

**ИССЛЕДОВАНИЕ ОСОБЕННОСТЕЙ ТЕХНИКИ «НУНОФЕЛТИНГ»
С ЦЕЛЮ СОЗДАНИЯ УНИКАЛЬНЫХ МОДЕЛЕЙ ИЗДЕЛИЙ
В ЭТНОСТИЛЕ**

**THE INVESTIGATION OF THE "NUNOFELTING" FEATURES TECHNIQUE
TO CREATE UNIQUE MODELS IN ETHNIC STYLE**

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В статье представлен способ изготовления многослойного полотна из войлока в технике «нунофелтинг» в этностиле с раскладкой на принтованный шифон, изготавливаемый методом сублимационной печати. Рассмотрены техника изготовления, востребованность и ценность изделий из войлока, представлен анализ роли войлочных изделий в жизни кочевых народов Казахстана, рассмотрены вопросы использования нуновойлока для изготовления валяльно-войлочных изделий женского ассортимента, орнаментальных композиций для художественно-колористического оформления изделия, использования войлока дизайнерами при изготовлении современной одежды, а также серийного изготовления войлочных изделий. Авторы предлагают развивать творческо-проектную деятельность по применению войлока, так как декоративно-прикладное искусство помогает сохранять национальную идентичность. В представленных моделях коллекции женской одежды из войлока используются сочетания войлока с шифоном с национальными узорами и орнаментами, что позволяет рассматривать изделия из войлока как бренд Казахстана.

The article presents a manufacturing method of a multilayer felted fabric with the "nunofelting" technique in an ethno style with a layout on printed chiffon made by sublimation printing. The technique of manufacturing, the demand and value of felt products are considered, the analysis of the role of felt products in the life of the nomadic peoples of Kazakhstan is presented, the issues of the use of felt for the manufacture of felting products of women's assortment, ornamental compositions for artistic and coloristic design of the product, the use of felt by designers in the manufacture of modern clothing, as well as serial manufacture of felt products are considered. The authors propose to develop creative and project activities with the use of felt, as decorative and applied art helps to preserve national identity. Combinations of felt with chiffon are used with national patterns and ornaments in the presented models of women's felt clothing collection, allowing felt products to be considered as a brand of Kazakhstan.

Ключевые слова: войлок, многослойное полотно, войлоковаление, техника нунофелтинг, принтованная ткань, изделие, качество.

Keywords: felt, multilayer fabric, felting, nunofelting technique, printed fabric, product, quality.

Introduction. The opportunity to represent Kazakhstani fashion outside the country has contributed to the fact that many fashion designers have changed their attitude to traditional clothing and the ways of its production. The appearance of new technologies for molding parts makes it possible to increase the clothing manufacturing production efficiency and reduce their technological process by eliminating some of its stages. The prospects of using felt for these purposes are due to the good consumer properties of wool materials, primarily high hygienic indicators - air permeability/porosity and moisture capacity, as well as operational - wear resistance/durability and resistance to pilling. The advantages of felt products are: the possibility of manufacturing form-resistant volumetric parts without seams; the formation of a package of materials with specified properties while reducing the thickness and quantity of applied materials used; reducing the material intensity and manufacturing complexity [1,2]. This determines the prerequisites for the creation of an innovative technology of making clothes from environmentally friendly materials. Yu.Yu. Firsova [3], L.S. Bektemirova [4], J.A. Sydykova [5] belong to the scientific research that was carried out in the field of felting technology, the development of methods for designing and manufacturing felt products, S.G. Batyreva, who studied the history and ethnoculturology of felt products from museum collections in Russia [6].

Research methods. The felt manufacturability is known, which is provided due to the felting capacity of wool fibers and the high molding ability of semi-processed products from them, there is experience in small-scale manufacturing of molded felt hats and shoes. However, the problem of mass production of voluminous felt clothing in the "nunofelting" technique has not been studied yet. There are no practical and theoretical approaches to the manufacture of parts and items of such cloth-

ing in accordance with the specified requirements. It is necessary to form the concept of the felt products design process in the "nunofelting" technique, combining the stages from the creation of a draft design, the manufacture of a felt semi-processed product to the manufacture and finishing of the product into a single continuous technological process.

Modern technologies and materials have helped to take a fresh look at felting and ways of using it. Nunofelting is one of the modern technologies for decorating felt products. The essence of this technology is the felting of wool to fabrics. So, one canvas is obtained from two completely different materials called nunofelting.

The object of the study is the technological process of obtaining a nuno-canvas made of felt with chiffon and making models from them women's suits, differing in a variety of shapes and types of prints.

The aim of the research work is to create a multi-layered canvas in the "nunofelting" technique by putting layers of wool fibers on the basis of printed chiffon fabric for the manufacture of unique costume models. The following tasks have been set to achieve this goal:

- analysis of existing methods of manufacturing felt products and ways to improve them to create a multi-layered canvas in the "nunofelting" technique, which contributes to the expansion of the artistic and decorative variety of the range of sewing products;
- study of the influence of technological parameters of the fabric manufacturing process on the properties of felt clothing parts;
- improvement of the "nunofelting" technique for creating a multi-layered fabric used for designing clothing details of a given volumetric shape made of felt and its texture;
- testing the results of the work.

The scientific novelty of the work consists in:

- the developed "nunofelting" technique for the of multilayer fabrics manufacture used for felt parts of clothing, taking into account changes in their properties and geometric parameters in the manufacturing process;

- creation of a multi-layered fabric by putting layers of wool fibers on the base, which is used as a printed chiffon fabric;

- in expanding the prospects for the development of textile design when creating unique models of clothing made of felt.

Experimental studies were conducted in the laboratory of the Fashion House "Asyl - design". The practical significance of the obtained results lies in the development of:

- technologies for manufacturing printed products of volumetric shape from multilayer felt cloths;

- expansion of the range of products made of felting materials, characterized by the originality of the artistic and compositional solution of printed chiffon.

Results and discussion. The felting technique has been a life-determining factor for many nomadic people for centuries. This is a kind of applied art that has an extensive base of techniques and methods of execution and a promising prospect for its development. The topicality of the research topic is also due to the fact that modern Kazakhstan is experiencing a period of national revival. The work is aimed at reviving traditional craftsmanship, searching for a method of obtaining a unique material, as well as improving the felting technique. The spread of felt craft on the territory of Kazakhstan is not accidental, because the Great Kazakh Steppe hosted caravans of the Great Silk Road in the oases of its cities and villages for many centuries. This has caused the nomads to be proud of their historical achievements, such as mobile, portable home made of felt (yurts), riding clothes, leather and felt products. The naturalness, environmental friendliness, lightness and practicality of felt, as well as the healthy properties of sheep wool are highly appreciated all over the world. The favourite material of nomadic people – felt, has become one of the most relevant and modern today [7,8].

In the well-known technologies of nunofelting, a template method is used for the

manufacture of various types of clothing, limiting the possibility of choosing a certain model. The method of obtaining a multilayer canvas, described by the author Shinkovskaya K.A., is widely known, according to traditional technology, the decor of the canvas is composed fragmentally, when its layout is fulfilled in advance, taking into account the shrinkage coefficient of 30% [9...11].

In the presented work, the production of multilayer fabrics based on a nunofelting fabric to create unique models consists in creating them by putting layers of wool fibers on a base as which a printed fabric is used.

Printed fabric is a fabric, the author's drawing of which is applied by sublimation printing [12], and the size of the fabric is selected in accordance with the selected model. Then the wool fibers are laid out in layers, the number of which depends on the selected assortment. Next, the roll, drying and wet-heat treatment is carried out on the resulting canvas. Such an introduction makes it possible to obtain a multi-layered fabric convenient for standard cutting methods, as well as to produce it at any time of the year, increasing its plastic properties, diversifying its texture, color scheme and artistic and compositional solution of the pattern. Carefully selected printed fabrics are used for the proposed method of manufacturing multilayer fabrics, depending on the design project. The best option is light fabrics with a "loose" structure (silk, chiffon, linen, viscose, cotton, etc.). Initially, chiffon is printed on sublimation equipment and the layout of the future product is laid in the fabric pattern, taking into account the shrinkage coefficient. The size of the used printed chiffon corresponds to a width of 1 m. 48 cm. and a length of 2 m. 50 cm, as shown in Photo 1.

The shrinkage coefficient of the presented method is 30%. This felting technique involves laying out wool, taking into account shrinkage and processing. The choice of the method and the quality of the layout depend on the tone and length of the wool fiber, its uniformity, the preparatory passed processes and the skill of the performer. Then the wool fibers are laid on printed chiffon and the process of wet felting is carried out. The intro-

duction of a regular longitudinal-transverse layout during "wet" felting made it possible to control the thickness of the fabric being manufactured and achieve a unique fineness without significant loss of strength. The presented technique of "nunofelting" can be enriched by the insertion of various printed materials, which contributes to the enrichment of the color palette and the variety of texture of canvases.



Photo 1

The peculiarity of the fabrics selection for the nunofelting technique is the use of a discharged cloth according to the structure, which provides fast and easy rolling. When viewed through the lumen, small holes are visible, for example, as on gauze or discharged silk.

Chiffon is a completely smooth and even material, so it is used in felting. In the experimental work, printed chiffon with the "crash" effect was used. The use of printed chiffon with a "loose" structure allows you to get a thin, smooth, homogeneous and bright fabric, which allows you to make the canvas dense and plastic [13].

Chiffon is printed on sublimation equipment and the layout of the future product is laid in the fabric drawing, taking into account the shrinkage coefficient. The composition of the drawing can be on any subject, in this case in an ethno-style. The size of the printed chiffon used corresponds to a width of 1 m 48 cm and a length of 2 m 50 cm. The shrinkage coefficient of the presented method is 30%. The shrinkage coefficient can vary between 30-50% depending on the material used (wool, chiffon).

Strands of wool is evenly spread out on the printed chiffon in 2-4 layers. 2-4 thin lay-

ers of wool are processed, laid out perpendicular to each other in order to get a homogeneous, light and dense fabric. The strands of the first layer are placed vertically, the second – horizontally, the third – vertically, the fourth – horizontally, etc. After the layout is completed, it is thoroughly moistened with warm (water temperature 40-45 ° C) soapy water, using a synthetic mesh and a covering cloth, which cover the layout from above.

After the compacted layout, the fabric is turned over to the front side (the side of the printed chiffon) and the chiffon is "rubbed" into the wool over the entire surface. In the process of work, chiffon and wool are firmly bonded due to the gradual introduction of strands of felt into the weaving of the fabric, where they cling on both sides of the canvas. The fibers must smooth out to penetrate the weave and then begin to absorb the fabric. When the chiffon "grabs" with the wool, soap is added, the product is turned to the other side and continued to roll. warm water is used (water temperature 40-45 ° C) at the initial processing stages. When hot water is used, the wool may fall off too quickly, without having time to absorb the fabric. Only when the fiber penetrates into the weave and the base of the chiffon, you can use hot water (water temperature 50-60 ° C) to speed up the stalling process.

After the chiffon "grabs" with the wool, the canvas begins finally to fall off: roll and toss. The finished canvas has the following appearance: chiffon firmly bonded with wool and "wrinkles" and folds appeared on it. The cloth is rinsed in warm (water temperature 30° C), and then in cold water and dried in a straightened form. Then they proceed to wet-heat treatment so that the surface of the canvas becomes even and smoother, after which the details of a certain product are cut. You can get up to four different models from size 44 to 54 from one ready multilayer canvas in "nunofelting" technique.

Multilayer fabrics obtained by the proposed method, respectively, and ready-made models are in great demand due to the original and unique texture of the fabric, high heat-protective and healing properties of natural wool, weight, as well as ethnic design [14].

The method of manufacturing multilayer canvases based on printed chiffon in the "nunofelting" technique expands the prospects for the development of textile design when creating unique clothing models. Knowledge of the using raw materials and the ability to embody artistic and technical techniques that form a constructive and ornamental plot solution make it possible to produce creations by felting, generating the phenomena of decorative and applied art, bearing a significant aesthetic load, enriching the subject environment surrounding of a person.

Conclusion. Thus, improving the quality of felted clothing requires taking into account the peculiarities of small-scale production of felting products, which makes it relevant to develop a scientifically based method of designing and manufacturing multilayer felt canvases with printed chiffon fabric, creating new images that reflect exclusively the author's understanding of shape, color and material.

The structure of the manufacturing process of multilayer felt cloths with printed chiffon fabric has been developed, including the acceptance of raw materials, the production of printed fabric, the preparation of the canvas, self-assembly, roll with pre-molding, final

roll, refinement of details, drying, finishing and their constituent elements.

A method has been developed for manufacturing a multilayer fabric with a 2-layer wool strand laid out on printed chiffon, which allows creating a thin nuno-cloth, while laying the number of layers of wool is carried out depending on the assortment being developed: in 2 layers - light, designed for a dress and blouse assortment and in 4 layers – dense for jackets and coats.

The proposed "nunofelting" technique was tested to obtain a multilayer canvas and manufacture of felt products using the example of models of women's jackets and coats. Currently, creative author's works with the use of felt are relevant in Kazakhstan, as decorative and applied art helps to preserve national identity. In collections of felt clothing, combinations of felt with other materials are used, creating unusual images, photo 2, shows models of the assortment of light clothing and photo 3 - the upper assortment group in "nunofelting" technique. The ability to combine modern trends, forms and materials with national patterns and ornaments gives rise to extremely interesting works. Felt products become the hallmark and brand of Kazakhstan.



Photo 2



Photo 3

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