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NEW PRODUCING WAY FOR KNITTED FABRIC WITH HIGH HEAT SHIELDING PROPERT

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ABSTRACT

The article is devoted to the development of a method for increasing the heat shielding property of knitwear. The goal achieved due to presence of laid and fleece threads in the developed structure of knitwear. Besides this way allows obtaining double-sided colored knitted fabric. This effect is present on both sides of the knitted fabric, as the indexes of the laid thread outline on both sides of the jersey are the same.

KEYWORDS: *Knitted Fabric, Laid Thread, Fleecy Thread, Heat Shielding Property, Double Knitted Machine.*

INTRODUCTION

Knitted fabrics are formed by knitting threads. The loop is the main link in the structure of the fabric, its ability to change shape and size in all directions provides extensibility - this is how knitted materials differ from all others. Knitwear is a material with amazing properties: it warms in the cold and cools in the heat.

Due to the loop structure, air circulates, which is why it is so pleasant to the body - in the summer it is heat, the skin breathes, in winter, knitwear protects the body from heat exchange with cold air.

Currently, there is a boom in the use of knitted fabrics in almost all areas of human life: in technology, medicine (development of new synthetic knitted materials to restore the anatomical forms and functions of human internal organs), construction, auto and aircraft construction, shipbuilding, rocket and space technology, geotextile and many others.

New methods of processing in the technological process expand the field of application of knitwear. It has become widely used for the manufacture of protective materials in industry, work wear items, for example, knitted gloves with a special coating. Nylon threads increase

strength, wear resistance, due to the looped structure, the back of the hand is ventilated, which ensures comfort when working for a long time, and the latex coating on the palm side and fingers increases adhesion, tear and abrasion resistance when interacting with an aggressive environment, construction materials. These gloves are great for auto repair, construction, handling. It is equally convenient to lay metal roofing tiles in them and to work in the garden.

MATERIALS AND METHODS

The development of knitwear production is due to the increasing demand for knitwear every day, since they are hygienic, have a beautiful appearance, as well as high performance characteristics. To expand the range of knitted outerwear, as well as improve the quality of manufactured knitwear, it is necessary to use new types of raw materials, apply new structures and methods of producing knitwear with improved hygienic properties, high dimensional stability [1-4]. In the conditions of the actively developing integration of science and industry, 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 equipment. One of the most widely used weaves in the production of knitwear is lined.

Known double inlay jersey [4], obtained on the basis of rib stitch. This jersey contains a ground thread, the tucks of which in all the loop wales have been knitted together with the old ones on the new ones. In this case, the laid thread is fixed in the ground by platinum broaches of one row of ground knitwear.

The disadvantages of this knitted fabric are the low degree of fixing of the laid thread in the structure of the knitted fabric, as well as the complexity of the process of its production. In work [5], a method is proposed, where double knitted fabric of inlay stitches contains plain loops formed by incomplete rib stitch and broaches of a laid thread, while the laid thread is fixed in the ground by platinum broaches of loops of several rows of ground knitwear. In the proposed method for the production of lined knitwear, a lining thread, laid on half of the needles of both needle beds, makes it possible to obtain double-sided colored cells on the fabric. This effect is located on both sides of the jersey, as the indexes of the lining thread outline on both sides of the jersey are the same. This makes it possible to reduce material consumption, increase air permeability and improve the hygienic properties of the double lined fabric. Since the laid thread wraps around a large number of ground loop broaches, the degree of its fixation in the structure increases. Broaches, located along the looped wales in several looped rows, reduces the stretch of the knitted fabric along the length. The disadvantage of this method for the production of inlay knitwear is that the large extensibility of the knitwear in width reduces its dimensional stability. In this research work a method for the production of knitted fabrics with a reduced elasticity in width and an increase in its dimensional stability, and also heat shielding properties was developed.

The problem is solved by the fact that the double knitted fabric of inlay stitch contains plain loops formed by an incomplete rib stitch and tucks of a laid thread, while the laid thread is fixed in the ground by broaches of loops of several rows of ground knitwear, the knitted fabric in each rib row contains a laid thread, which located between the loops of the needles of the cylinder and disk [6].

In fig. 1 shows the developed structure of form-stable knitwear, and fig. 2 - the process of obtaining it on a circle double knitting machine. As can be seen from Fig. 1, jersey is knitted on the basis of rib stitch. The ground for knitwear is produced from thread G. The front loops of knitwear with purl loops are connected by broaches Pr. The front N1 and the purl N2 tucks from the laid thread F, laid in the first row, are fastened in the knitted fabric with the tuck broaches. In this case, the lining thread is fixed in the ground by broaches of loops of several rows of ground knitwear. The inserted U laid is between the knit and purl stitches of each row of the rib and the broaches. Form-resistant knitwear on a double knitting machine is produced as follows (Fig. 2). The machine uses an interlock arrangement of needles. In the first system, the lining thread is inserted on half of the needles of the first and second beds, that is, on needles 2, 3. In the second, third and fourth systems, the second half of the needles of both beds, that is, needles 1, 4, etc., knit an elastic row (II, III and IV rows).

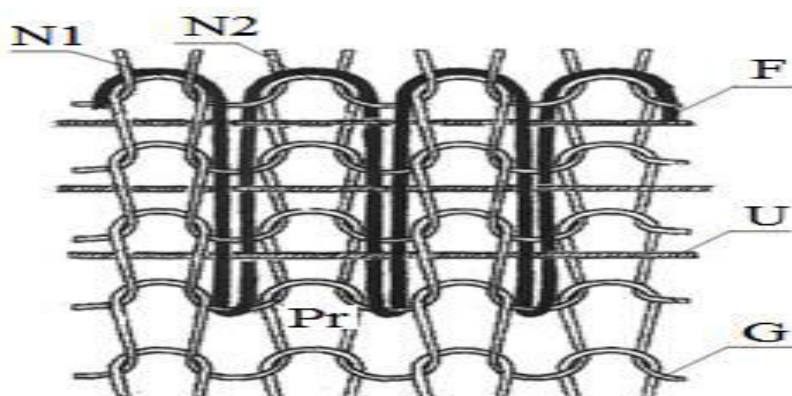


Fig 1. Structure of fleecy-inlay knitwear

In these systems, a laid thread U is inserted between the needles of the cylinder and the disc using an additional thread guide. Broaches Pr, which connect the front loops with the purl loops of the rib, are located between the tucks N1 and N2 of the laid thread F. In the fifth system, the tucks N1, located on the needle of the cylinder 3, is transferred to the purl loop located on the needle of the disc 4. Accordingly, the purl N2, located on the needle of the disc 2, is transferred to the front loop located on the needle of the cylinder 1.

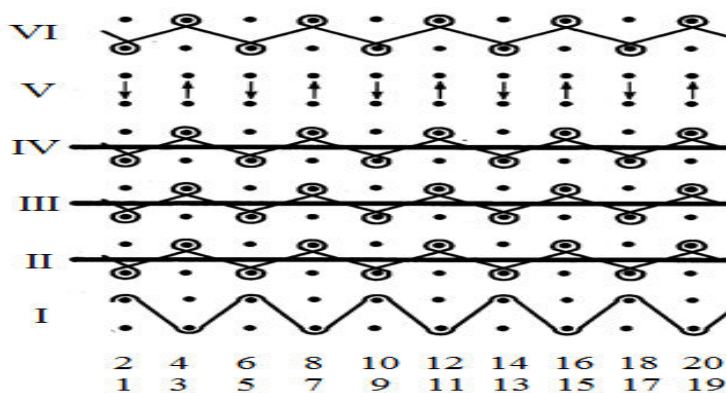


Fig. 2. Graphical record of the process of obtaining fleecy inlay knitwear

In the sixth system (VI-loop row), the needles of the cylinder 1, 3, 5, etc. and disc needles 2, 4, 6, etc. knit an elastic row consisting of front and back loops. In this system, drafts H1 and H2 are dropped onto the Stretch weave broaches.

The presence in the knitted fabric structure of a lining thread, laid on half of the needles of both beds and connected to the ground weave of the jersey, worked out on the other half of the needles of both beds, and a weft thread inserted between the needles of the cylinder and the disk and located along the loop row reduce the extensibility of the jersey in length and width, therefore, the dimensional stability of the knitted fabric is increased. Six loop-forming systems are required to form one repeat. To produce this knitted fabric, it is enough to install additional yarn guides for laying the laid and fleecy yarns. Due to the development of fleecy-inlay knitwear of the proposed structure, the technological capabilities of the circular double knitting machine are expanded.

The presence of laid and fleecy threads in the structure of knitted fabric allows to obtain double-sided colored cells on the fabric. This effect is located on both sides of the jersey, as the indexes of the lining thread outline on both sides of the jersey are the same. The resulting jersey can be successfully used for knitwear of the upper and children's assortment.

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