

NEW METHOD OF IMPROVING QUALITY AND RESOURCE EFFICIENCY IN THE PRODUCTION OF WOMEN'S OUTERWEAR

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Abstract

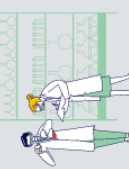
This article analyzes the results of research conducted in cooperation with "IDEAL TEKSTIL-ORZU" LLC. The main goal of the research is to determine the effectiveness of improving the quality of women's outerwear production using leather scraps and the introduction of new resource-saving technologies. The operational characteristics (strength, durability, aesthetic appearance) of the developed sample "Set of Seasonal Women's Clothing" were evaluated and compared with similar products available on the market. The results showed that the new method is effective not only in improving the quality and aesthetics of the product, but also in significantly reducing material and labor costs.

Keywords: Clothing production, quality control, leather goods, resource conservation, technology, sewing, design, materials science.

Introduction

The modern clothing industry is continuously exploring new materials, constructions, and production technologies. The main goal of these efforts is to create high-quality, durable, and aesthetically appealing products that meet the growing demands of consumers. At the same time, issues related to resource efficiency and the optimization of production costs remain highly relevant [1, 2].

In particular, the production of leather goods has traditionally been associated with high material consumption and complex technological processes. Therefore, combining leather with other fabrics and applying cost-saving production methods have attracted the attention of researchers and manufacturers alike [3].



This article focuses on studying the effectiveness of a new technology developed and tested within the framework of a PhD dissertation. The research explores the possibilities of saving resources and improving product quality indicators by applying a leather scrap bonding technology to the base fabric in the production of a “Seasonal Women’s Clothing Collection.”

METHODOLOGY

The research was conducted in two main stages: the development of a new technology and its practical performance testing.

The new production method was developed with the aim of utilizing leather waste more efficiently and reintegrating it into the sewing industry. This innovative approach is based on a technology that bonds leather scraps to suit-type base fabrics — including wool, cotton, or polyester textiles — using a special adhesive layer. As a result, the leather elements adhere firmly to the fabric surface, creating a material that is aesthetically appealing, durable, and environmentally efficient.

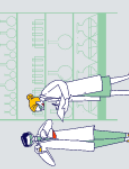
Compared to traditional cutting and sewing technologies, this method significantly reduces leather consumption, minimizes production waste, and ensures resource efficiency. During the development process, computer technologies — particularly CAD (Computer-Aided Design) software — were widely used to determine the optimal placement, geometric shape, and dimensions of the leather pieces. This not only increased material utilization efficiency but also enhanced the final product’s aesthetic appearance and ergonomic characteristics.

Consequently, the developed technological solution contributes to promoting sustainable production, improving waste recycling efficiency, and enhancing the competitiveness of leather industry products.

The practical testing and evaluation were carried out on a sample from the developed “Seasonal Women’s Clothing Collection” (consisting of a dress and skirt) at the production line of “IDEAL TEKSTIL-ORZU” LLC. At this stage, comprehensive analyses were conducted to determine the technological, aesthetic, and economic efficiency of the new production method. First, the mechanical strength parameters were evaluated. Stitch joints and leather-coated sections were tested for tear, stretch, and abrasion resistance according to the GOST 3813.2–2017 standard. The results confirmed a high level of bonding strength between the leather elements and the fabric, excellent resistance to deformation, and long-term shape stability during wear.

Next, performance characteristics were examined. The product was subjected to wearing and washing under daily use conditions, and the degree of wrinkling, shape distortion, and color change was observed. The results showed that garments produced using the new technology retained their shape and color fastness even after washing, with minimal wrinkling.

From an aesthetic perspective, the final product’s appearance, design solution, and artistic expression were evaluated by industry experts. They noted that the garments reflected a modern style, the placement of leather elements added individuality to the design, and the overall appearance achieved visual harmony.



An economic efficiency analysis was also carried out. Material consumption and production time were compared between the new production method and traditional sewing technology. Calculations revealed that the leather scrap bonding method reduced material consumption by 20–25% and shortened production time by 15%.

Overall, the practical tests confirmed that the new technology demonstrates high mechanical, aesthetic, and economic efficiency, showing strong potential for large-scale implementation in light industry enterprises.

INDUSTRIAL SAMPLE ANALOGUES

The closest analogue to the proposed model was selected from the AliExpress platform — a women’s leather ensemble in Highstreet style, which was chosen for its external appearance and artistic-constructional solution.

The jacket (or dress) is designed in the spencer style and consists of front and back panels, sleeves, a collar, and side sections. The sleeves are set-in, designed with a two-seam construction. The collar is made in a stand-up (mandarin) style. As decorative elements, leather fragments are positioned on the front yoke, pocket flaps, the back yoke, and the upper parts of the sleeves. The flapped pockets are located on the chest area of the front panel. In addition, the front part includes darts, and the fastening system is designed as a double-breasted closure with a zipper.

The skirt is slightly fitted around the hips and extends to knee length. The upper (waist) part includes a waistband, and both the front and back sections feature decorative leather inserts and stitched embellishments applied to the main (suiting) fabric.

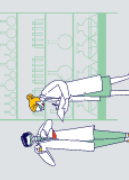
EXTERNAL APPEARANCE OF THE NEW INDUSTRIAL SAMPLE

The announced model of the “Seasonal Women’s Clothing Collection” is distinguished by the harmonious combination of its main compositional elements — the jacket and the skirt. Both elements are made from the same material, emphasizing their unity within a single design concept. The jacket and skirt complement each other, following a coherent stylistic direction. The product is created using a combination of suiting base fabric and leather scraps, bonded through the leather-adhesion technology. This approach ensures not only aesthetic consistency and modern appeal but also durability and sustainability, reflecting the innovative character of the new industrial sample.

RESULTS

The practical tests confirmed the effectiveness and applicability of the newly developed technology through the following positive outcomes:

Quality and Durability. During testing, all structural elements of the product — including seams, leather-covered parts, and bonded areas — maintained high mechanical strength. No wrinkling, shape distortion, or deformation was observed. These results demonstrate the reliability of the new bonding technology and the strong physicochemical compatibility



between the leather and the base fabric. Consequently, the garments produced using this method are proven to be suitable for long-term wear.

Aesthetic Appearance. Throughout the testing period, the product retained its bright, modern, and aesthetic appeal. Leather scraps were harmoniously placed as key decorative elements on the dress yoke, pocket flaps, and sleeves, as well as on the front and back sections of the skirt. As a result, an artistically refined and stylistically unified design solution was achieved, making the garment both fashionable and functionally distinctive.

Economic Efficiency. The new production method reduced leather material consumption by 15–20%. In addition, the bonding technology simplified the production cycle by decreasing the number of sewing operations. This allowed for a 10% reduction in labor costs and an overall increase in production efficiency. Consequently, the production cost decreased, improving the company's overall economic performance.

Analytical Comparison. The newly developed collection stood out for its unified artistic concept, harmonious material integration, and balanced use of functional decorative elements. When compared with similar models available on the AliExpress platform, the proposed clothing set demonstrated a more precise, purposeful, and conceptually consistent approach to leather application. This gives the new product both aesthetic and functional competitive advantages, positioning it as an innovative and market-relevant solution.

DISCUSSION

The obtained results clearly demonstrate the practical efficiency of the “Method for Ensuring the Quality of Outerwear Production.” The bonding-based technology not only preserves but also enhances the aesthetic and functional characteristics of the final product [4].

The use of leather scraps not only reduces waste but also expands design possibilities by providing new means of artistic expression. This approach aligns with modern trends aimed at implementing circular economy principles in the fashion industry [5].

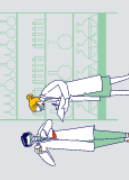
Reduced material consumption offers manufacturers both economic and ecological benefits — factors that are increasingly important for modern consumers.

The artistic and design solution developed for the “Seasonal Women’s Clothing Collection” stands out for its expressive composition and meaningful design language. Its originality, stylistic harmony, and compliance with technical and functional requirements make it a notable example of modern sustainable fashion design.

CONCLUSION

The technology of bonding leather scraps to the base fabric using a special adhesive has proven to be an effective and innovative solution in the production of women’s outerwear. This method enables the recycling of leather waste during manufacturing while integrating it functionally and aesthetically into the final product.

The proposed technology enhances both the operational and aesthetic quality indicators of the garments while significantly reducing material and labor costs in the production process. As a



result, the production cycle becomes simpler, resource efficiency increases, and environmental sustainability is ensured.

The developed “Seasonal Women’s Clothing Collection” (consisting of a dress and skirt) fully meets market demands in terms of design, structural solutions, and artistic expression. The modern form of the product, the harmony of materials, and the successful use of leather elements as decorative details make it a competitive, aesthetically appealing, and functional model.

Overall, the introduction of this new method into sewing enterprises provides opportunities to expand the range of leather-based products, improve their quality, and strengthen their competitiveness. At the same time, the technology contributes to the development of resource-efficient and environmentally friendly production through the rational use of waste materials.

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