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Manufacture of Single Cotton Fabric with New Composition, Specified Bend from Yarn Gathered from Local Raw Material Cotton Fiber

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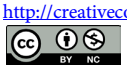

Abstract

The article created 21 types of fabrics for the new composition of dublerin. Tests of various types of weave, fiber composition and yarn count are shown in various ways. The physical and mechanical parameters of the test samples were determined and analyzed at the "Accredited Testing Laboratory for Light Industry Products" at the State Unitary Enterprise "Namangan Center for Testing and Certification". The reason for such a low performance of the motos of number 15 produced in the scientific research work is that the linear densities of the body and the yarn are four times different, despite the weaving of the fabric. Elongation at break is also dependent on penetration.

Keywords

Weaves, Warp, Weft, Dublerin, Canvas, Reps, Surface Density, Fabric

1. Introduction

In the textile industry, the comprehensive solution to the issues of thread and fabric production and their delivery to the finished product, as well as the use of local raw materials, is of great importance in the development of light industry.

The demand for textile and light industry products in the world market is constantly increasing. Intensive growth of the population leads to a continuous increase in the demand for these products. For this reason, the amount of capital invested in these areas on a global scale has always been high. Accordingly, the

assortment, quantity and quality indicators of the products produced in this field are constantly changing, and the production technology and equipment are also improving accordingly. Various structural elements are used in ready-made sewing products to improve their consumer properties. Among them, the shape and appearance of sewing items, especially the cotton fiber-based stiffened fabrics, are of great importance.

Countries such as Germany, China, India, the Republic of Korea, the USA, and Turkey are among the leading countries in the world textile industry. Today, 50% of knitted fabrics in the world are produced in China and India. In exchange for reducing its wholesale and retail prices, the amount of scientific and practical research is increasing. In this regard, research aimed at the development of methods and means of production, the creation and introduction of new, compact and resource-efficient technologies, takes a special place in terms of urgency[1].

2. Methodology

In recent years, the development of the textile, sewing-knitting, leather-shoes and fur sectors of the light industry in our republic, the production of finished products with high added value through deep processing of textile raw materials, Comprehensive measures are being implemented to expand the types and assortment of manufactured products, as well as to comprehensively support the investment and export activities of branch enterprises. In this regard, it is of great importance to start the production of knitted fabrics, which are considered the main structural element of sewing products, serve to ensure the high consumer properties of the product, and replace imports.

In the Strategy of Actions for further development of the Republic of Uzbekistan in 2017-2021, including "... increasing the competitiveness of the national economy, ... reducing the consumption of energy and resources in the economy, mastering in principle new types of products and technologies, on this basis, internal and ensuring the competitiveness of national goods in foreign markets" are defined. In the implementation of these tasks, the production of high-quality and low-cost knitted fabrics with the necessary technological and structural parameters plays an important role[2].

PF-4947 of the President of the Republic of Uzbekistan dated February 7, 2017 "On the Strategy of Actions in Five Priority Areas of Development of the Republic of Uzbekistan in 2017-2021"[3], 14/2017 December PF-5285 "On Measures for

[1]Decision PQ-4453 of the President of the Republic of Uzbekistan dated September 16, 2019 "On measures to promote the further development of light industry and production of finished products".

[2]Resolution PQ-4186 of the President of the Republic of Uzbekistan dated February 12, 2019 "On measures to further deepen the reform of the textile and sewing-knitting industry and expand its export potential".

[3]Decree of the President of the Republic of Uzbekistan, dated 07.02.2017 No. PF-4947.

Rapid Development of the Textile and Sewing-Knitting Industry"[4], April 17, 2019 PF-5708 "Measure to Improve the State Management System in Agriculture"-activities" [5], Resolution No. PQ-3408 of November 28, 2017 "On measures to fundamentally improve the management system of the cotton industry"[6], and this activity. This study serves to a certain extent the implementation of tasks defined in other relevant legal documents.

In order to give the necessary shape to the textile products, to regulate the deformation of the responsible parts of the sewing fabrics, and to ensure their quality, stiffening fabrics are used. It is purposeful to analyze the state of researches dedicated to increasing the technologies of production of knitted fabrics, their structure and types according to the goals and tasks depending on the task [1].

One of the main quality indicators of knitted fabrics is the flexibility in bending. In the years 1990-1994, "DUBLERIN" LLC in our country produced knitted fabrics with cotton thread. The quality indicator of the suits made of these knitted fabrics began to change due to rain, snow or moisture in the front part [2]. As a result of humidity and construction, the coefficient of shrinkage of the fabric of the suit is increased. Garment enterprises in Uzbekistan have been buying knitted fabrics from abroad since 1995 until now, mainly at the expense of imports.

Classification and regulatory documents have been prepared in the industry for production control and bookkeeping, for the use of fabrics used in tailoring in a certain order. Depending on the purpose, the classification of textile fabrics can be combined with one or more indicators. An example of classification with one pointer can be cited [3]. In it, tissues are divided into the following three groups:

1) It should not exceed 1.5% of alcohol and alcohol when used very little.

2) In the case of low consumption, it should not exceed 3.5% by weight and 2% by weight.

3) The content should not exceed 5% by weight and 2% by weight.

Which of the above-mentioned groups of existing fabric is suitable is determined according to standard technical requirements. Depending on the production of knitted fabrics and their use in sewing, they are produced from yarns spun from a mixture of cotton, linen, lavsan and other fibers according to the composition of raw materials. Technical requirements for knitted fabrics have been developed with the aim of increasing the type of knitted fabric and organizing their effective use in light industry. In the classification, the general indicators of the use of the fabric, structural indicators, etc. are taken into account. Depending on the method of production, knitted fabric is divided into large classes made of woven, knitted and non-woven fabrics [4].

[4]Decree of the President of the Republic of Uzbekistan dated 14.12.2017 No. PF-5285.
[5]Decree of the President of the Republic of Uzbekistan No. PF-5708 dated 04/17/2019.
[6]Decision of the President of the Republic of Uzbekistan, dated 28.11.2017 No. PQ-3408.

The first-class knitted fabrics are made from fabrics obtained from weaving, and their surface is covered with glue. According to the second class, the knitted fabric is obtained by the method of knitting, and it is obtained as a result of coating its surface with glue. Glue is sprayed on the surface of non-woven fabrics produced by different methods (chemical, mechanical and mixed). Depending on the type of used items, each major class is divided into small classes: pal to, plah, suit, shirt and trousers [5].

In addition, knitted fabrics are divided into types depending on their use in textiles, shoe production, automobile industry, aviation industry and many other fields [6]. One of the main properties of the fabric, which ensures the preservation of the necessary shape of sewing items, is determined by the Gost 29104.21-91 [7] standard. Thomas Howard Aybum Uni from America, Sabit Adanur Aybum Uni and Mehmed Emin Yuksakkaya Usak Uni from Turkey have shown the influence of angle coefficients and points affecting force and the type of shear on the index in determining the uniformity of gas frames in bending [8].

The first stage of experimental work was carried out in the scientific laboratory of the "Technology of textile fabrics" department of the Tashkent Textile and Light Industry Institute (TTLII). Textiles were produced on the AT-100-5M loom installed in the laboratory.

According to the requirements, the bending uniformity indicators of the knitted fabrics are based on 3 types of fabrics, i.e. canvas, sari 1/3 and 2/2 hemp and 1G'3 sari based on complex weaves. the fabrics were placed on the machine through a full placement picture.

In the production of sample fabrics on the machine, the fiber content was 100% 19-ply cotton single yarn, 24-ply single yarn was made from a mixture of 70% cotton and 30% polyester fiber, and 100% polyester fiber (41 × 2) 82-ply baked, 11 and Single threads of 17 tex were used in the rope system. For the fabric to be produced, the fiber content of the tanda system yarns is the same, and a 20-teck single yarn spun from cotton fiber was selected[7].

Medium fiber cotton is mainly grown in Uzbekistan. 20 tex yarn is mainly produced from such fibers in spinning enterprises. In addition, in order to meet the technical requirements of the dissertations on the production of knitted fabrics and the body part of the suit, for the fabrics produced in the research work, a yarn with the same linear density of 20 tex and fiber content of 100% cotton fiber was selected for the tanda system [9]. In the scientific laboratory under the "Spinning Technology" department of TTLII, yarns of the tanda system were spun. Physico-mechanical properties of yarns produced for research in the "Centex Uz" laboratory at TTLII were determined by UzDst 2321-2011[8] and UzDst 2322-2011[9] standards. The physical and mechanical properties of the raw materials of the manufactured fabrics and hemp threads have been

[7]Technical fabrics method for determining bending stiffness GOST 29104.21-91.
[8]UzDst 2321-2011 standart.
[9]UzDst 2322-2011 standart.

determined.

3. Results

In order to study the quality indicators of the fabric, twenty-one samples were developed. The obtained samples were woven on the basis of the parameters of the fabrics listed in Table 1. The obtained samples differ from each other in terms of fiber composition, linear density and types of weaving. In the table, the serial number of fabrics produced in the fabric column with the symbol No. is shown.

Samples of 100 × 200 cm size were prepared from each variant of the manufactured fabric, and the physical and mechanical properties of the 50 × 100 cm raw fabric were tested at the "Light Industrial Products Accredited Testing Laboratory" under the "Namangan Testing and Certification Center" DUK.

Table 1. Boarding indicators of manufactured fabrics.

No. fabric	Fiber composition of yarns		Type of mowing	Linear density of hemp yarn, tex	Density, ipG's		The width of the cutting of the fabric	Raw fabric width
	Warp	Weft			warp	weft		
1.	cotton	100% polyester	Two-layer fabric made on the basis of 1/3 chain and 2/2 reps	41 × 2	260	240	100 cm	90 cm
2.		100% polyester		11				
3.		30% polyester va 70 % cotton fiber		24				
4.		100% polyester	1/3 cutting	41 × 2				
5.		polyester		11				
6.		30% polyester va 70 % cotton fiber		24				
7.		100% cotton		19				
8.		30% polyester va 70 % cotton fiber	Canvas	24				
9.		100% polyester		11				
10.		100 % cotton		19				
11.		100% polyester		41 × 2				
12.		30% polyester va 70 % cotton fiber		24				
13.		100% polyester		11				
14.		100% cotton fiber		19				
15.		100% polyester		41 × 2				
16.		100% polyester	Two-layer fabric made on the basis of 1/3 chain and 2/2 reps	41 × 2				
17.		30% polyester va 70 % cotton fiber		24				
18.		100% cotton fiber		19				
19.		30% polyester va 70 % cotton fiber	1/3 cutting	24				
20.		100% polyester		11				
21.		100% cotton fiber		19				

Developed by the People's Republic of China quality indicators were determined by the Gost 3813-72 standard on the released HD-B617 cutting equipment, the fabric density by the Gost 3812-72 standard, and the air permeability on the VTTM-2M equipment by the Gost 12088-77 standard.

The knitted fabrics produced at the private enterprise "Natural Fabrics Textile" in Namangan region were combined with the aura part of the costume. The physico-mechanical properties of the manufactured fabric after joining with the avra part of the Suit are shown in **Table 1**. In the "Shengtian" pressing unit of the "Disen" company, manufactured in the People's Republic of China, the fabric and aura parts were attached, and the board of the suit was obtained.

There are three types of wet-heat work in sewing: ironing, pressing and steaming. In the research work, the avra and the warp fabric were attached in these ways. Press the heated surface of the iron a little on the gas, Pushing along the wetted detail, working with wet-heat is called ironing is called The research work was carried out in the conditions where the temperature of the pressing surface was 150˚C, the duration of pressing was 10 s, and the pressure of the pressing surface was 0.3 - 0.5 kg*s/cm. Adhesive materials and methods of gluing them were used in accordance with the technical description of the model. Glued seams are attached in such a way that the thread direction is the same as the thread direction of the main detail.

4. Discussion

The physical and mechanical properties of the attached parts of the suit were determined at the "Light Industry Products Accredited Testing Laboratory" under the "Namangan Testing and Certification Center" DUK. The physico-mechanical parameters of the produced fabrics in Appendix 3 and the changes in the physical-mechanical parameters of the knitted fabrics in Appendix 4 after being attached to the avra part of the suit were analyzed by the graphs in **Figures 1-4**.

In the graphs in the figure (see **Figure 1** & **Figure 2**), it can be seen from the analysis of the results of the elongation at break in the body and the warp thread that 4. It is not recommended for production due to the fact that the elongation index of the produced fabric differs from one another in the direction of the warp thread. Because the penetration coefficients of the two fabrics give different results after attaching the fabric to the fabric, the separation index of the two fabrics gives a negative result after the clothes are washed.

5. Conclusions

As can be seen from the graph in **Figure 3** and **Figure 4**, the fabrics after joining the 15th weave and knit fabric with the aura part of the suit have the lowest performance. The reason for such a low performance of the motos of number 15 produced in the scientific research work is that the linear densities of the body and the yarn are four times different, despite the weaving of the fabric. Elongation

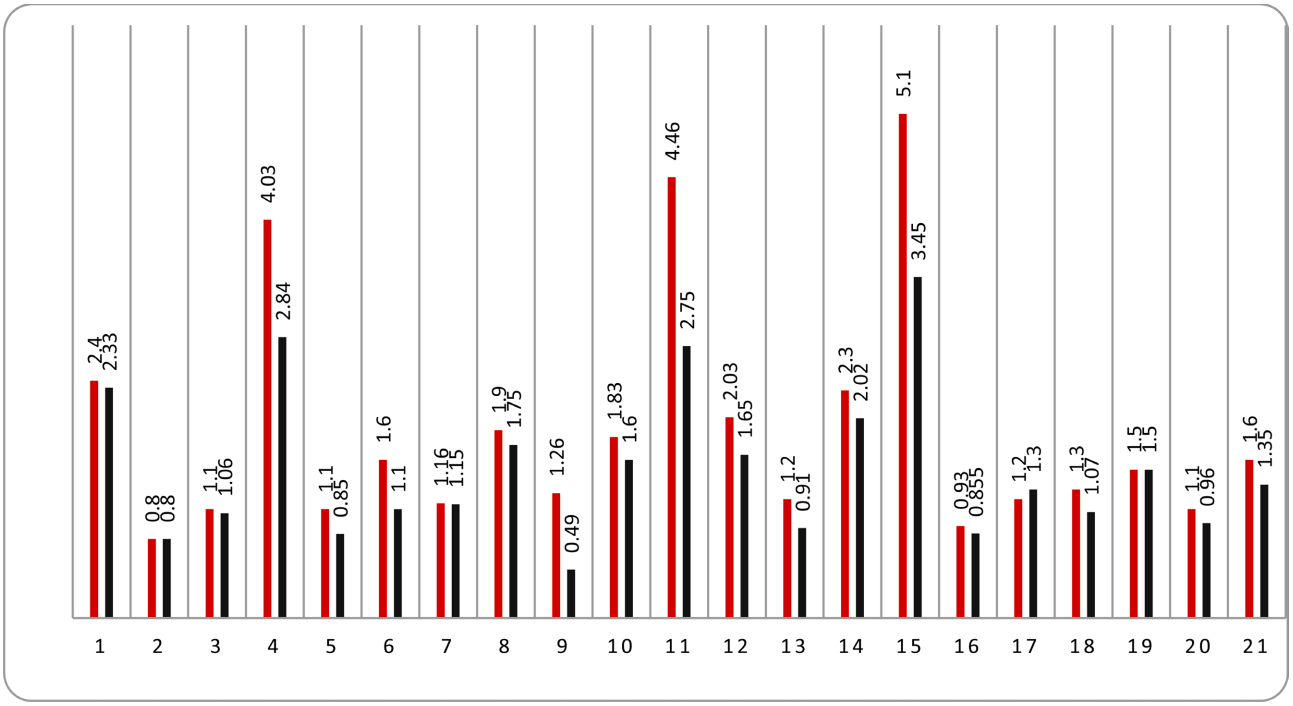

Figure 1. Analysis of the Elongation Results at Break in the direction of the body thread after joining the manufactured fabric and knitted fabric with the avra part of the Suit.

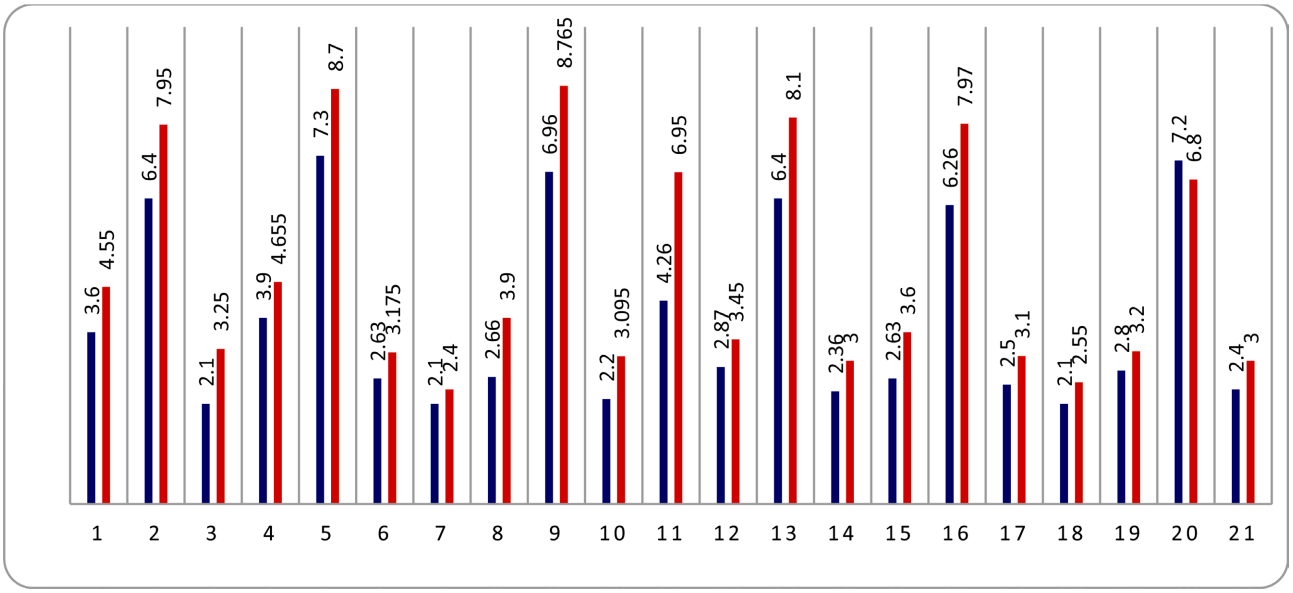

Figure 2. Analysis of the elongation results at break in the weft thread direction of fabricated fabrics and spliced fabrics after bonding with the outer part of the suit.

at break is also dependent on penetration. A.A. Levina in his research work studied the effect of the filling coefficient of the fabric on warp and weft yarns on its consumption properties, and this process can be observed in the penetration of warp and weft yarns as a result of changing the properties of the yarns.

But the reason why the fabric of number 15 gives the highest result after being attached to the aura part of the costume is due to the strength of the glue and the

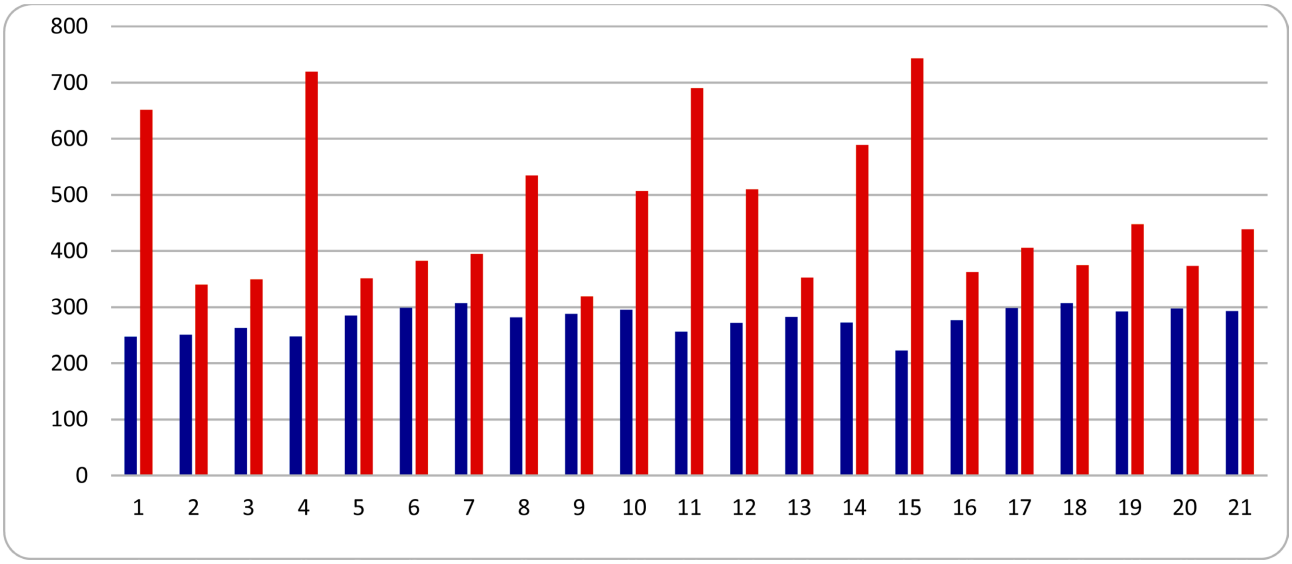

Figure 3. Analysis of the breaking strength results in the direction of the thread after attaching the produced fabric and the knitted fabric to the outer part of the suit.

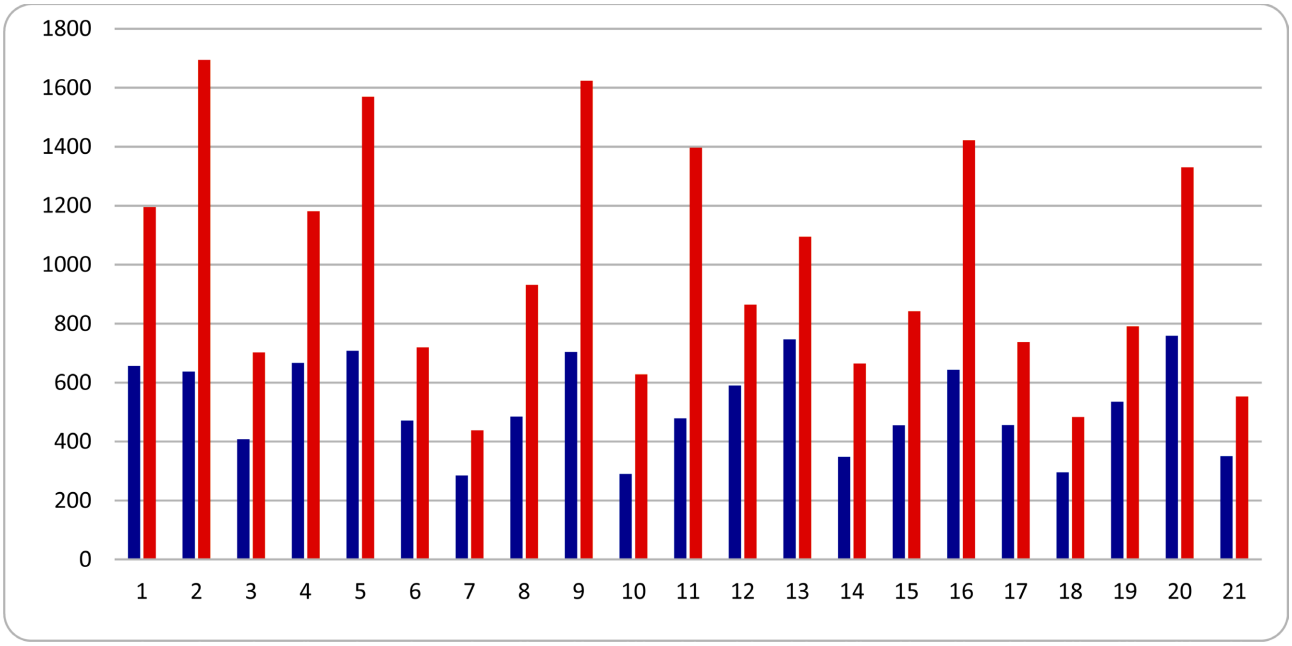

Figure 4. Analysis of the tensile strength results in the direction of the weft thread after attaching the manufactured fabric and the knitted fabric to the outer part of the suit.

aura. It is recommended to use the fabric number 15, which was produced in the research work of this indicator, for the coat, taking into account that the parts attached to the avra part of the suit correspond to the standard requirements of GOST 29223-91. The analysis of the results of the elongation at break in the direction of the weft thread after attaching the manufactured fabric and the knitted fabric to the outer part of the suit is shown. The reason why the manufactured warp fabrics of No. 13 and No. 20 have the highest index is due to the high penetration coefficient due to the closeness of the index of linear density of warp

and weft yarns.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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