RESEARCH OF THE PRODUCTION OF TWO-LAYER TOP KNOCKEDGES OF A NEW STRUCTURE

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Annotation. *In this article, the development of two-layer knitted fabrics of a new structure for outer knitted products and methods for controlling their properties are investigated. The influence of structural elements, types of yarns, and weave methods of two-layer fabrics on physical and mechanical indicators is analyzed. As a result of the research, effective knitted structures with reduced raw material consumption and high performance characteristics will be developed.*

Keywords: *double-layered knitwear, upper knitwear, blended weave, patterned weave, deformation, yarn composition, structural analysis.*

Log in. Currently, in the light industry, especially in the production of knitted products, the demand for high-quality, functionally and economically efficient fabrics is increasing. Fabrics intended for outer knitted products must have high heat retention capacity, be resistant to deformation, have an aesthetic appearance, and the consumption of raw materials should be economically efficient. From this point of view, two-layer knitted fabrics are of great importance. They have better thermal insulation, strength, and shape retention properties compared to single-layer fabrics.

Main Part. Two-layer knitted fabric is a structure consisting of two independent or partially connected layers simultaneously. These layers are

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formed by the following methods: using a system of parallel needles, a combination of different threads, and the addition of patterned weave elements.

The development of two-layered upper knitwear of a new structure is of great importance in the development of the light industry, and high-quality and functional knitted products can be produced by optimizing structural elements, scientifically selecting yarn parameters and fiber composition, and improving technological processes.

Among the imported knitted fabrics, a sample of knitted fabric made from viscose yarn with high physical, mechanical, and hygienic indicators was selected as the base model. This choice is explained by the high hygroscopicity, softness, and operational convenience of viscose fibers.

Based on the selected base sample, two-layer knitted fabrics with new structural solutions were developed by modifying structural parameters, yarn combinations, and methods of interlayer bonding. In the course of the research, all samples were created as an experiment using a single raw material - viscose yarn, five types of new-structured double-layered upper knitwear.

The developed new tissues differ from each other in the following main indicators:

- types of weaves and their combination;
- methods of interlayer communication;
- loop formation mechanism;
- Structural structure and arrangement of elements.

In these fabrics, the degree of interconnection of layers, the spatial arrangement of threads, and the combination of loop elements were purposefully modified. As a result, the possibility of controlling the structural parameters of the fabric has expanded. In particular, as a result of the use of derivative and blended weave elements, an increase in interlayer friction forces was observed. This, in turn, contributed to a significant improvement in the

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strength indicators of the fabric, in particular, its resistance to tear and deformation.

One of the important advantages of two-layer knitted fabrics of the new structure is their multifunctionality. Such fabrics have high heat retention properties and, due to their resistance to deformation, ensure long-term shape stability. At the same time, their aesthetic appearance is also formed at a high level.

As a result of the formation of an air layer between the layers, the indicator of thermal insulation increases. This circumstance is especially important for outer knitted products, which significantly increases the operational efficiency of the product.

Conclusion. The main quality indicators of knitted fabrics developed during the experiment were assessed based on a comprehensive approach. In particular, their physical-mechanical, deformation, and hygienic properties were systematically studied. At the same time, the effectiveness of double-layered upper knitwear of a new structure has been scientifically substantiated. The results of experimental work conducted under laboratory conditions showed that the developed knitted fabrics have a high degree of technological stability. Their formation during the production process was stable, and structural defects were practically not observed.

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