Topic № 2
TEXTILE TECHNOLOGIES: SPINNING, WEAVING AND KNITTING


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ПРОФЕСИОНАЛНА ГИМНАЗИЯ ПО ТЕКСТИЛ И ОБЛЕКЛО
ДОБРИ ЖЕЛЯЗКОВ

EVOLUTION OF KNITTED MACHINES

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ABSTRACT

The development of knitting machines goes hand in hand with the implementation and use by humans of various knitting structures. As the knitting technique develops, it becomes more productive and allows knitting of more complex structures. Production becomes more flexible, and for a very short time, it passes from producing one item to another.

The beginning of the knitting machine was given in 1589 from William Li. His machine knits with spring-bearded needles with a productivity of about 100 loop rows per minute. In hand knitting, the productivity is barely 120-150 stitches per minute. Today's circular knitting machines fitted with a large number of knitting systems (for example 50) and moving at a speed of 20 rpm may be up to 2000000 stitches per minute, depending on the number of needles in the cylinder. If we go back 20 years, the maximum production of a knitting machine was 300 Kg per day, and today it reaches 1500 Kg per day.

This is why the actual study represents the overall development of knitting machines and modern innovations in this field. The most important discoveries in the development of knitting machines are given in tabular form, including those earlier in the centuries after 1589, as well as recent achievements.

Throughout the development, the main goal was to increase the productivity of the machines and the ability to knit as much as possible a variety of knitted structures.

In tabular form is given the time and place of the various discoveries in the development of knitting technique. The name of the discoverer is also given. Other authors also made such a presentation of the history of the knitting machine. In the present work, the information is broader and up-to-date.

From the analysis of the evolution of the knitting machine, it is also noticed that by adding additional accessories to existing knitting machines, it is intended to apply different techniques to the shaping of knitting. This, however, at this stage leads to the complication and cost of knitting machines without substantial production becoming more efficient. On the contrary, productivity is declining significantly. This means that science and technology still fail to effectively apply these techniques to industrial production.

In this connection, new solutions must be sought. It is necessary to change the basic philosophy of knitting. New loop-forming methods must be sought to provide free space knitting, organs to intertwine the threads effectively and form the bulk shapes of the human figure. It is wrong to go for this purpose from the existing knitting machines that have already played their part and were mainly designed for knitting knitwear. For the production of 3-D knits (whole garments), all-new robotic knitting machines are needed. It has to be assumed that traditional knitting with knitting needles is at the end and looking for alternatives to knitting needles (water or air jet, etc.). The loop-forming element must be variable in size, receive variable velocity and trajectory in the space. Being able to act in the area of a loop, a group of loops or the whole bunch of loops.

Another prospect for knitters' manufacturers to be involved is a flow robotic line that provides a complete knitting of knit garments. This prospect preserves traditional knitting techniques and technologies and provides effective knitting of whole garments. Separate pieces are knit from various knitting machines in a line, and finally they are knit together to form the finished article.

Keywords: Knitting Machine, Evolution, History

UDC677

EXPERIMENTAL STUDY OF THE FRACTION COEFFICIENT OF SLIDING FOR COTTON TEXTILE GARMENTS

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Abstract

1. Introduction

In this hereby study; friction coefficients of sliding of twill wave 3/1 and plain weave have been determined experimentally. In the process of cutting and sewing, friction has an effect on the quality of the finished product due to the non-displacement of the layers of fabrics [1, 2]. The hereby study focuses on the correlation between load applied to the friction and the increasing actual contact area of friction surfaces.

2. Experimental part

The hereby tests have been ran using the MXD-02 Coefficient of Friction Tester, produced by Labthink, China, and by standard BDS EN ISO 8295:2006. The friction study is conducted fabric to fabric, in different directions of the fabric, on the face side of the two layers, with different loading of the tester's sleeve - 200, 300 and 400 gr and with a constant slide speed of 100 mm / min.

The studies fabrics are twill weave 3/1 and linden weave cotton woven fabrics, which differ in linear density, concentration and specific surface area.

3. Results and a Discussion

The conducted research shows the effect of the pressure on the friction characteristics of fabrics of the same composition but with different thickness of the warp and weft threads. The different values of the friction characteristics depend on the change in the contact area, which varies in different directions. The actual contact area increases as the pressure increases, resulting in an increase in friction coefficient of sliding. The friction coefficient of sliding is highest in twill weave 3/1 and for plain weave; it is in warp direction for the first layer and in the direction of the weft for the second layer. This is due to an increase in the actual contact area for the two layers [5].

4. Conclusion

The results obtained through these studies can be characterised as scientifically applicable. They can be applied in power sizing of textile machines. The results obtained can be used when tuning sewing, cutting, etc. machines, used in the textile industry when working with cotton fabrics, as the main purpose is avoid displacement of individual layers during work. In addition, the results can be used to determine the friction characteristics of fabrics - friction factor, friction index, and friction parameter.

Keywords: friction, cotton fabrics, drag coefficient of drag.

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INITIAL ANALYSIS OF HAND-WOVEN SAMPLES OF BROAD CLOTH AND FRIEZE

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For a long time, from the beginning of the 19th to the mid-20th century, two woollen woven fabrics are the backbone of the textile production in Bulgaria. These are the broad cloth and the frieze, which are roughly the same in terms of home crafts, municipal manufactory and industrial weaving. Both articles are made from local wool raw materials on the woollen or carded system of spinning.

The differences between the broad cloth and the frieze begin with their purpose. Broad cloths have a surface weight of 250 to 400 g/m^2 and are designed for upper ladies and men's garments: low-cut sleeveless dress, suits and military uniforms. Friezes have a surface weight of 600 to 1000 g/m^2 and are designed for men's outerwear: cloaks, mantles, ears and great coats.

Substantial divergences between the two fabrics are due to the qualities of the wool raw materials used, the linear density of the weaving yarns and the finishing treatment of the raw fabrics. Woollen yarns for broad cloths have a linear density of about 70-75 tex, while yarns for friezes cover a significantly larger range from 200 to 500 tex. Usual weave for both fabrics is plain weave, but samples of twill are found - 2/1, 3/1, and 2/2.

Divergences in the construction, appearance and consumers properties of the broad cloth and the frieze are mainly due to the finishing of the raw fabric. As long as the broad cloth is washed and pressed in addition to washing, the frieze is subjected to intense and prolonged tightening.

The main problem for the preservation and reproduction of these authentic Bulgarian craft fabrics in their original form is the lack of in-depth research and technological documentation on the conditions of their manufacturing. Subject of this paper is the parameters of the fibre composition, construction and consumer properties of the broad cloth and the frieze. Aim of the development is to establish the technical conditions for the production of the known modifications of the broad cloth and the frieze. Performance tasks include literary research, collection of samples of domestic or industrial origin, analysis of the fabrics and compilation of technological documentation.

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Keywords: textile craft, broad cloth, frieze, woollen yarns.

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ARTISTIC DESIGN AND PRODUCTION OF JACQUARD EMBLEM

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Introduction

The jacquard emblem, as a final product, is originally formed as an idea, design or sketch by the textile artist - designer.

Jacquard weave is a complex process requiring technical knowledge and creative skills. Knowledge of color skience, color harmony and ornamental composition is required.The textile artist must know the laws of interwoven thread, fabrication of tissues structure, composition and type of yarns.

Purpose of the study - Following the steps in the artistic design of the jacquard threat.

Automated design with CAD system and fabrication of the jacquard embem - Coat of Arms of the Republic of Bulgaria, the artwork of which has been produced through the softwer product MUCAD - Passementerie, ISKRA LTD, Parvomay town.

Experimental part

Jacquard lancet tissue is a single tissue on which is placed a second system of basic or weft threads, called lancets, that float on the packed side of the fabric and go out on the face according to the figure. Teh fabric has a weighted view on both sides. The base is hardly visible. Her density is less than weft.

Keywords: jacquard, artistic layout, Emblem of Republic of Bulgaria, insignia.

Conclusion

The analysis confirms the correctness of tne methodology, used to design the fabrics. In conclusion, the present wor can be successfully used to design new assortments of jacquard fabrics.

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