson pattern, the formation of Dunhuang unique decorative arts expression, but also help us to better understand the Dunhuang cave art in the future, and transported to today's art design ([Khatchadourian, 2023](#)).

#### **4. Application of caisson pattern in modern design**

##### **4.1. The Great Hall of the People of China**

The Great Hall of the People is also a symbol of the Chinese nation, on behalf of the image of China, from an overall view of the Great Hall appearance spectacular and majestic, glazed tile eaves brilliant, corridors and columns tall and majestic, the overall solemnity.



**Figure 5.** Ballroom of the Great Hall of the People



The Great Hall of the People in the design of the full embodiment of traditional Chinese decorative arts features, decorative themes graceful and generous, prominent national characteristics, but also the early use of Dunhuang caisson pattern for architectural design is a typical representative (Feng, 2020). The ballroom of the Great Hall of the People (Figure 5), also utilizes Dunhuang caisson elements in many places. The ceiling of the ballroom is inlaid with crystal glass ceiling lamps, surrounded by gilded plaster sculptures and checkerboards of colorful caissons, and Professor Chang Shana said at the 2007 International Symposium on the Inheritance and Innovation of Dunhuang Mural Paintings that "the style of the ceiling and lintel decorations in the ballroom of the Great Hall of the People is derived from the caisson decorations of the Tang Dynasty in Dunhuang, with elements similar to the lotus flower in the 31st cave caisson of Mogao Cave in the Sheng Tang Dynasty.

The style of caisson decoration is derived from Dunhuang's Tang Dynasty caisson decoration, which is similar to the lotus flower in the 31st caisson of Mogao Cave of the Sheng Tang Dynasty, and combines the needs of architectural structure, lighting, ventilation, and other functions with the decorative style of the Great Hall of the People in the form of gypsum flowers in relief, which is the unique national form of the Great Hall of the People." Because it is applied to today's architectural design, caisson has a reduced sense of depth compared to that in the Dunhuang Grottoes, and basically unfolds on a flat surface. The modeling is an eight-petal lotus nesting structure, the combination of dots and lines, with a strong decorative effect. And combined with the practical needs of modern design, caisson well center is a large top light, the outermost circle of the petals along the spherical bulb plays a lighting effect, close to the petals with eight round top light; in addition to the round frame in the lotus hollow shape, connected to the ventilation pipe, play a role in indoor public space ventilation, beautiful and practical.

#### 4.2. Lanzhou Railway Station

Lanzhou Railway Station is an important railroad hub in Northwest China, and the design of the top of the waiting hall of Lanzhou Railway Station is a typical case of successfully applying Dunhuang caisson in modern architectural design. The top of the decorative mural "Xiangyin Shenqu", Dunhuang Research Institute staff used a variety of caisson patterns, the overall top of the caisson form of the outer square and inner circle, without too much structural modification of the caisson, the caisson of the height of the small difference between the mural depicted with the arc within the round well. The center part of the mural applies the representative three rabbit's lotus caisson of the Sui dynasty, three rabbits and three ears cleverly share the rabbit ears, to achieve visual integrity, expressing a sense of infinite movement. Lotus pattern surrounded by eight shapely Dunhuang flying image, flying beautiful shape, colorful belt flowing, prancing and lotus between, the outer edge of the use of regimental pattern of deep and shallow line outline, a good show of Lanzhou's historical and cultural landscape. The Dunhuang caisson pattern (Figure 6) chosen for the Lanzhou Railway Station is redesigned and recreated in combination with modernization, showing well the local cultural heritage and regional style characteristics of Gansu Province.



Figure 6. Top of Lanzhou Railway Station Waiting Hall

In this modern public space of the train station, the use of caisson pattern brings cultural infectivity to the people coming and going all over the world, and the classical and elegant caisson pattern allows the travelers to get a rest for their souls.

### 4.3. China Zhongshan Mausoleum Hall

Today's design emphasizes the use of regional and national culture, Dunhuang caisson pattern as a traditional decorative symbol, used in modern design, the essence of traditional caisson elements combined with modern design, enriching the cultural connotation of today's design. Nationalization and modernization are not contradictory, Dunhuang caisson in modern design has a very broad development prospect. Nowadays, many modern design works use caisson elements. The top of the sacrificial hall of the Sun Yat-sen Mausoleum is a typical caisson, which is inlaid with flower magnets, the KMT's emblem of the Blue Sky and White Sun (Figure 7). In the tomb, the vaulted roof over the full-body alabaster statue is also a caisson of the KMT's Blue Sky, White Sun Party emblem, and the application of caissons in these two places focuses the viewer's vision on the novel, simple, and colorful caisson pattern, which shapes a kind of respect and embodies the lifelong pursuit of Dr. Sun Yat-sen.



**Figure 7.** Top of the Altar of Zhongshan Mausoleum

In the future specific design work, combined with the background of the new era and new technology, designers should re-examine the Dunhuang grottoes caisson this decorative component with a developmental perspective, the need for innovative thinking on the interpretation of the traditional graphics, the combination of tradition and modernity, the Dunhuang caisson pattern recreation, so that the design of the Dunhuang caisson design forms of expression are rich and varied, and to retain their National style features with the times, so that it has both traditional national characteristics, but also has a distinctive style of the times. Dunhuang caisson pattern in this regard brings great inspiration to modern design, but also for the future design to provide more material and inspiration, so that the traditional pattern elements in modern design has a broader development prospect.

## 5. Value of Caisson Pattern in Modern Design

### 5.1. Aesthetic Visual Value

Beauty gets depends on the eyes of the audience, visual beauty is the enjoyment of people's senses, the spirit of today's modern design is to be able to embody human emotions, to meet people's aesthetic interests, and to express people's will behavior, so good visual enjoyment is the basic point that modern design must be done. Mogao Grottoes caisson pattern represents a part of traditional Chinese cultural elements, the pattern itself is a kind of artistic expression, caisson pattern unity in the rich changes, balanced and symmetrical, strong sense of rhythm, to meet the need for space. Mogao Grottoes caisson pattern is basically axisymmetric structure, and it is because of this symmetrical structure, even if the more complex and ornate decorations, will not affect the overall sense of order of the caisson, but presents a rich sense of rhythm and regularity of the sense of order. This structural form also makes the overall space produce a progressive far-reaching effect, presenting a dynamic compositional beauty (Zhuo, 2018).

The pattern of caisson is also an important direction from which modern design can draw. The beauty of the Huagai of the Northern Dynasty, the lotus pattern and twining branch pattern of the Sui Dynasty, the Nendoroid pattern, Baoxiang flower pattern, lotus pattern and flying image of the Tang Dynasty, the dragon and phoenix of various animal patterns of the Five Dynasties and the Song Dynasty, and the flamboyant



borders of the Xixia and the Yuan Dynasty, the combination of arrangement and the structure of the style of these patterns can be used in today's design. There are also the color tones of the patterns, the expression of overlapping halo, the basic color laws, this Dunhuang-style color symbols, in different dynasties have shown different color styles, which are worth studying and researching in today's design. The beauty of traditional pattern elements, in the development process of continuous integration and innovation, and finally formed a national personality full of aesthetic value system, making the Chinese traditional aesthetics has the characteristics of endless life.

## 5.2. Traditional Cultural Value

Mogao Grottoes caisson pattern is the flash point of traditional Chinese culture, is a treasure left to us by history, no matter ancient or modern, are worthy of our serious study and research. Culture needs to be exchanged, on the basis of accumulation of innovation, Mogao Grottoes caisson pattern self-contained system of artistic expression, cohesion of multi-cultural nutrients, designers through the subjective consciousness and self-needs of the Mogao Grottoes caisson pattern redesign, inheritance of China's outstanding cultural heritage, the Mogao Grottoes caisson pattern of this across the cultural and ethnic, geographical time and space. The Mogao caisson pattern is a form of art that transcends culture, race, region, time and space to maximize its beauty. Mogao Cave caisson pattern highlights the lines, embodies the rhythm, exalts the melody, conveys the spirit, through the Mogao Cave caisson pattern as a carrier, expresses the aesthetic pursuit of Chinese art (Russell-Smith, 2005).

The derivation of human culture into modern design, promotes and coordinates the development of modern design, pays attention to the humanistic history and national temperament of modern design, and embodies the overall cultural image of a nation and its creative way of thinking. creative way of thinking. Western modern design pursues openness and rationalization, while Chinese design is a top-down development, the cultural connotation of modern design, the characteristics of the times, cultural concepts and aesthetic psychology is particularly important today, and modern design has begun to pursue development and innovation. Modern design must pay attention to the development of history, the changes and development of modern design should have the imprint of the historical lineage, reflecting the public's concerns and needs and the cultural personality of history, and reflecting the traditional cultural value of today's design.

## 5.3. Economic Benefit Value

Mogao Grottoes caisson pattern is the best of Dunhuang decorative patterns, the caisson pattern as a design element, can be very good with the audience to establish a connection, without words, but simply through the pattern to express communication. caisson pattern in the lotus pattern, lotus leaf pattern, entwined branches pattern, caisson pattern in the mythological story, the beautiful image of the flying sky, have given people in today's industrialization and information technology. In the industrialization of information technology in today's people, brought the auspicious symbolism and good wishes, people are curious about the exchange of Western culture and the collision of the culture of the Central Plains, the desire to get in touch with the most primitive and natural things, and the Mogao Grottoes caisson pattern is just to meet the people's for the primitive, for the nature of the desire. This combination of traditional and modern not only enriches the form of traditional decorative pattern elements, but also the application of traditional elements can be very good to attract the attention of consumers, skillfully with the audience on the visual spirit of the double communication, conveying the information of the design work, making it easier for consumers to accept, pulling the growth of consumption, thus generating economic value.

## 6. Caisson Pattern Application Methods in Modern Design

### 6.1. Direct Use of the Whole

The decorative effect contained in caisson itself is an excellent source of material for modern design, whether in terms of structural form, decorative patterns or color matching. Reasonable use of Mogao Caves caisson pattern for decorative design, not only can strengthen the visual impact of modern design, highlighting the characteristics of modern design decorative arts. At the same time, it can also show the profoundness of traditional culture on the level of psychological perception. The number of Mogao Cave caisson patterns is huge, with different characteristics in different periods, and designers design and utilize Mogao Cave caisson patterns in both direct and indirect ways. The direct use of Mogao Grottoes caisson motifs refers to the modern design works above, localized use or the whole directly to show the pattern. For example, the graphics in Mogaoku caisson are directly used in the pattern design of clothing, and the original form of Mogaoku caisson pattern is directly given in the design of product decorations (Shao, 2016). With this method of direct application, the motifs are virtually unaltered and undeformed. This overall direct use of high reduction retains the authenticity of the work, with strong traditional colors,

respecting the decorative and integrity of the traditional pattern and the compositional characteristics of the caisson pattern. This application method can be directly applied to all aspects of the square scarf pattern, coasters and tea mats, decorative paintings, etc., presenting the pattern essence of caisson pattern and clearly expressing the intention of the design work.

## 6.2. Indirect Application of Patterns

Nowadays, the traditional patterns in modern design are no longer just the direct use and mechanical repetition of patterns, but the use of modern design concepts and methods to give the traditional patterns a new form. Mogao Grottoes caisson patterns in today's design, most of them are refined and changed, extracted characteristic and representative elements to organize, generalize and deform, so that they adapt to the needs of the design. Mogao Grottoes caisson pattern includes many patterns, such as the commonly used lotus pattern, Baoxiang flower pattern, flying modeling, three rabbit pattern, geometric drapery, tassel beaded border, etc. Designers can refine these classic symbols, retain its basic unit shape, by simplifying the shape of the structure and cumbersome decorations, so that the graphic simplicity. Secondly, abstract changes, secondary deformation integration, and even appropriate subjective exaggerated changes can be made to strengthen the decorative effect of the main body. Again is the modern design using more decomposition and reconstruction, the separate caisson elements to be broken up, or filled separately, or balanced symmetry, or zoom deformation, the use of a variety of decomposition and combination of methods, splicing and mating, so as to create a new imagery of the pattern form, resulting in a decorative pattern in line with the modern design.

## 6.3. Emotional Expression of Color

Mogao Grottoes caisson has a very complete color system, especially the symbolization of decorative colors. If these symbolic colors are applied to modern design, it will make the design works have obvious characteristics. In the Mogao Grottoes caisson motifs, the color bias varies from era to era. For example, sui dynasty caisson to stone green, earth red, stone green, rich color, calm atmosphere; Tang dynasty caisson to ochre, vermilion, earth yellow, gold, color hierarchy, rich and colorful; five generations of the Song dynasty to stone blue, earth red, stone yellow, iron black, the color is relatively monotonous, the overall color bias of lime green, procedural; Xixia yuan dynasty period is to stone green, grey and blue, stone yellow, showing a Minority new style, monotonous color, tonal unity. caisson pattern of color proportion, with the way are with certain rules, including color processing methods, superimposed halo dyeing way to increase the caisson pattern of layering and three-dimensional sense, these in modern design are worth learning.

For the Mogao Grottoes caisson pattern color refinement and integration of change, both to show the logical discursive works, but also the sensibility of aesthetic lyricism, giving a person simple and generalized sense of aesthetics, color treatment method has a variety of ways, can be summarized according to the objective realism, but also can be summarized by subjective imagery. For example, changing the contrast between colors, expanding the difference in color area, and extracting characteristic colors according to the original drawings. Through various methods and the compositional characteristics of color itself, to achieve the reorganization of color relationships, resulting in a new visual language of color (Zhang, 2021). To inherit the traditional elements of the Mogao Grottoes caisson pattern, it is necessary to carry out in-depth research on it, especially the innovation of the application method, to analyze the color structure of the pattern of the caisson from the classical caisson, to extract its typical features and cultural connotations, and to integrate the Mogao Grottoes caisson pattern into the Mogao Grottoes caisson pattern, so that it will be more effective and more efficient. The Mogao Grottoes caisson pattern needs to be studied, especially the innovation of application methods, to analyze the color structure of caisson pattern from the classic caisson, extract its typical features and cultural connotation, and develop it into the elements in line with modern design.

## 7. Conclusion

Mogao Grottoes caisson pattern is a treasure of Chinese art and the art of the world. Its clear structural hierarchy, coordinated patterns, bright and rich colors, and wide variety of themes provide a rich source and valuable nutrients for modern design. Culture is the root of design and studying the decorative art features of Mogao Cave caisson patterns allows us to better obtain inspiration and sources for modern design from tradition. Through this study, we find that combining traditional caisson patterns with modern design is a feasible path and has a broad development prospect. Exploring the combination of traditional decorative elements and modern design, on the one hand, breaks all the limitations of current design, improves the aesthetic and humanistic values of modern design works, gives people historical associations and a fresh sense of traditional culture, makes the traditional elements collide and integrate with the modern civilization, and makes it become an effective carrier for spreading the art of Dunhuang; on the other hand,

exploring the combination of the caisson pattern and modern design, and Re-creation and re-design, enriching the personality and emotion brought by the design works, enriching the expression of modern design, improving the overall image of modern design, and renewing its vitality.

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