Exploration on the application of 3D printing and dyeing patterns in modern clothing visual communication design

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Abstract: 3D printing and dyeing is a widely used pattern processing mode in the new era, which can adapt to the design requirements of visual communication and effectively enhance the aesthetic art taste and fashion of modern clothing. Based on the status quo, firstly, the characteristics of digital printing and dyeing technology are discussed. Secondly, the choice of the visual design of modern clothing is discussed. Finally, the application of 3D printing and dyeing patterns in the visual communication design of modern clothing is expounded. It can effectively improve the overall application level of visual communication design and lay a solid foundation for the progress and development of the fashion design industry.

1. Introduction
Digital printing and screen printing are all printing methods used in the market, which have certain requirements for fabric characteristics and structure. With the advent of 3D printing technology, it not only breaks the traditional fabric and structure constraints, but also realizes the enrichment and figuration of design works, and enhances the fashion sense of design. In order to further explore the performance of digital printing and dyeing technology in visual communication design, the basic characteristics of digital printing and dyeing technology are introduced as follows.

2. Characteristics of digital printing and dyeing technology
2.1 Characteristics of printing and dyeing methods
Digital printing and dyeing refers to the technology of printing and dyeing on 100% cotton fabric or 100% polyester fabric. This technology requires that the dye itself has certain activity and needs to be printed on the polyester cotton backing cloth, so as to show a strong sense of design and unique bright appearance. In contrast, the printing and dyeing effect of polyester cotton is poor. Although the cost of this printing method is high, it can improve the precision of the details, so it is very suitable for printing and dyeing requirements with high detail demands and small order quantity.

2.2 Printing process characteristics
Screen printing materials include different types of glue and acrylic paint, both of which have a certain market share. Commonly used internationally is the vinyl hot melt resin in ready-to-wear printing, which has certain applications in China. Compared with other materials, it has the characteristics of high image fineness and beautiful colors, and also has a good richness and layering with a strong sense of fashion. In addition, due to the strong sense of layering, it can also be applied to some perspective printing patterns, which has stronger expressive power. In addition, the ink also has opaque properties, so it can be printed directly on black dark cloth, which can be used as one of the preferred materials.
for black shirt printing. In the case of digital printing, the general process can be divided into two types: digital thermal transfer and image printing. After high temperature process, it is transferred to a suitable fabric. In this process, the ink pigments of digital printing belong to the dispersion type, so they belong to the dispersion dye type in the traditional printing and dyeing process. For the traditional printing and dyeing industry, the materials used are very practical and the requirements for the process of digital transfer printing are not high, and the relative environmental pollution is lower.

In the digital direct-injection printing process, it is necessary to refer to the image making requirements of the fabric ink pigment for implementation. When selecting different types of colors for digital printing, the color reproduction technology may be used. The ink used is four-color ink, which has higher transparency than other types of ink. Although the color is very bright, it is only suitable for a pure white underside, otherwise it will cause color distortion. On the dark bottom, a good job of white background is needed, and then use four-color ink direct jet to deal with it. The selection of ink and pigments should be focused on in order not to affect the color fastness, and the effect of washing should also be screened at the same time.

![Figure 1 3D Printing and Dyeing Garment Visual Effect Display](image)

3. Modern clothing visual communication design options

3.1 Colorless and multi-color design scheme

Different types of colors can be used in different styles of fashion design. In order to better display style and characteristics and enhance the integration of texture and color, it is necessary to integrate various elements to a certain height in order to show the overall fashion style and design effect. Among them, white is the representative color of the colorless system, which is often used in people's impression to express the holiness, brightness, pureness or beauty, such as the bride's wedding dress. Another colorless color is black, which is also a common color in life. It is often associated with nobility and gentlemen in fashion design, but also used in more solemn occasions. Thus, the colorless design scheme can be adapted to more social occasions and the wearer's needs.
3.2 Similar color design scheme

In the selection of color scheme, similar color design is also a common visual expression mode. Objectively speaking, any kind of color collocation must be based on the harmony of psychology and vision. For example, to emphasize the attraction of from decoration and foil part. From the perspectives of hue, lightness and purity, the combination and matching of colors can produce significant improvements. When choosing the color combination, pay attention to the matching between the different shades of light and the brightness and the tonality of the colors. These are the contents that can enhance people's recognition of the color harmony level. In the color scheme of the high-pitched tone, it gives an elegant feeling, such as white, light yellow and pink blue. In the design of women's clothing, it is often used in label design such as sexy, fashion and gentle, and is also very suitable for the season, like summer. In terms of color matching of purity, negative effects of hue should be avoided as far as possible. Design requirements of purity can be better enhanced by promoting hue selection tendency of colors, thus bringing stronger dynamic expressive force and enhancing lively penniless of design. When adjusting the color emotional appeal and the dynamic feeling of clothes, the choice of tone is also needed. When performing color matching, it is necessary to make full use of the difference in brightness and chromatic aberration to better control the color of the clothing. In many cases, the design level of clothing and the overall effect of visual communication will be closely related to the relationship between color and moderation. When the local design changes are made, the corresponding transformation will be reflected, but the overall uniformity and consistency are often It is the core of the designer's pursuit.

4. The application of 3D printing and dyeing patterns in modern clothing visual communication design

As the world's first well-known designer to use 3D printing technology, Alice is also a star of great concern in the fashion industry, and enjoys the reputation of "Queen of 3D Printing". From the point of view of the principle of technology, it is too abstract to adopt the conventional Project Muze technology. However, the problem of insufficient productivity exists in the use of IBM's design data for auxiliary design. Generally speaking, the use of Thread machine for learning and recommendation can play a positive role in promoting the effect. Not only can the same intelligent recommendation technology be adopted, but also the underlying analysis technology can be used. In this way, the application level of 3D printing and dyeing patterns in modern clothing design can be effectively broadened. In fact, visual communication is different from hearing and smell, it is often influenced by a variety of external factors, under the stimulus of light, the person's sensitivity change will also happen. Therefore, in the process of plate making, fabric selection should be done well to maintain a good luster of the fabric, so that the design can reflect the characteristics of connecting the past and the future as much as possible. Before clothes are made, a large number of designers' ideas and basic concepts should be integrated. The main difficulty in using 3D printing and dyeing patterns for plate making lies in the overall effect of the clothing after wearing, which involves the quality, stitching level and form of the cloth, etc. Only through continuous exploration and repeated research can we finally find a balance point.

In the three-dimensional space, the design of garment is different from the design in two-dimensional. It needs to design the constraints of the drawing expression level, and design while taking into account the technical characteristics and limiting factors of 3D printing. It is worth noting that the texture of the material should be chosen as close as possible to the characteristics of the material itself. In the application process of 3D printing technology, most of the special customers are customized for the products, so the material requirements of the artworks are generally high, which is one of the main reasons why the conventional 3D printing equipment can not meet the fashion design requirements. However, with the continuous development of technology, high-level printing equipment has gradually developed. For example, brands such as LV and Chanel have printed products with the help of new printing equipment. The overall display effect is good, but the distance is true. Marketization promotion still has a big gap, and it is necessary to continuously upgrade the
technology.

Researchers at the University of Hertfordshire have personalized the technology of 3D printing in their research. They use a variety of imitation forms to do 3D printing, including knitting, sewing and knitting processes. They also use flexible materials to implement 3D printing, so that the prototype can be made into a variety of color products. The whole process has complex interior control chain, slowly connected, but also has a unique layout structure, which adapts to the needs of industry development.

5. Conclusion
In summary, the 3D printing and dyeing pattern has significant advantages over the conventional printing and dyeing technology. It is not only restricted by the fabric and design, but also has stronger expressive power, and can control different types of design styles and visual communication effects. However, from an objective point of view, 3D printing and dyeing patterns are still in the stage of exploration and development, and there is still a certain distance from the use of mass production. Therefore, it is necessary to improve the market conditions and mature technology to achieve real promotion. Of course, this does not affect the value and expressiveness of its own surrealism, and it is still welcomed by the niche groups in the market.

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