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Form-Resistant Combined Knited Fabric

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ABSTRACT

The paper is devoted to the method proposed for the production of inlay fleecy knitwear on the basis of the plane stitch, where the fleecy thread placed along the stitch row and fastened to the ground due to forming from loops at least through three loop stitches.

KEYWORDS

Knitting, Form Resistant, Fleecy, Inlay, Combined Stitch.

INTRODUCTION

Expanding the assortment, improving the quality of products are the most important factors in the formation of the competitiveness of goods. Knitwear technology allows you to combine elements of various weaves in one fabric, which makes it possible to set the required parameters and properties of the knitted fabric. In order to expand the range of knitted fabrics for the manufacture of products with high heat-shielding properties, a study was made of ways to increase the efficiency of the production process and improve the quality of fleecy inlay knitwear.In the conditions of the actively developing integration of science and production, when scientific developments are aimed at improving product quality and increasing production efficiency, it is especially important to develop new types of knitwear with high consumer properties and methods of their production that can be introduced into knitted production enterprises without additional costs and reconstruction of the existing equipment. The results of the analysis of the assortment of enterprises showed that the assortment of the produced outer knitwear, especially for demi-season purposes, is very limited.

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For the manufacture of outerwear (jumper, cardigan, coat, etc.), knitwear must have a set of certain quality characteristics, and, first of all, form stability. In addition, the obligatory quality indicators of knitted fabrics intended for upper garments are surface density, breaking load, abrasion resistance and appearance.

Studies have established [1-2] that the following factors have a significant effect on the dimensional stability of knitwear:

- The mechanical properties of the threads, namely the elasticity of the thread;
- Jersey structure;
- General stretch of knitwear;
- Loop module.

MATERIALS AND METHODS

The indicators of the form stability of knitwear under mechanical loads are greatly influenced by the general extensibility of knitwear [3-5]. As a rule, knitwear with more stretchable (having a lower degree of thread orientation in the loop) stitches have a large proportion of slowly reversible deformations and, as a result, less dimensional stability. This is due to the fact that knitwear with less oriented (more stretchable) stitches, when stretched, there are deeper changes in the inter-loop ties, the points of contact of the threads receive large displacements, while the total friction path of the threads increases, the threads are pulled from one , less tense, into other, more tense, sections of the loops and, as a result, deeper changes in the structure of the knitwear, which are restored more slowly.

Consequently, one of the necessary conditions for increasing the dimensional stability of knitwear is a decrease in its extensibility, which is achieved by introducing elements highly oriented in the direction of stretching into the structure of knitwear, for example, broaches, sections of threads that are not knitted into loops, etc.

As a result of the analysis of existing methods for increasing the dimensional stability of knitwear, it was found that a decrease in the extensibility of knitwear along the length is achieved by including in the structure of knitwear:

- Elongated jacquard loops;
- Press sketches;
- Longitudinal laidthreads.

The main role in the formation of the dimensional stability of knitted fabrics, as the most important property that affects the conditions for cutting, sewing and operation of products, is played by the type of weave and the fibrous composition of the yarn used. At the same time, an important task is to increase the dimensional stability of knitwear without increasing its material consumption. When creating form-stable weaves with a stable structure, it is necessary to introduce additional elements with low extensibility into the main weave and to increase the number of points of contact between the threads in the loops to increase the friction forces between them.

The best known methods for increasing the dimensional stability of knitwear are the inclusion of elements of press, jacquard, incomplete and other weaves in the structure of knitwear; the inclusion of additional threads in the knitted fabric structure; the use of synthetic raw materials.

Fleecy knitwear is widely used in the manufacture of knitwear with high heat-shielding properties. As you know, the fleecy thread is not knitted in the ground of knitwear,

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which reduces the degree of its fixation. For a number of products, this is not of fundamental importance, however, for products subject to high tensile and abrasion loads, the fragile fixing of the fleecy thread in the ground of the knitted fabric contributes to rapid wear. In the manufacture of products with increased dimensional stability and high heat-shielding properties, a inlay thread is included in the knitted fabric structure. With the aim of increasing the strength of fixing the fleecy yarn in the ground of knitted fabric and increasing the dimensional stability, a structure and method for producing inlay fleecy knitwear have been developed.

A known method of knitting shape-stable jersey knitwear [6].

The jersey contains a soil formed by looped rows of full and incomplete weft plain. The loop sticks of the loops of the incomplete surface are diametrically turned relative to the loops of the surface. The inlay threads are located in front of the loop frames on the seamy side. The broaches of the fleecy threads are bent in the longitudinal direction and secured by the broaches of the loops of the incomplete plain.

The disadvantage of the proposed method for the production of shape-stable jersey knitwear is that the resulting knitwear is not of high quality, with a weak fixing of the fleecy thread in the ground of the knitted fabric and has a low dimensional stability.

The task of the development is to create a method for the production of form-stable jersey with a strong fixing of the fleecy thread in the ground.The problem is solved by the fact that in the method of producing fleecy weave knitwear on the basis of the surface, including knitting the stitches of the plain, laying the fleecy and inlay threads, fixing the fleecy thread in the plain is carried out by knitting the fleecy thread into a loop in each sixth in the next row, one looped wale now to the right, then to the left, and the transverse inlay threads are fixed with the loop sticks of the ground loops and the loop sticks of the loops and broaches of the fleecy thread [7].

In fig. 1 shows the structure of the form-stable jersey knitwear.

The resulting jersey consists of loops 1 formed from a fleecy thread b1 and ground loops 2 formed from a ground thread a (Fig. 1). Footer thread b1 is tied into loop 1 in every sixth looped wale with an offset of one looped wale to the right and then to the left.

The inlay thread b2 is located along the loop row and is fixed between the loop sticks of the ground loops and the loop sticks of the loops and broaches 3 of the fleecy thread b1.

In this knitted fabric, the stretchability of the knitted fabric in width is reduced due to the introduction of the inlay thread into the knitted fabric structure, and the section of the fleecy thread 3, which connects the loops of the fleecy thread with the fleecy sketches, reduces the stretchability of the knitted fabric along the length.

The formation of loops 1 of the fleecy thread on some needles contributes to an increase in the strength of the fastening of the fleecy thread in the ground. The knitwear of the offered weave has a high dimensional stability and high heat-shielding properties.

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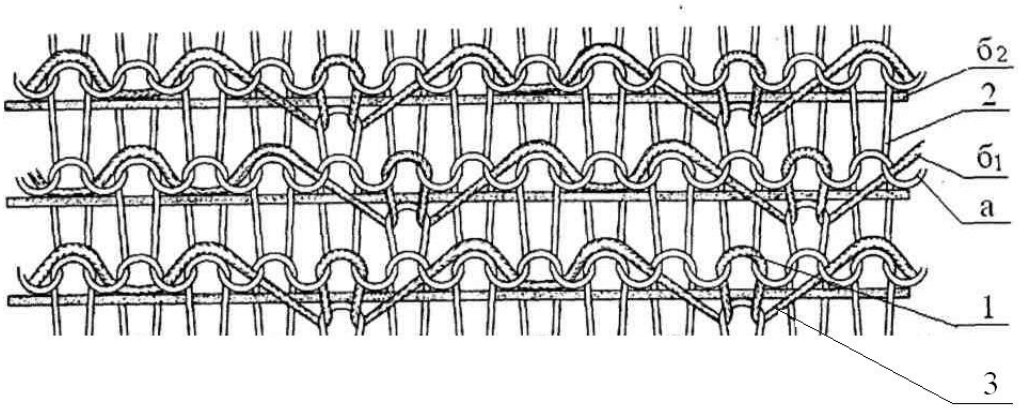

Fig. 1. Inlay fleecy knit structure

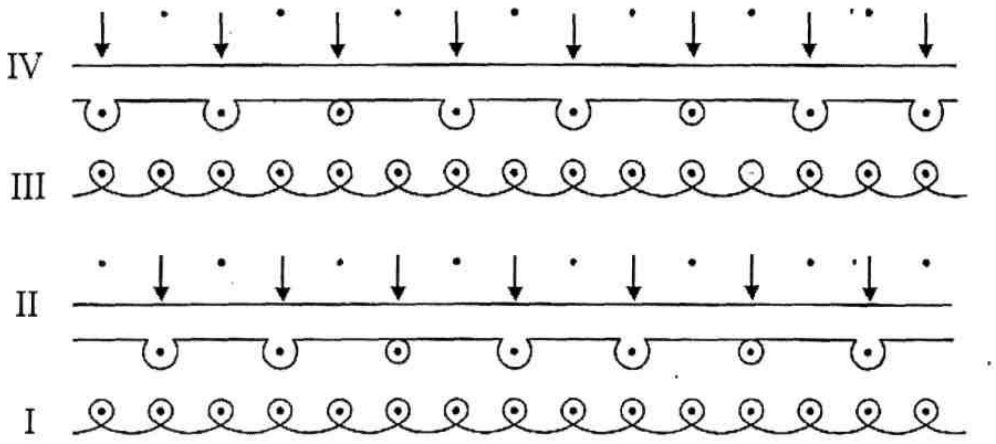

Fig. 2. Graphic notation of inlay fleecy knitwear

CONCLUSION

The method is simple to implement, does not require any changes in the design of the machine. To produce this jersey, it is enough to install additional yarn guides on the machine for laying fleecy and inlay yarns.

Due to the simplicity of the proposed method, the productivity of the machine practically does not decrease, the technological capabilities of the circular machine are expanded due to the production of a fleecy knitwear.

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