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Research Article

THE METHODS OF WELDING DETAILS OF SEWING ITEMS FROM THERMOPLASTIC MATERIALS

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ABSTRACT

This article describes the types of seams used in the process of manufacturing thermoplastic materials, which can be produced on the basis of new directions in the direction of sewing in the field of the light industry, which is developing year by year in our country.

KEYWORDS

Light industry, special clothing, welding technology, thermal contact, ultrasonic, frequency, film materials, waterproof, polyvinyl chloride coated materials, pressure, temperature, Teflon, synthetic fibre.

INTRODUCTION

Polyvinyl chloride-coated materials are widely used for sewing clothes in sewing enterprises. The basis of these materials is yarn gauze, artificial and synthetic fibre material or knitted canvas, covered with polyvinyl chloride [1-7]. In addition, materials in the form of films are also used. When connecting these materials with thread, the seams do not come out very well and

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become water-permeable. They cannot be glued together, because it is impossible to press them in a hot press. In addition, there is no need for glue, because thermoplastic films and polyvinyl chloride-coated materials themselves have thermoplastic properties. Therefore, the welding method is used to make clothes from these materials [8-11]. By welding, it is possible to create solid seams and decorate some details.

The main part

The development of the product manufacturing industry, the improvement of the assortment type and the expansion of the type of manufactured products will depend on the expansion of synthetic fibre raw materials. At the international level, the balance of chemical fibres is 48.2%, of which polyester, polyamide and polyacrylonitrile synthetic fibres make up 37.3%. The use of synthetic fibres in textile materials leads to the improvement of consumer properties. Synthetic materials are characterized by lightness, beautiful appearance, water resistance and low cost. Plastic, polyvinyl chloride, polyethene and polyamide, film materials are widely used in the development of the top coat and covers [12-19]. They are water-resistant, elastic, soft and cheap. Covering materials are widely used in sewing special clothes, jackets and coats. As a basis for these materials, cotton fibre, artificial fibres and knitted fabrics are used. In the process of threading these textile materials, the strength at the seam line decreases and the gas becomes water-permeable. Therefore, the welding seam is widely used in attaching the details of clothing from the above-mentioned gasifications.

In addition, a welding seam is used to attach clothing details from natural and viscose fibre gauzes and knitted fabrics mixed with a thermoplastic. One of the main properties of synthetic fibres and polymers is their thermoplasticity. To use this property, it is appropriate to use the method of joining clothing details without thread, and welding [20-26].

Welding- this is a technological process of forming a continuous connection by bringing the connected surfaces in the contact zone of the fabric to a sticky state and then attaching them.

Weld -it is the process of bonding thermoplastic materials under the influence of heat and pressure. For such materials, it is not wise to use thread joints, because the sewing process is difficult, and the strength and waterproof properties of the fabric are reduced by threading the products. Due to the fact that the material is thermoplastic, it is also inappropriate to press it with high pressure and glue it.

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Figure 1. Welding methods.

When sewing clothes from film thermoplastic materials (plastic polyvinyl chloride, polyethene, polyamide) is required to use welding. Three types of welding methods are used in sewing enterprises: contact (continuous and thermopulse), high frequency and ultrasonic.

To date, the essence of the electric heating contact welding method in sewing enterprises is that the material is treated with a special heating tool. The heating temperature is 300-350 °C, Teflon of tracing paper is used to prevent sticking [27-30].

In high-frequency current welding, the thermoplastic material is placed between two plates that are heated by high-frequency alternating current. The high-frequency current causes heat dissipation between the plates to move in the electric field of dipole molecules (electrically charged at a certain distance from each other) in the polymers and perform certain work. The material softens under the influence of heat and is welded.

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Figure 2. Clothes processed by welding.

Thermoplastic material is welded very quickly in a high-frequency field. For example, a plastic polyvinyl chloride film with a thickness of 0.15-0.2 mm is welded in 2-3 seconds.

In the ultrasonic welding method, the thermoplastic material is affected by ultrasonic vibration and pressure. A vibrating body absorbs this vibrational energy and turns it into heat. When ultrasonic frequency vibrations pass through the parts touching each other, the material is welded due to the mechanical effect and ripple effect of these vibrations.

Figure 3. Clothes welded with the high-frequency current.

There are 3 different welding methods: heat welding, high-frequency current and ultrasonic welding.

Method 1. The joint of the material is heated and softened in a contact heating device, and then cooled. For this method, the German "Pfaff" company 8300 cl. the car is used. To prevent the film from sticking to the hot tool, cellophane, tracing paper and a thin film of fluoroplastic (Teflon) are placed between them.

Method 2. Welding with high-frequency current [4,18,34].

By welding, it is possible to create joining, laying, folding, and connecting seams:

- butt weld is waterproof and simpler than other welds, this weld is used in areas that do not require curing and are waterproof;
- open-cut fold welding is used in the processing of the edge of the board, the edge

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of the collar, and the bending of the hem and the end of the sleeve;

- Open cut butt weld - used for attaching shoulders, sides, sleeves and other cuts of waterproof clothing;
- Closed butt weld - since it is slightly more mature and beautiful than open butt weld, it is recommended to use it for welding the main details of all materials with thermoplastic coating;
- Butt weld is used in the welding of sub-collar, adip pieces.

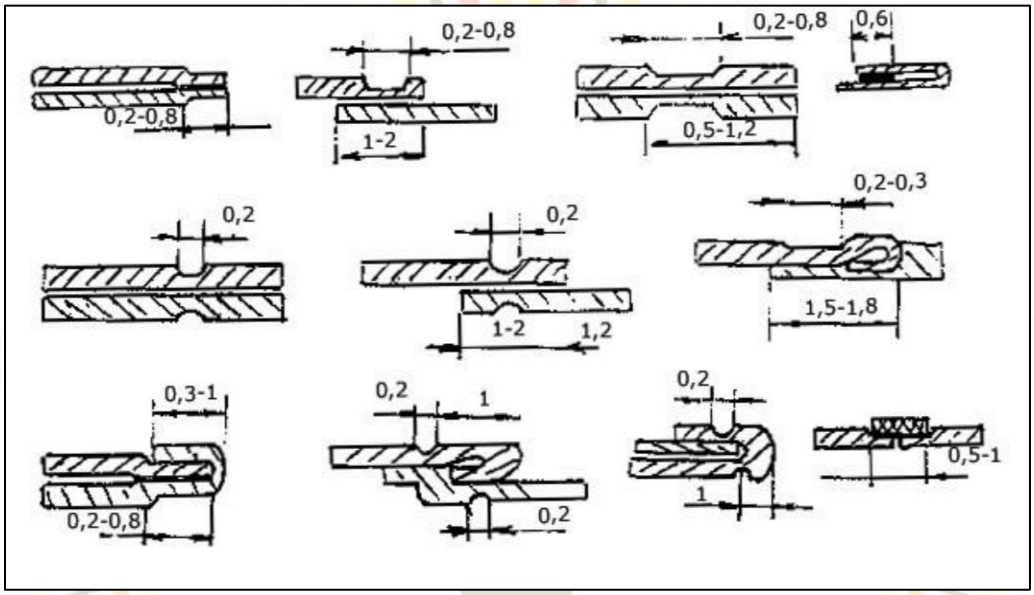

Fig. 4. Schematic diagram of types of welds.

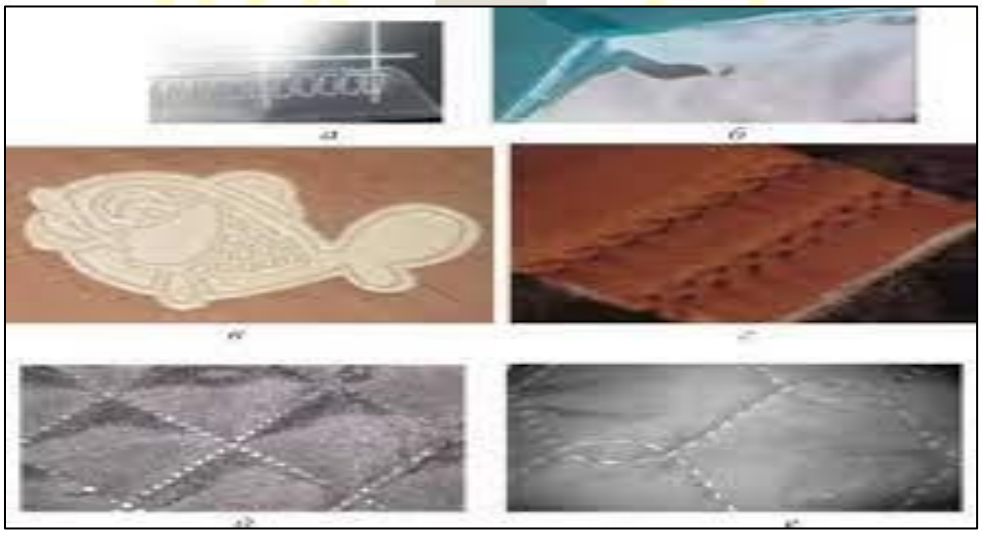

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Figure 5. Examples of types of welding.

Having studied the properties of gas in the methods of welding and threading of items, I can achieve the strength of the seams of the finished item by connecting the seams with thread or welding methods. It is recommended to sew outerwear with the use of machine seams when sewing outerwear. The level of ripeness depends on the density of the gas [5].

CONCLUSION

The use of synthetic fibres in textile materials improves consumption characteristics, lightness, beautiful appearance, water resistance, and low cost of synthetic materials. application of materials. They are water-resistant, elastic, soft and cheap, and covering materials are widely used in sewing special clothes, jackets and coats. Taking into account that the strength of the seam line decreases and gas becomes water-permeable in the process of joining the thread, it is necessary to increase the number of products treated with welding seams and to implement measures to produce them for the domestic market.

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