FERGANA VALLEY SEWING AND KNITTING ENTERPRISES NEW SKETCH MODEL IN CONDITIONS STUDY OF THE PRODUCTION OF SAMPLES

Mamatqulova Saida Rakhmatovna

Doctoral Student, Department of Light Industrial Products Technology, Fergana Polytechnic Institute, Fergana, Uzbekistan

E-mail: saida.mamatqulova.1989@gmail.com

Abstract

In the sewing and knitting industry, parallel jumpers play a critical role in the production of garments such as men's windbreakers, children's polo shirts, and t-shirts crafted from knitted fabrics. Their use is essential for ensuring high-quality seams and enhancing the durability of these materials, especially those with high elastic properties. The application of parallel jumpers significantly improves the efficiency of sewing processes, particularly in handling fabrics that require flexibility and resilience in their finished seams.

Keywords: integral-differential, physical-mathematical model, parallel needles, sewing machine, finished fabric

Introduction

The Fergana Valley, known for its rich cultural heritage and skilled craftsmanship, has become a significant hub for the sewing and knitting industry. In recent years, the demand for high-quality garments, such as windbreakers, polo shirts, and t-shirts, has spurred innovation in production techniques and garment design. One key area of development within the industry is the implementation of new sketch models for garment production, which aim to improve both the quality and efficiency of manufacturing processes [1].

This study focuses on the practical application of these new sketch models within sewing and knitting enterprises in the Fergana Valley. Specifically, it examines how the introduction of these models influences the production of sample garments, particularly those made from knitted fabrics. By analyzing production conditions, this research highlights the benefits of employing advanced sewing technologies, such as parallel jumpers, to address challenges in stitching elastic materials [2,3].

The study's findings aim to provide insights into the broader implications of modernizing garment production in the region, with a focus on enhancing product quality, durability, and competitiveness in the global market. As the Fergana Valley's sewing and knitting enterprises continue to evolve, understanding the impact of these innovations on production workflows is critical for sustaining growth in this sector.

Materials and methods

The study was conducted using a range of knitted fabrics commonly employed in the production of men's windbreakers, children's polo shirts, and t-shirts. The selected fabrics exhibited varying levels of elasticity, with a focus on materials that are challenging to sew due to their stretchable properties. These included:

– Cotton-knit fabrics: Known for their softness and breathability.
– Polyester-knit blends: Valued for their durability and resistance to shrinking.
– Elastane-infused fabrics: Featuring a high degree of elasticity, often used in athletic wear.

The sewing equipment used in this study included industrial sewing machines outfitted with parallel jumpers, a specialized mechanism that helps maintain uniform stitch quality across elastic fabrics. These machines were specifically configured to handle different stretch levels, ensuring accurate stitching and minimal material deformation.

1. Sample Preparation

   Garment samples were designed based on the newly proposed sketch models, which aimed to improve seam strength and visual appeal. These models were developed with attention to modern fashion trends and production efficiency. Men's windbreakers, children's polo shirts, and t-shirts were selected as the primary garment types, with sample sizes reflecting standard industry practices [4,5].

2. Sewing Process.

   The sewing process was carried out using parallel jumpers to evaluate their impact on seam durability, elasticity, and overall garment quality. Three different sewing methods were employed:

   – Standard seam method: For comparison, traditional sewing techniques were used without the inclusion of parallel jumpers.
   – Parallel jumper-assisted sewing: The new technology was tested across various fabric types, focusing on stretchability and seam quality.
   – Hybrid method: A combination of traditional and jumper-assisted methods was tested to assess potential improvements in production efficiency.

3. Seam Durability Testing

   Once the garment samples were produced, seam durability testing was conducted using a standardized tensile strength testing machine. The seams were subjected to varying levels of stress to measure their resistance to tearing, fraying, and seam slippage, particularly in areas with high elasticity. Tests were carried out under controlled conditions to ensure consistent results across all sample garments.

4. Quality Evaluation

   The finished garments were evaluated based on multiple criteria:

   – Seam consistency: Visual inspection for any irregularities in stitch patterns.
   – Elastic recovery: Measurement of the fabric's ability to return to its original shape after being stretched.
   – Comfort and fit: Wearability tests were conducted to assess the practical impact of the seams on the overall fit and comfort of the garments.

5. Data Analysis

   The data collected from seam durability and quality testing were analyzed statistically to identify significant differences between the different sewing methods. The aim was to determine the effectiveness of the parallel jumper-assisted method in improving the strength, elasticity, and overall quality of seams in highly elastic fabrics.

Results and discussion

The right approach to the design process is required in the production of light industrial products. Currently, the sewing and knitting enterprises of our Republic produce clothes according to international, European and Russian standard sizes and measurements (Table 1). These

standards are developed based on the measurements of the circumference of the chest, waist and hips.

Table 1 . International, European and Russian standard sizes (cm)

Russian size	Chest circumference	Waist circumference	Chest circumference	International size	European sizes		
					Height-165	Height 166-171	Height-171
40	74-80	60-65	84-90	XS	16	32	-
42	82-85	66-69	92-95	XS	17	34	68
44	86-89	70-73	96-98	MM	18	36	72
46	90-93	74-77	99-101	L	19	38	76
48	94-97	78-81	102-104	XL	20	40	80
50	98-102	82-85	105-108	XL	21	42	84
52	103-107	86-90	109-112	XXL	22	44	88
54	108-113	91-95	113-116	XXXL	23	46	92
56	114-119	96-102	117-121	-	24	48	96
58	120-125	103-108	122-126	-	25	50	100
60	126-131	109-114	127-132	-	26	52	104

There are various formulas for determining the optimal ratio of a person's weight and size. However, people of the same height and weight can have different obesity (Tables 1 and 2). Therefore, it is necessary to pay great attention to these in the production of the product structure.

Table 2. Man your figure tall and full standard dimensions

Height (cm)	The age of a person									
	20-29		30-39		40-49		50-59		60-69	
	Human gender									
	E	A	E	A	E	A	E	A	E	A
150	51.3	48.9	56.7	53.9	58.1	58.5	58.0	55.7	57.3	54.8
152	53.1	51.0	58.7	55.0	61.5	59.5	61.0	57.6	60.3	55.9
154	55.3	53.0	61.6	59.1	64.5	62.4	63.8	60.2	61.9	59.0
156	58.5	55.8	64.4	61.5	67.3	66.0	65.8	62.4	63.7	60.9
158	61.2	58.1	67.3	64.1	70.4	67.9	68.0	64.5	67.0	62.4
160	62.9	59.8	69.4	65.8	72.3	69.9	69.7	65.8	68.2	64.6
162	64.6	61.6	71.0	68.5	74.4	72.2	72.7	68.7	69.1	66.5
164	67.3	63.6	73.9	70.8	77.2	74.0	75.6	72.0	72.2	70.7
166	68.8	65.2	74.5	71.8	78.0	76.6	76.3	73.8	74.3	71.4
168	70.8	68.5	76.2	73.7	79.6	78.2	79.5	74.8	76.0	73.3
170	72.7	69.2	77.7	75.8	81.0	79.8	79.9	76.8	76.9	75.0

Table 3 . Compatibility of height and weight measurements for women

Normal weight				Excess weight		
Height (cm)	Lean body (kg)	Average height (kg)	Lean figure (kg)	Obesity (kg)	I-II obesity (kg)	III-IV group obesity (kg)
147	41-44	43-48	47-53	54-62	63-84	85-117
149	42-45	44-49	48-55	56-65	66-87	88-121
152	43-47	45-51	49-56	57-67	68-90	61-126
154	44-48	47-52	50-58	59-69	70-93	84-129
157	46-49	48-53	52-59	60-71	72-96	97-134
160	47-51	49-55	53-60	61-74	75-98	100-137
162	48-52	51-57	54-62	63-76	77-103	104-140
165	50-53	52-58	56-64	65-79	80-106	107-145
167	51-55	54-61	58-66	67-81	82-109	110-151
170	53-57	56-63	60-68	69-84	85-113	114-156

Fargona "ARGOLID" and " Babur Fayz" LLCs have started producing men's knitted t-shirts based on a table of measurements (Fig. 1).

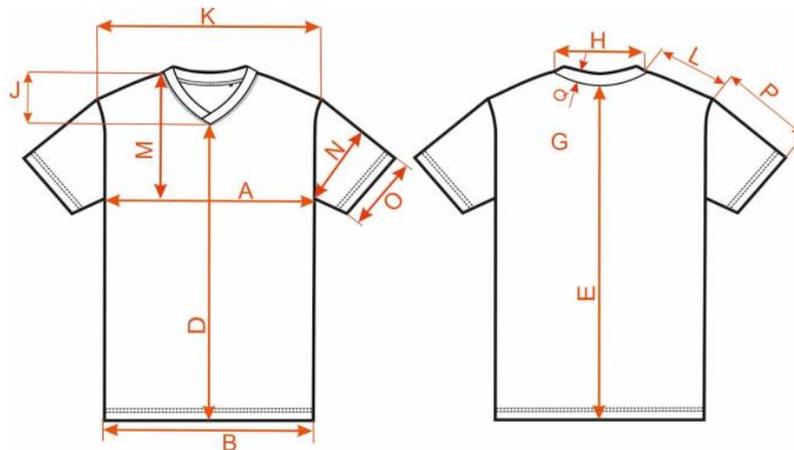The T-shirt is designed based on International standard sizes (Table 4).

Figure 1. "ARGOLID" and " Babur Fayz " LLC work being released men knitting T-shirts

Table 4. A table of measurements of "ARGOLID" and " Babur Fayz " LLC

No	Size names	Dimensions tabelmeri						Dimensions between difference	The difference
		Dimensions							
		S	M	L	XL	2XL	3XL		
		46	48	50	52	54	56		

A	Front flower width	53	55	57	59.5	62	64.5	2.0	2.5	±1
B	Hem width	53	55	57	59.5	62	64.5	2.0	2.5	±1
D	Front flower hit length	54	56	58	60	62	64	2.0	2.0	±1
E	Ort flower hit length	67.2	69	70.8	72.6	74.4	76.2	1.8	1.8	±1
H	The collar of his name width	19.6	20	20.4	20.9	21.4	21.9	0.4	0.5	±1
J	Collar of his name depth	15.6	15.8	16	16.2	16.4	16.6	0.2	0.2	±0.5
K	Shoulder width	45.3	46.5	47.7	49.1	50.5	51.9	1.2	1.4	±1
L	Shoulder width	13.2	13.6	14.0	14.5	15	15.5	0.4	0.5	±0.5
M	Eat of his name height	26.1	27	27.9	29	30.1	31.2	0.9	1.1	±1
N	Eat it width	23.3	24	24.7	25.6	26.5	27.4	0.7	0.9	±1
O	Eat tip width	19.4	20	20.6	21.3	22	22.7	0.6	0.7	±1
P	Eat it length	22	22.5	23	23.5	24	24.5	0.5	0.5	±1
Q	Beyka width	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	±0.2

Fargona " Dosco Textile " private in the enterprise children knitting topigi (Fig. 2) and t-shirts size in tune (Table 5). Table of measurements based on work in withdrawal.

Figure 2. " Dosco Textile " private in the enterprise work being released children knitting top

Table 5. A table of measurements of "Dosco Textile " private enterprise

No	Dimensions	104	110	116	122	128	The difference
		4	5	6	7	8	
A	Width of the front flower	32.5	33.5	34.5	35.5	36.5	±1
B	The width of the collar	15.5	16	16.5	17	17.5	±0.5
C	The depth of the collarbone	7	7.3	7.6	7.9	8.2	±0.5

D	Shoulder width	6.8	7	7.3	7.6	7.8	±0.5
E	Sleeve length	11.5	12.2	13	13.7	14.5	±1
F	Sleeve width	11.8	12.2	12.6	13	13.4	±0.5
G	Sleeve height	15.4	15.8	16.2	16.6	17	±0.5
H	Hem width	31.5	32.5	33.5	34.5	35.5	±1
I	Length of clothes	45	47	49	51	53	±1

Namangan "IMRON TEXTILE GROUP"

Tr	technological (immortal) operations	Specialty	Razryadi	Consumption and qt	Tools and equipment
1	Bending the ribbon	UM	1	0.84	Jack JK T-1310
2	Joining the rib to the base	MM	3	5.25	
3	Give a decorative stitch to the rib on the front piece	UM	3	6.61	
4	Joining the rib to the back piece	MM	3	8.02	
5	Becca the back rib stitch	MM	3	15.86	
6	Add a decorative stitch to the back rib stitch	UM	3	10.87	
7	Connecting the sleeves	MM	3	37.83	
8	Sewing the hem	MM	3	12.72	
9	Ruching the sleeve	MM	3	10.18	
10	Give the T-shirt moisture heat treatment	D	2	55.1	
11	Putting on a T-shirt and making packaging	Q	2	30.02	
	Total: 190.3				

Take it went experimental studies as a result industry conditions work being released sewing and knitting to products (xar one assortment for separately) " Technical conditions » available that it is not identified. This is it dissertation at work above-given problems the solution to find for sewing and knitting products work taken out for the «technician create conditions» task set received Based on the statistical data and the analysis of sewing machine equipment available in the industry, the task of determining the time spent in the process of sewing various sewing and knitting products was determined.

Based on the experimental test, construction drawings were developed according to size standards for a table of measurements of the sewing and knitting industry, which produces t-shirts (men's, women's, children's), robes, and dresses.

Produced by "ARGOLID", "BABUR FAYZ", "DOSCO TEXTILE" release in enterprises of products bet technological sequence made up. In enterprises being used modern seam equipment analysis is done and the optimal option from the device bet for expendable of time

average norm according to technical a must work developed.

Conclusions

This study explored the implementation of new sketch models in the production processes of sewing and knitting enterprises within the Fergana Valley, focusing specifically on the use of parallel jumpers in the manufacture of elastic fabric garments such as men's windbreakers, children's polo shirts, and t-shirts. The findings indicate that the integration of parallel jumpers significantly enhances the quality of seams, especially when working with high-elasticity fabrics.

Key conclusions drawn from the study include:

1. Improved Seam Durability: The use of parallel jumper-assisted sewing techniques resulted in stronger, more resilient seams capable of withstanding high levels of stretch and wear. This is particularly important for garments made from highly elastic materials, where traditional sewing methods may lead to seam slippage or tearing.

2. Enhanced Production Efficiency: Incorporating parallel jumpers into the production process not only improved seam quality but also reduced the time required to complete complex stitching tasks, leading to increased productivity in garment manufacturing.

3. Greater Fabric Elasticity Management: The elasticity recovery of the fabrics tested showed that parallel jumper methods allowed for a smoother recovery of the garment's original shape after being stretched. This contributes to the comfort and fit of the finished products, enhancing their overall appeal to consumers.

4. Scalability for Industrial Use: The findings suggest that the proposed sketch models and the integration of parallel jumpers can be scaled up for broader use across other garment types, making them highly valuable for larger-scale production in the region's growing textile industry.

In conclusion, the adoption of modern sewing technologies, such as parallel jumpers, in combination with innovative sketch models, represents a significant advancement for sewing and knitting enterprises in the Fergana Valley. This approach not only improves the quality of garment production but also positions these enterprises for enhanced competitiveness in both domestic and international markets.

References

1. Raxmatovna, M. S. (2022). Analysis of women's clothes sewing study to develop a norm of time spent on the technological process of knitting production. *International Journal of Advance Scientific Research*, *2*(03), 16-21.

2. Raxmatovna, M. S., & Tuychibayevich, I. N. (2024, May). Trikotaj mahsulotlarni ishlab chiqarishning iqtisodiy samaradorligi. In *Proceedings of Scientific Conference on Multidisciplinary Studies* (Vol. 3, No. 5, pp. 188-194).

3. Tadjikuziyev, R. M., & Mamatqulova, S. R. (2023). Rezina va nometal qismlarni ishlab chiqarish texnologiyasi. *Science and Education*, *4*(2), 638-649.

4. Bazarbayeva, G., & Ismatullayev, N. (2023, June). Development of the concept of the process of predicting the economic efficiency of new models at the sketch stage. In *AIP Conference Proceedings* (Vol. 2789, No. 1). AIP Publishing.

5. Reprogramming the hand: Bridging the craft skills gap in 3D/digital fashion knitwear design, J Taylor, K Townsend – Craf.