

Research on the Rheology and Functional Application of Vest Clothing

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Abstract: The form of vest costume in China can be traced back to the Qin and Han dynasties. the vest costume is simple in shape but has both practicability and aesthetics. especially under the influence of the development of modern science and technology, the functional characteristics of vest costume have gradually become prominent. Through the study of the change and functional application of the vest clothing, the vest clothing designers can master more design rules and artistic connotation, which has practical reference significance for the modernization of vest clothing in China.

1. Introduction

After 5,000 years of historical baptism, the vest costume culture has followed the rules for making sleeveless tops without collars, although there are many differences in name and shape. Only changes have been made in collar shape, length and placket. The vest first refers to the horse armor, that is, the clothes of the horse, which gradually changed into the clothing form taken by human beings. Its functionality has changed greatly from the initial protection of soldiers to warmth, dress and functional vest. As a kind of clothing type, it has played a positive role in promoting the modernization of clothing design industry.

2. Historical Changes of Vest Clothing

2.1 The Shape of Vest Clothing in Different Dynasties

The vest costume culture has a history of 5,000 years. The characteristics of vest costumes with different names in different dynasties are as follows. First, vests from Qin and Han dynasties: long sleeveless jackets from the central plains, introduced by nomads from the north, are clearly recorded in "Shi Ming Shi yi (Liu Xi)". The second is the vest armor of the Southern and Northern Dynasties: it is a long sleeveless jacket and is a soldier's protective equipment. It is made of leather and metal. The armor plate is of fish scale type (chest back) or strip type (chest back below). The shape of the armor plate is different in each part for better pitching. The third is the half arm of Tang Dynasty: it is a short half sleeve shirt, which evolved from the short Ru. It has a long waist and wide cuff, and can be worn outside or inside the short Ru. Fourth, the girdle protection of Yuan Dynasty: it is a leather garment similar to a long mandarin jacket and a half sleeved shirt, and it is the basis for the design of armor in Ming and Qing Dynasties. Fifth, the Ming Dynasty's armor: it is a long vest type coat, which is mostly worn by the literati and common men. The armor is knee length, sleeveless or short sleeve, round neck, silk material, and is covered outside the narrow sleeve clothing. Sixth, the vest of the Ming Dynasty: clearly recorded in History of Yuan Dynasty, it is a long, sleeveless, collarless double-breasted vest with slits on both sides, similar to the modern vest. The seventh is the one-character lapel vest of Qing Dynasty: similar to the modern vest form. It is a short vest (length and waist) with a vertical collar. The styles of placket include large placket, pipa placket, double placket, herringbone placket and one-character placket.

2.2 Rheological Characteristics of Vest Clothing

The vest costume culture conforms to the development of the times and is influenced by social customs, social systems and other factors. It has undergone changes in decoration techniques, uses, shapes and other aspects. The shapes gradually converge, the decoration techniques become more

complicated and the uses become more multifunctional, as shown below. First, the external structure: the “sleeveless top” form of vest clothing in various dynasties has not changed much, and the differences are mainly reflected in the form of placket, collar, length of clothing and sleeve length. Ming and Qing Dynasties are more similar to the modern vest than the vest. Before the Ming Dynasty, the forms of vest clothing were different. After the evolution of the practical needs of the vest prototype, the adjustment of the length of the vest and the form of the placket was carried out on the basis of sleeveless, which also showed the characteristics of the ancient men of song and Ming Dynasty, such as gentle, graceful, bold and unrestrained, fresh and elegant lamp. The name of Qing Dynasty vest has been used up to now, which is similar to the shape of modern vest and provides an important reference for the structural design of modern vest. In response, the changing characteristics of vest clothing in China have gradually developed from the previous differentiation to the trend of convergence. The second is the decoration method: the public's pursuit of practicability and aesthetics of vest clothing deepens, making its decoration method more complicated and complicated, especially for ancient women's vest clothing, which tends to be more aesthetically designed. Vests are seldom made of silk, silk and brocade. They are mainly made of cloth and made of plain colored embroidery. Subsequently, the vest design pays more attention to aesthetic, such as half arm and cover armour, which are both practical and decorative. In ancient times, women liked to set a ribbon strip at the neckline, or use colorful geometric patterns. The half arm is mainly made of brocade material with rich patterns and colors and thick texture, which is not only warm and decorative. The brocade weaving process is complicated, but the technical level of brocade in the Tang Dynasty is relatively high. Various auspicious signs, plants and other patterns are woven with multi-color warp and weft silk, which can highlight the noble and elegant temperament. The Ming Dynasty women's bijia dress usually has a border around the placket, which is not only highly aesthetic, but also reflects the gentle and elegant temperament of women. With the continuous improvement of embroidery and other clothing production technology, the decoration methods of vest clothing are more diversified, which are reflected in the folk or court clothing. It not only promotes the development of vest clothing culture, but also provides a carrier for the innovation and development of decoration methods. A large range of embroidery on vest clothing, with decorative elements such as edging and turnbuckle, makes vest clothing more attractive and has a higher level of technological value, which fully reflects the prosperity of ancient society. The decoration methods of vest clothing are diversified. Besides the materials, embroidery and trim of vest, the shape of vest can also be adjusted to highlight the decoration. For example, the high-necked vest, although the cold-proof effect is strengthened, is less convenient to wear. In order to pursue the psychology of seeking differences and personalized self-expression, women cannot help admiring the high-necked vest. In particular, the combination of various forms of placket and plate buckle and other decorative elements enhances the aesthetic quality of clothing. Third, utility value: Vest clothing can be worn in any season and any occasion, and the utility value will be strengthened, which is also the reason why vest clothing is still accepted by the public. In the initial period of vest clothing design in Qin and Han Dynasties, the utility value of vest was relatively single. The utility value of vest was mainly women's underwear, which played a role of warmth preservation and protection. With the historical evolution, its utility value has gradually developed into a diversified trend. The vest armor is matched with the vest shirt, which not only can prevent the wear of the metal nail on the skin, but also can resist the stab wound of the external sharp instrument. The vest shirt also has the function of keeping out the cold, and the functional value of the vest clothing gradually appears. In particular, half arm and girdle clothes are widely loved by people at all levels, and they are not limited to gender and age. They are necessary clothes for people and dignitaries in daily life. Subsequently, the function of vest becomes more and more diverse, including tuxedo and regular wear. Especially under the influence of the development of modern science and technology, the functional vest is widely used in military and other fields, and its application value is constantly improving.

3. Functional Application of Vest Clothing

3.1 Medical Vest

For example, a composite thoracolumbar fixation vest is mainly used for carrying patients with thoracolumbar fracture and external fixation after thoracolumbar injury surgery. The inner layer is made of flocked vinyl chloride material, the outer layer is made of pure polyvinyl chloride material, the keel structure is made of PC material, the adhesive tape buckle skirt is designed, the length of the strap buckle belt is adjustable, and a plastic valve, an air pressure ball and an air bag are used to form an air bag system. In clinical application, it is not limited by the patient's height, weight and other conditions. The appearance design is beautiful and atmospheric, and it is easy to wear and carry. The main thing is that according to the anatomical and physiological design, it is suitable for external fixation of acute lumbar sprain, lumbar disc herniation and other patients. The advantages in the fixation effect are incomparable between plaster and brace, ensuring the overall effect [1].

3.2 Military Vest

The military vest belongs to a special vest, which is used to carry tactical equipment such as weapons and ammunition. While reducing the weight resistance of the equipment, it is convenient to use at any time, and has a large carrying capacity. For example, the Alice system, like a thick strap and belt, has certain characteristics of camouflage and fitness. At the same time, it can get the ammunition quickly, without loosening or jumping up in the movement. Soldiers have different tasks and vest designs. Aggressive soldiers will carry radios and first aid supplies. In order to cope with the instantaneous situation, flexible removal of equipment should be ensured. Snipers will carry communication equipment and distance cameras and other equipment. Medical personnel will carry weapons and first aid supplies for the mission. In addition, special decorations such as mute buttons will be selected to prevent the equipment from making noises. Compared with the U.S. military vest, the Russian tactical vest is more cumbersome and durable, such as the defender 2 vest, with a respect of more than two kilograms, and the bulletproof inserts and other facilities are more heavy, especially in the hot weather, which directly affects the combat effectiveness. The utility model has the advantages of detachable collar and the like, reducing the damage of shrapnel. With Velcro design, it is more convenient to wear. Equipped with fixed webbing equipped with weapons, it looks like a movable warehouse. German vests are lighter and more unique, such as IDZ SET vests, which can be equipped with grenade bags and glove bags, etc. the webbing material is soft, the installation of the equipment bags is not affected by angles, and the device is more convenient to take out. Tactical vests are used for carrying articles and ammunition while bulletproof vests are used to protect soldiers from shrapnel.

3.3 Power Generation Vest

A generator set is arranged in the interlayer at the back of the vest to generate electric energy according to the temperature difference between the human body and the outside. An electric energy output interface and a storage battery are respectively arranged in the interlayer of the shielding parts on the left and right sides of the vest and are connected with the generator set for storing electric energy. In the absence of external power supply, it can generate electricity through temperature difference, and use electric energy through electric energy output interface, which is more suitable for hikers.

3.4 Power Staff Vest

The power industry is relatively special, and the vest has the functions of self-protection and work needs of employees, such as substation operation inspection wearing vest. The vest body can be flexibly worn, which is composed of chest belt, back belt and belt. It is equipped with multiple hanging buckle and pocket, and can carry walkie talkie and other tools, which is convenient for switching and operation inspection. Vest around the needs of field work design, low material cost and simple structure, more conducive to work efficiency. For example, a refrigeration vest is

suitable for high-temperature outdoor work and consists of a cold storage bag and a ready-to-wear vest. The phase change energy storage material has large latent heat and long phase change time and can meet the cooling requirement. It has the characteristics of appropriate phase transition temperature, economy, portability, thermodynamic feasibility, etc. Phase change material is composed of glycerin, caprylic acid, hexahydrate ferric bromide, etc. it can absorb heat at high temperature, harmless to human body, physiologically reliable and low cost, but requires high packaging measures. In particular, peg600 cold storage material can absorb most of the body heat, maintain at about 20 °C, relatively high comfort, vest weight of about 2.5kg, more convenient to carry.

3.5 Vest of Women

Women's vest includes suit vest, sports and leisure fashion vest, cold-proof vest, professional vest, etc. Among them, professional vest is suitable for photographers, traffic police on duty and other industry roles, with multi-pocket and reflective functions. The shape of vest includes jacket, jacket, suspender, corset and vest, or it can be divided into loose vest and waist vest. The shape and type of vest are different, and there are strict requirements on the composition factors such as length of garment, functional looseness of chest circumference, etc. For example, the shape of the casual vest is similar to that of the suit vest, and the dress is more casual. It can be freely matched with casual clothes and can also be used as a small coat for adjusting seasonal temperature difference. There are many changes to the structure of the vest suit. The cuffs are dug deeper, the shoulder width is relatively narrow, and the length of the garment is longer. The front placket adopts four buttons, and the rear center hem is dug with a small triangle. Most of them are made of leather, wick or cotton [2].

3.6 Reflective Vest

Reflective vests are widely used in construction personnel, express delivery personnel, traffic police and other professions. There are also differences in the colors, styles and fabrics of vests of different professions. Reflective vests have the functions of publicity and warning lights. Reflective strips will shine in the dark, and are suitable for long-term workers. The reflective vest is mainly made of Oxford cloth, mesh cloth, knitted cloth and other fabrics. With the high visibility of reflective materials, it can ensure that the staff can complete the work safely in bad weather or at night, and reduce unnecessary casualties. Therefore, it is also a safety warning product. For example, the reflective vest of sanitation personnel can be improved in safety, with high color recognition, and can be seen in the distance.

3.7 Vest of Male

The current vest is no longer exclusive to gentlemen, and the idea of a three-piece suit has been forgotten, especially the frock vest and skill vest, which are becoming the most popular and hottest items for men. With the development of the times, vests can be used in various fields as labor uniforms in addition to the role of gentry. For example, the tooling vest of fishing vest is similar to the tooling shirt, which can meet the work needs of workers. Compared with the gentleman vest, the material is more rough, and the number of pockets for parts and repair tools is more. The fishing vest was first launched for fishing enthusiasts, and the pocket layout is more convenient for carrying fishing gear, such as detachable small sponge, which can be used to hang fishing hooks. Outdoor fishing vest is made of waxed waterproof canvas. The material is old and popular with frock lovers. It is difficult to distinguish the current frock vest from the fishing vest. After the style innovation, it is almost integrated, especially the pocket design, which is more decorative than the practicality. Although simple, it is rich in retro style. Especially when mixed with a suit shirt, gentlemanly elegance coexists with rough and old feeling. Under the influence of punk and urban style, people are more fond of bulletproof vests or functional vests with chests, and they are also favorite items for runway or street photography. Functional vest refers to tactical vest, which evolved from military uniform and is highly sought after by military fans and functional fans. Functional vests have unique shapes and various types, such as the chest bag evolved from the US Marine Corps

tactical vest. The functional vest features small pockets, black, light weight, chemical fiber or nylon materials, waterproof and abrasion resistance, etc. The detailed design of webbing and buckle, etc. creates a strong sense of future and industry. The design of various parts makes it simple, practical and stylish [3].

4. Conclusion

Based on the analysis of the shape and historical evolution of vest clothing in China, it is found that vest is designed around the concept of sleeveless top. Through the different design of sleeve length and placket, it highlights the changing characteristics of the structure of uniform and the utility value of diversity. From the perspective of its multi-functional application, there are also differences in utility value between the design and application places of various uniforms and functional waistcoats. For example, in the application of professional posts, the utility and comfort of waistcoats are stronger. In the design of daily clothing, all kinds of waistcoats are designed around decoration and aesthetics, which plays a positive reference role in the development of Chinese waistcoat culture.

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