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ПОДОБРЯВАНЕ КАЧЕСТВОТО НА РЯЗАНЕ НА ТЕКСТИЛНИ МАТЕРИАЛИ

Прибеха Д., Смутко С., Мица В. -Хмелницики Национален Университет, Украйна

IMPROVING THE QUALITY OF CUTTING OF TEXTILE MATERIALS

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Abstract:

« The article presents the results of development cutting equipment of sewing enterprises. The quality of the product is laid already at the stage of cutting the textile materials into parts. At present, the level of development of the technology of clothing manufacturing has increased considerably, based on the experience gained by enterprises on the implementation of scientific developments. Therefore, there was a need for updating and replenishing information on the details of sewing details and developments.

« In the work the analysis of modern technology of cutting materials and modern cutting equipment for the purpose of cutting materials rolls. The construction of a device for transverse cutting of roll materials, which has advantages due to the use of the carriage with the transport mechanism as an additional module of the cutting tape machine, is proposed. In this case, the quality of the cutting process increases, as well as the energy intensity and metal content of the device are reduced.

Keywords: cutting of textile materials, cutting equipment, clothing manufacture, cutting parameters, rolled materials.

INTRODUCTION

The main task at the present stage of the development of a market economy is to increase the production of high-quality goods that are in high demand by the population. To solve this problem, the development of resource-saving technology for the manufacture of products with the use of modern high-performance equipment, as well as the improvement of cutting technology, play a major role.

The high quality of cut is one of the main factors determining the competitiveness of the clothing industry. Important place in solving this problem belongs to the preparatory-cutting production of sewing enterprises, in particular, the processes of cutting materials that determine the quality of manufactured products, their material and complexity. Application of high-performance equipment on the basis of rational methods of processing of sewing products, ensures high efficiency of production of products. Increasing the requirements for the quality of cutting components is also due to the introduction of automated sewing machines, the effectiveness of which is largely determined by the accuracy and cleanliness of parts.

Modern cutting equipment allows you to

download the main workshops, providing the material with the necessary shape and size. Preparation of the fabric occupies an important place, and cutting equipment for sewing production is a complex of various machines and mechanisms.

The quality of the product is laid already at the stage of cutting textile materials into parts and from the total number of defects in the product a significant percentage arises due to inaccurate cutting. The decomposition of textile materials is associated with a number of difficulties and disadvantages, which consist in the rapid blunting of the cutting tool, in a significant amount of the defect along the line of the cut of the part due to the relative displacement of the layers and the deviation of the belt knife at the turns, the size of the cutting part and the vibration of the belt knife, the amplitude of which can reach 6-8 mm. Improvement of accuracy can be achieved by optimizing cutting parameters and improving the design of cutting equipment.

EXPOSITION

Recently, due to the appearance of a wide range of new materials with different fibrous composition

and properties, more and more attention is paid to improving the methods of cutting out the details of clothing. Widespread equipment has been acquired for performing non-typical operations, which improves the working conditions and production culture.

At present, the level of development of the technology of clothing manufacturing has increased considerably, based on the experience gained by enterprises on the implementation of scientific developments. Therefore, there was a need for updating and updating information on cutting details of sewing products.

The analysis of scientific and technical literature, patent materials, exhibitions of international exhibitions of a sectoral nature, as well as the study of the practical state of affairs for the creation of modern samples of technological equipment for the implementation of the cutting process, indicates their limited number.

The purpose of this work is to improve the process of cutting the roll materials, aimed at achieving the exact cut, reducing the material and the complexity of product manufacturing by improving the design of the stationary cutting tape machine (SRLM).

Based on the goal, the following tasks should be solved:

- to carry out the analysis of the modern technology of cutting the material;
- to carry out the analysis of modern cutting equipment for the purpose of cutting rolls of material;
- to propose the construction of a device for the transverse cutting of roll materials.

A wide variety of types of clothing, materials, from which it is made, constructive and technological solutions taking into account individual characteristics of man lead to the need to create flexible technological industries. However, the current economic situation of light industry does not always correspond to the possibilities of implementing flexibility in organizational and technical solutions.

Along with the development of innovative materials, new low-operational and low-waste technologies of forming and processing of parts cut from traditional materials are created.

Technological processes of systems and material service objects represent a complex complex of interactions of tools with the processed material, which leads to the receipt of the finished product. In this case, there are certain conditions in which the technological process operates - production conditions or restrictions [1].

Functioning of technological processes as a system within the production is to continuously implement the function of the process - the manufacture of products

from cutting parts.

Technological processes of clothing manufacturing, which are used in single, serial and mass production, have distinctive features.

Technological processes of unit production, characteristic of service enterprises that make clothes for the individual consumer, are characterized by concentration and execution of operations in one workplace. Technological processes of serial production are characterized by the rhythm of operations, the location of equipment most often by types of processing. Technological processes of mass production are characterized by strict rhythm of execution of all operations, using special equipment.

The enterprises of the fashion industry are still using outdated technological equipment while the simultaneous emergence of modern multifunctional, computerized equipment, partly integrated into modern information technology in the field of service provision [2].

Mechanization and automation of clothing manufacturing processes in the garment industry are carried out in different directions. The choice of direction, its development and wide application in the practice of sewing production largely depend on the overall level of scientific and technological progress, not only in clothing, but also in related industries of the national economy, the state of clothing technology, materials used, as well as the level of development of a number of prerequisites necessary for implementation of mechanization and automation of sewing production.

One of the main areas of mechanization of sewing processes is to increase the level of technical equipment of the industry - the introduction of modern machines, equipment for wet and heat treatment, small mechanization facilities, and the replacement of manual operations by machines [3].

Nevertheless, an important aspect of mechanization and automation of the processes of making clothes is the improvement of the design of the details of the garment, corresponding to its finishing.

At present, fashion and style are largely based on details, on fittings and decorative materials, additions and decorations. The decoration, made directly in the manufacture of products in garment shops, has a great influence on the quality of clothing and its competitiveness. Operations for the processing of sewing products are included in the technological process or designed as an independent technological process at the enterprises of the service sector.

The type and quality of processing are largely determined by the implementation of modern clothing

of its aesthetic functions and the use of equipment for this processing. Proper and successful use of processing not only clarifies the purpose of clothing, but also ensures its individuality, as well as in some cases allows you to emphasize the merits and hide the imperfections of the figure. Today, the buyer is willing to pay more for the originality and quality of garments, and therefore the rate for using different types of processing is win-win. At the same time, a significant number of decorating materials is presented as a ribbon.

Improvement of the processes of manufacture of sewing products by wide application in the manufacture of various parts and knots of garments machines equipped with devices for roll feed, which allow to sharply reduce unproductive costs for the implementation of auxiliary and additional operations. At present, roll presentation is widely used in the treatment of sacking (substrate) of internal pockets, belts of pants and skirts, bottom of pants, collars in women's light clothing, side skirts, aprons and other aprons.

When rolled, the parts are supplied from the roll to the working area, processed and usually withdrawn from the zone in the form of rolls or tape. Thus, an opportunity to avoid the capture of each detail, the introduction of it in the guiding device and the removal of the workpiece. It is enough to perform these operations with the first part of the roll. When quasirulling is required, an additional operation is required - the formation of a roll of cut parts, the subsequent operations do not differ from the rolled version. With rolled and quasiluminous filing conditions are provided for the most complete use of speed of the machine, since the machine time is practically equal to the total time of the operation, that is, it is achieved overlapping machine time in the time of the implementation of auxiliary techniques. When roll-loading-unloading of semi-finished products, the idle time value decreases dramatically, which, along with a significant increase in productivity in rolled view, provides exceptionally favorable conditions for automation of processing and assembly of parts. There is no need to create complex units of single-piece delivery, simplify the methods of orientation of parts in the working area, mechanisms for removing parts from the working zone [4].

The method of rolled loading of the equipment with all its positive qualities has a significant drawback - the area of its application is small due to different shades of the processed material. Basically, it can be used to make decorative elements of contrasting fabrics and

parts of fabrics without significant shades. It is also promising to apply this method for the manufacture of products consisting of one part, for example, bed linen.

It is worth emphasizing another advantage of roll feed - reducing the time on cutting details. However, the widespread use of roll representation encounters a number of difficulties. For example, in some cases, different shades of parts assembled in a roll, and other parts of the product are not allowed. It is also undesirable to increase the cost of the fabric (parts supplied from the roll must be excluded from the layout and cut separately), etc.

However, the described approach can be used in cases where the difference in shades is insignificant or insignificant for the appearance of the product.

When choosing the layout of the product, you should use the processing of the upper edges and the bottom of the pants and skirts in the expanded contour. When treating men's pants, it is advisable to apply rolls of semi-finished products. When processing the upper sections of the trousers from the roll can be fed belts, braids, clamps, and when processing the lower sections - a braid. In other cases, it is necessary to first cut piecewise parts to roll, and then serve from this roll.

Several types of cutting equipment are used in the garment industry, namely: mobile, stationary with ribbon knives and automated cutting complexes. The aforementioned cutting equipment, as a rule, is used to cut the floorings of the fabric. This equipment is not used to obtain roll cooking.

Analysis of information sources showed the lack of materials describing how to cut the roll materials with the specified parameters of the width of the tape. Therefore, the authors of this article have proposed a classification of methods for cutting roll materials (Fig. 1) on the following features:

- cutting of roll materials in the process of roll rewind;
- direct cutting of roll materials.

Direct cutting of roll materials can be made as a result of the roll of the knife, or cutting the roll with the movement of the knife on the roll. In this case, the roll can rotate or be stationary.

There are devices that are intended for the transverse cutting of a roll of material [4, 5], which are stand-alone structures, including material feed mechanism and cutting mechanism. In the mechanisms of cutting, as a rule, apply lamellar knives, which are moving reciprocatingly, perpendicular to the movement of the material, or rigidly fixed. The disadvantages of these devices are high metal capacity and energy intensity and poor quality of material cut due to the use of a plate blade.

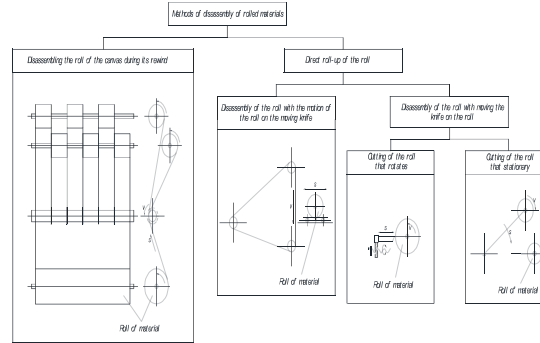


Fig. 1. Classification of methods of cutting roll materials

In order to improve the cutting quality and reduce energy intensity and metal content, a construction of a device for transverse cutting of roll materials is proposed, which can be applied in conjunction with existing stationary cutting tape machines [6,7]. The task is achieved by the fact that the device consists of a carriage into which the roll of material and the mechanism of its transportation are put. The device is characterized in that the cutting of the roll on the bobbin is performed by a belt knife, with the carriage, carriage carriage and position sensors mounted on the tabletop of the tape machine.

The device for transverse cutting of the roll material is shown in fig. 2

The device for transversal cutting of roll materials consists of a carriage 1, a carriage transport mechanism 2, position sensors 3, a stepper motor 4, latches 5 and 6, a guide plate 7, transport rollers 8, a locking plate 9. The device is fixed on the table of the cutting tape machine 10.

The carriage 3 is moved by means of transport rollers 8 on a special guide plate 7 which is pre-mounted on the tabletop of the tape machine 10 in place of the protective plate perpendicular to the plane of the movement of the ribbon knife. The carriage 3 is driven by the mechanism of transportation 2, which is a gear-to-pass transmission. The toothed pass is rigidly connected to the carriage case with the fixing plate 9. The carriage transport mechanism is secured to the tape machine countertop along the guide plate 7 using latches 5 and 6. The latch 5 is made to adjust the tension of the belt.

The device works as follows. The pre-pressed roll of

the material is inserted into the groove of the carriage, while its one edge should extend beyond the carriage in the cutting area by a value equal to the width of the bobbin to be cut off. When the stepper motor 4 is turned on, a quick movement of the carriage 1 moves on the cutting unit than the cutting machine. When reaching the carriage of the left sensor position 3, the location of which depends on the thickness of the roll, the speed of motion decreases and there is a cutting process. When the carriage reaches the right position sensor 3, the carriage stop is followed by a subsequent reverse and stop in the initial position. The cut off part is removed, and the roll is shifted to the restricting plate. Then the cycle repeats itself.

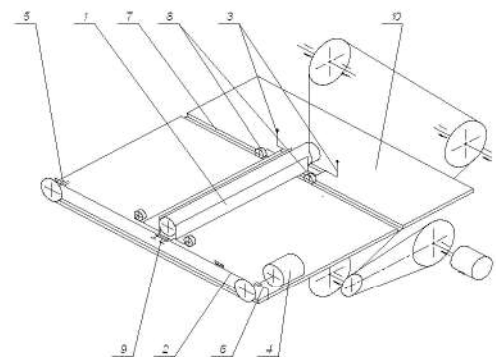


Fig. 1. Device for transverse cutting of roll materials

CONCLUSION

The comparative analysis of the prototype installation shows that the proposed device for transverse cutting of roll materials has advantages due to the use of the carriage with the transport mechanism as an additional module of the cutting tape, while improving the quality of the cutting process, as well as reducing the energy and metal capacity of the device

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