

Application of new materials and new processes for thread-bound books in the era of digital economy

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Abstract. With the continuous advancement of the digital age and the popularization of network technology, the development of thread-bound books must keep pace with the times. Designers should shoulder the responsibility of inheritance and development and strive to learn the essence of traditional thread-bound books, for modern book design services. Therefore, in the digital age, more possibilities are proposed for the future development direction of traditional thread-bound books. For book design, the application of new materials and new processes also reflects the trend of aesthetics. Thread-bound books are the carrier of information and the embodiment of civilization. Its emergence and development are a sign that mankind has entered the civilized era. At the same time, along with thread-bound books in history, along with the process of human life and production, the discovery and invention of new materials, and the discovery and invention of new substances, books, as witnesses of human civilization, are constantly changing their appearance to understand the changes in materials, technology and thread-bound books. The historical origin of design, understanding the flesh-and-blood relationship between materials, technology and books, in order to give greater meaning to modern thread-bound book design. **Keywords:** thread-bound books, digital economy, new materials, new processes

1 Introduction

Designers should keep pace with the times when designing books, and in the digital media era, pay close attention to the combination of art and technology. Deeply understand the expressive power of paper, printing technology and various materials, so that they can collide with traditional wire binding technology. Thus creating a new type of thread-bound book in the context of the digital age to meet the needs of the audience. The application of new materials is also one of the development trends of thread-bound books in the new era. The ancient Chinese craft literature "Kaogong Ji" records: "The sky has its time, the earth has its energy, the materials have beauty, and the workmanship has skill. If these four are combined, then it can be good." Among them, the idea of "beautiful materials and skillful workmanship" also affects The development of thread-bound books.

Materials can reflect the characteristics of the digital age. In the design of modern thread-bound books, the continuous emergence of various new materials and new processes has given thread-bound books new forms and trends. However, when using new materials, it is necessary to master the characteristics of the material so that it can match the content of the book and create an aesthetic feeling. The famous designer Mies van der Rohe said: "All materials, whether artificial or natural, have their own character. Before we deal with these materials, we must know their character. The value of

materials only lies in the use of these materials Can you create something new?"[8] For example, wood gives people a natural and friendly feeling; metal gives people a gorgeous and cold feeling; nowadays, the design of thread-bound books has more choices in the choice of materials. possibility. This is mainly reflected in the expansion of the range of online and substrate materials.

1.1 Line range expanded

Designers are constantly exploring new materials to replace traditional "lines". From the traditional "clear water white silk thread" to today's various materials such as leather, metal thread, wool, silk thread, and hemp thread. [6] Different materials and surface textures give people completely different visual and tactile feelings. For example, if you choose leather material for thread-perforated binding, the whole book will have a rough and bold feel. Designers must consider carefully when choosing materials. Are the materials relevant to the content of the book they are designing? Will it serve book content? Otherwise it will lose its meaning.

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Fig.1. "Wu Weishan Sculpture and Painting" and floor plan Designer So Tae Hee

For example, in the design of "Wu Weishan Sculpture and Painting" (Figure 1), two types of wires were boldly tried. The white line represents the painting part. Metallic copper wire represents the sculptural part. are related to their content. Compared with traditional thread-bound books, this is a great breakthrough for designers in the innovative design of online bound books. "Chinese Feminism" (Figure 2) is a series of thread-bound books. Each book is bound with a different color thread. Like the book "Wu Weishan Sculptures and Paintings" (Figure 1-33), thread binding is not the main binding method. Thread binding plays a decorative role in this series of books. Different colors such as blue, red, orange, and green are used to distinguish the series, and each color echoes the graphics and text on the book cover. The designer took into consideration the material, color, and binding form. The thread binding form not only plays a decorative role, but more importantly, the form fully serves the content, achieving a perfect combination of the two and reflecting the overall design concept of the book.[3]



Fig .2. "Chinese Feminism" and floor plan designer Zhang Ming

"Myspace.com" (Figure 3) is a foreign language book. The binding of this book is very special, with telephone wires of five colors interspersed between six holes. The rich colors of the threads echo the colors of the cover and inner pages. The winding direction of the telephone cord is different from the traditional threading direction. There is no sense of neat line segments on the book cover, but it is wound randomly around the spine of the book. And there are some similarities with the ring. Books are perforated and wired, possessing the basic elements of a wire-bound book. However, it is a bold attempt by the designer to innovate in the way of threading and completely change the original appearance. The colors of the five wires are mixed together, adding a sense of fashion and individuality.



Fig. 3. "Myspace.com"

This is a book design influenced by thread-bound books, from traditional double threads to today's multi-threads, from clear water white silk threads to threads of various materials. This phenomenon reflects the development of new materials in the context of the new era. Appearance brings endless creativity to designers.

1.2 Expansion of the scope of printing materials

With the continuous development of printing technology, the substrates for book design are becoming increasingly diversified. It has changed the traditional single form of paper books and expanded to metal, cloth, wood, nylon, plastic, glass and other materials. This gives designers more room to play. The collision between traditional handmade thread binding and modern material technology will produce a strong visual effect.[2]

"Shenzhen Graphic Six Exhibition" (Figure 4) is a picture album designed by designer Bi Xuefeng. The designer combined traditional thread-bound forms with modern materials to design a thread-bound book with a unique perspective. [1]This book uses new materials, changing the previous characteristics of using paper as the main printing medium. The use of film as the page design combines industrialization, modern temperament with the traditional thread binding method of humanism, creating a strong visual impact. The whole book has both contemporary and cultural characteristics, appropriately expresses the design concept of the book and is in line with the content of the book. Form and function are also perfectly combined. The wiring method is slightly improved on the traditional four-hole arrangement, from four holes to five holes. From a binding functional perspective, it increases its firmness.



Fig.4. "Shenzhen Graphic Six People Exhibition" Designer Bi Xuefeng

Another example is "Red, White and Blue with Light" (Figure 5), which was designed by Hong Kong designer Huang Bingpei. He uses conforming materials as the printing substrate for books, which is of course

also related to the content of book design. Red, white and blue culture is regarded as one of the representatives of culture. Therefore, the designer considered using traditional thread binding in Hong Kong to reflect the cultural nature of books. The wiring method is the same as that of "Shenzhen Flat Six People Exhibition" (Figure4), which is based on the traditional four-eye arrangement with a hole added. Due to the characteristics of the material, the punching point is far away from the spine to prevent the material from falling off. The fusion of traditional humanistic temperament and modern industrial atmosphere brings novel creativity and unique visual effects.



Fig. 5. "Red, White and Blue Everywhere"

Designer Huang Bingpei

"Scrap Book" (Figure 6) is an art book designed by Polish artist Peter Madden. Its form is similar to Chinese thread-bound books. Books are made from a variety of materials, including scrap wood, scrap metal, hemp rope, etc. The entire book, from the cover, inner pages to book binding, is all handmade. The cover is made of waste wood, with natural wood grain and embedded iron nails becoming the most natural decorative graphics on the cover. The whole book is like a wooden door, arousing readers' curiosity and guiding them to open the door. The wiring method is different from the traditional four-eye binding method. It only adds a vertical line at the top and bottom corners of the book to strengthen its firmness.

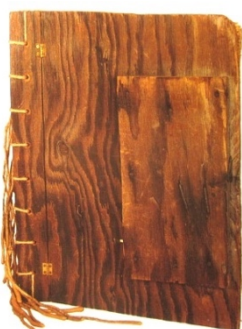


Fig.6. "Scrap Book" Designer Peter Madden

1.3 Application of new technologies such as printing and binding

Under the new technological conditions, machine stitching - thread binding has gradually become a new binding technique. Since the concept of punching and threading still exists, it can certainly be said to be a modern binding influenced by traditional thread binding.

Just like a sewing machine on cloth, it can create many patterns of threads. This kind of machine stitching can be used to bind books, and can also be used to create various patterns and text as decoration on book covers or inner pages, which brings more design inspiration to designers. [7] Machine operation can be used for mass production, and the production process is fast and rigorous. However, compared with traditional thread-bound books, it loses the human charm of hand-threading and the elegance of thread-bound books. And because this kind of binding has small holes, small wiring distance, high density, and the gaps between the pages are too tight, it is only suitable for thinner books or manuals. If the book is too thick, it will be difficult to read.

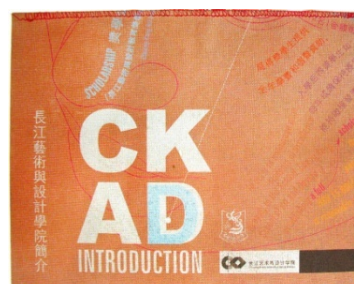


Fig.7. "Changjiang College of Art and Design Recruitment" Wu Yong, designer of "Birth Manual"

"Changjiang University of Art and Design Admissions Handbook" (Figure 7) is thread-bound, and another example is "Chinese Memory - Treasures of Five Thousand Years of Civilization" (Figure 8). This book is not actually a thread-bound book, but it can still satisfy readers. Feel the resemblance in form and spirit. Surrounding the spine of the book, a new way of routing is presented - traditional Chinese auspicious patterns are embroidered with red silk thread. Chinese embroidery is one of the traditional Chinese folk handicrafts and a treasure of five thousand years of civilization. Designer Lu Jingren skillfully displays this element in the book cover, which is consistent with the content and theme of the book. This is an inheritance and innovation of traditional thread-bound books.



Fig.8. "Memory of China - Treasures of Five Thousand Years of Civilization" Designer Lu Jingren

In the book "2004 Double Mo Hall" (Fig9), in addition to machine stitching at the stitching, modern technology is also used to inlay small metal parts at the punched holes. On the one hand, it can enhance the aesthetics of books, on the other hand, it also plays a protective role. The hole is larger and the thread can be

crossed at will. Increase engagement with your audience.[4]



Fig.9. "2004 Double Mo Hall"Design Chongmo Hall

"Taiwan International Poster Design Award 2005" (Fig10) The binding area of this book is engraved with plexiglass, adding new materials and new technologies. The whole book gives people a sophisticated modern feel, but also has a traditional atmosphere. Adding a hole to the traditional four-eye binding method increases the firmness of threading.

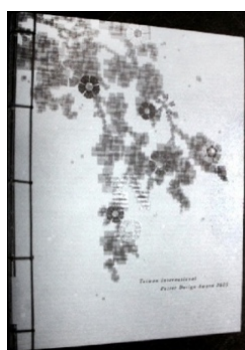


Fig. 10. Taiwan International Poster Design Award 2005》

The spine of this thread-bound book "AGI-New voice" (Fig11) is die-cut in the shape of an ear. This is a great highlight of this book. But the designer also put a lot of effort into handling some details. One of the traditional binding processes for thread-bound books is corner wrapping. The corners are usually wrapped with silk, on the one hand, to protect the book corners from damage and to enhance the firmness of the book. On the other hand, in order to increase its beauty. The four corners of this book are rounded and die-cut to help protect the corners. The designer uses modern craftsmanship to also protect books. In addition, the connection between the line and the book cutout is cleverly die-cut. While increasing the firmness of books, it also prevents books from being damaged by long-term pressure from the thread. In this book, in addition to die-cutting technology, special glazing technology is also done. On the black cover, black varnish is applied to the English "AGI" and "NEW VOICE" to create a sharp contrast in texture. [5]Throughout the book, the contrast between modern craftsmanship with industrialized temperament and traditional hand-threading craftsmanship with humanistic flavor makes the whole book visually striking and unique.



Fig .11."AGI-New voice"Designer He Jianping

In the context of the digital economy, designers can use many modern craftsmanship technologies to inject new vitality into thread-bound books. The intervention of new technologies such as glazing, die-cutting, hot stamping, embossing, and debossing can give design works stronger expressiveness and enhance the creative value of the entire design. Designers should understand and master the performance of various technologies. Only in this way can it be effectively combined with traditional handicraft technology to give thread-bound books a new era feel. Although new techniques are emerging one after another, you must remember: no matter how dazzling the decorative effect is, it can only shine when used at the right time.

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