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NEW SCIENTIFIC RESEARCH AND PRACTICAL DEVELOPMENT OF ORENBURG DOWN -KNITTING PRODUCTS' DESIGN

Abstract: The paper delivers a brief characterization of physicomechanical properties of down (size of a cross-section of separate fiber, color, the ability of fibers to form dense substance) and highlights their influence on the aesthetic and operational properties of products. The authors present the results of laboratory studies of the felt samples, confirming the expediency of using goats' down in the design of clothing for various purposes. As an example of designing felt clothes, a collection of children's clothes is considered with a detailed description provided. The paper suggests theoretical and methodological model for the design concept of Orenburg's down-knitting products in the process of designing collections of clothes with the use of the Orenburg breed goats' down. It also introduces a full review of the author's collection of products, for which a theoretical and methodical model of the design concept has been tested. The author's collection is evaluated in terms of compliance to the basic compositional and design features of the traditional products of Orenburg down yarn knitting trades with the use of a theoretical and methodological model of the design conception of products of Orenburg region down knitting trades. The paper concludes by revealing such a compliance of the collection to the Orenburg traditions.

Keywords: clothing design, Orenburg down yarn knitting works, art, and design analysis, a theoretical and methodological model of the design concept of products of Orenburg down knitting works.

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ДИЗАЙН ИЗДЕЛИЙ ОРЕНБУРГСКОГО ПУХОВЯЗАЛЬНОГО ПРОМЫСЛА: НОВЫЕ НАУЧНЫЕ И ПРАКТИЧЕСКИЕ РАЗРАБОТКИ

Аннотация: В статье рассматривается эксперимент по соединению оренбургского пуха, оренбургской «паутинки» с войлоком в различных техниках валяния. Приводится краткая характеристика физико-механических свойств пуха (тонина, цвет, валкость) и отмечается их влияние на эстетические и эксплуатационные свойства изделий. В тексте статьи излагаются результаты лабораторных исследований войлочных образцов материалов, подтверждающие целесообразность использования козьего пуха в дизайне одежды различного назначения. В качестве одного из примеров проектирования войлочной одежды рассматривается коллекция детской одежды и дается ее подробное описание. В статье предлагается к использованию в процессе проектирования коллекций одежды с применением пуха коз оренбургской породы теоретико-методическая модель дизайн-концепции изделий пуховязального промысла Оренбуржья. Дается полный обзор авторской коллекции изделий, на которой апробирована теоретико-методическая модель дизайн-концепции. С помощью теоретико-методической модели дизайн-концепции изделий пуховязального промысла Оренбуржья производится оценка авторской коллекции на предмет соответствия основным композиционно-конструктивным особенностям традиционных изделий Оренбургского пуховязального промысла. Выявлено соответствие коллекции оренбургским традициям.

Ключевые слова: дизайн одежды, Оренбургский пуховязальный промысел, художественно-конструкторский анализ, теоретико-методическая модель дизайн-концепции изделий пуховязального промысла Оренбуржья.

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Europeans' usage of animals' wool as a main material for the production of clothes, textile, and felted products has been known since 1500 BC. Nowadays household goods of various purposes are manufactured from wool and down of a large number of domestic and wild animals. First of all, this refers to samples-symbols of national culture, proven as well-known all over the world national brands such as English tweed, cashmere shawls, Peruvian Chulio hat, Russian felt boots — Valenki, Aran¹ or Irish knitwear, knitted articles with the Scandinavian décor style, made by Norwegian, Icelandic craftswoman.

The listed examples of costume elements are well-known fashion trends that have passed the test of time because they “continue the traditions of the compositional construction of the folk costume, in which functionality and construction are interconnected, plastic and decorative beginning” [1, p. 31].

In connection with the increased interest in environmentally oriented design over the last decades, to creating clothes based on traditional types of shaping and attitudes to materials, it seems to us quite reasonable to consider in this article the phenomenon of products from the Orenburg's goat breed made in the framework of the Orenburg's down-knitting works, and their design techniques.

Orenburg's down yarn knitting trades (ODYNT) — a famous Russian brand, which has its own traditions, its own quality standards. Products of the handcraft, as well as products of many other folk crafts (Khokhloma, Palekh, Gzhel, etc.), have characteristic and recognizable features vividly expressed stylistically. The main products of the handcraft are fluff knitted shawls (warm thick shawls and thin lacy “gossamers”).

The Orenburg's craft has three components that make it possible to differentiate its own craft goods from other products: unique local downy raw materials, spinning and knitting technology, composite features of shawl products. Orenburg goats' down is very soft, curved in waves and has no core layer. Shawls and warm clothes are made from the thinnest and sturdy yarn which is got from goats' down. In diameter, goats' down is similar to natural silk or rabbits' down. Its own size of a cross-section of separate fiber is comparable to cashmere fibers and is inferior in size of a cross-section of separate fiber and length only to goats' down of the Chinese breed (table 1).

¹ Aran islands — islands in Ireland; Aranese knitwear — knitted needles a cloth with a characteristic pattern — “braids” (authors' note).

Table 1 – Indicators of down`s quality of various goats` breeds

Goats` Breed	Length of a Downy Fiber	Size of a Cross-Section of Separate Downy Fiber
Orenburg Breed	50–60 mm	14–16 μm
Near the Don Breed	88–105 mm	13,6–22,7 μm
Altai Mountains Breed	80–90 mm	17–18 μm
Dagestanian Breed	80–90 mm	18–20 μm
Mongolian Breed	47,3–66,7 mm	13,69–16,05 μm
Chinese Breed	71 mm	14,01 μm

The unique properties of Orenburg goats` down are caused by geographic and climatic features — big temperature drops in the conditions of a sharply continental climate, strong winds, and also by Southern Urals` steppe grasslands with multi-species forage herbs.

Orenburg down is soft, elastic, has a small size of a cross-section of separate fiber and high evenness in thickness and length. These properties of downy raw materials determined all the best qualities of Orenburg shawls: lightness, softness, low thermal conductivity, i.e. high heat-shielding properties, beautiful appearance, wear resistance, high operational qualities, and the knitted manufacturing method ensured its plasticity and drapability. A comparatively small length of fibers of goat` down provides the short even coating of down which is not hiding an openwork knitted pattern.

Colour of down depends on a pigment which is contained in a cortical layer. The Orenburg`s down natural colours are grey and white.

Orenburg down, like all natural fibers, has a good hygroscopicity, has a good ability to be spun. It is very moisture capacious, has a little bigger ability to be turned into a felt unlike down of other breeds. By this caused its use in the production of high-quality sorts of hat felt. Unfortunately, the potential of such unique raw material as goats` down of Orenburg`s breed is not fully realized only in the production of knitted shawl products. At the same time, the global trend towards the environmental friendliness of the processes of design, production, and consumption focuses public attention on handmade things, traditional crafts, not only to such as embroidery, knitting. Making felt has become especially popular.

Making felt today went far beyond needlework, a large number of professional designers, for example, Claudy Jongstra, Anne Kyyro Quinn, Sas Adriaenssens, deal with design and manufacturing of felt products. Art objects, also wall panels, furniture, lamps have been created from felt, clothing designers have been making from felt their whole collections (Christine Birkle, Aya Bapani, etc.). Products, that are made of felt are in constant demand.

Felt from Orenburg goat`s down has a pleasant feel of cloth, better drapery with almost the same heat-protection properties, than any felt fabric of the same density of Merino wool.

As one of the possible solutions to this problem, we propose to consider a collection of children's clothing, that was made by the felt making method using goat`s down. It (collection) was developed at Orenburg State University`s Department of Design in the framework of scientific research regarding the formation of modern design principles for design objects, taking into account the typical regional ethnic, industrial, and other features.

The possibility of using goat`s down in the process of manufacturing products using the making felt method is confirmed by the results of laboratory studies conducted by the JSC “Central Research Institute of the Clothing Industry” (2014). In order to establish the

appropriateness of using elements from goat's down in the design of clothing for various purposes, two samples of nonwoven fabric (that were produced by making felt method) were provided to the laboratory to determine the air permeability and total thermal resistance.

Sample No. 1 is made of wool produced by the Trinity worsted factory "Australian Merino Light Blue". Sample No. 2 was made from Orenburg's breed goats' down of the natural colour that undergone combing, belonging to LLC "Guberlinskoye gene pool goats' raising farm", Certificate of Conformity No. 1558845. The surface density of the samples was 213 g / m².

Climatic conditions of the tests complied with GOST standard 10681-75 "Textile materials. Climatic conditions for conditioning and testing of samples and methods for their determination". Normative documentation used during the tests included GOST standard 12088-77 "Textile materials and products from them. Method for determining air permeability", GOST standard 20489-75 "Materials for clothes. Method for determining the total thermal resistance". The following results were received (table 2): samples No. 1 and No. 2 have insignificant discrepancies in terms of total thermal resistance and a significant difference (1, 3 times) in terms of breathability in favour of sample No. 2. This allows us to conclude about the best heat-shielding properties of the sample No. 2. Sample No. 2 gives a soft, silky feeling of cloth, has the grey colour of a pleasant natural shade, which indicates its high aesthetic qualities (aesthetic qualities were evaluated organoleptically) and allows to be recommended for product development for various purposes using the making felt method, which corresponds to the vogue eco-style direction in garments.

Table 2 – The results of testing materials' samples

№ of the item	Name of the indicator, unit of measure	Samples of materials	
		№ 1	№ 2
1	Drapeable, %	-	-
2	Air permeability, dm ³ /m ² •SEC	715	544
3	Total thermal resistance, m 2x° SEC/W (under conditions of natural convection)	0,229	0,218

Thus, based on the data about the absence in the assortment of felted products from goat down, results of laboratory studies of submitted samples fashion trends and creative intuition was developed a collection of children's clothes "Rambouillet". In the process of designing this collection, not only fashion trends were taken into account, but, first of all, the purpose (casual wear) and conditions of the intended operation (street, room) of developed products, physics and mechanical properties of raw materials (size of a cross-section of separate fiber, colour, ability to be turned into a felt) and features of production technology by the felting method (the possibility of making seamless models and models with a minimum number of seams).

The collection consists of 4 shoulder products (two belong to outerwear, two belong to the costume-dressing group of the assortment) for girls of the preschool age group, made by the felted method and intended for everyday wear during the autumn / spring-winter period (figure 1).

The range of the collection includes a cape, coat, jacket, and dress. Products are made using the technique of wet felting from goats' down and Australian merinos' wool.

Main shades of the collection are severe white, grey and blue. In the colour scheme of the collection, the law of nuance is in force, and in the light brightness solution, it is the law of contrast. Particular attention in the organization of colour composition was paid to the arrangement of dark and light spots, their configuration and size, as well as their proportionality for each individual model, and when looking at the collection as a whole.

Perforation of the felted canvas, appliqué of openwork felt elements, the ornamentation of the product, obtained in the process of felting, are used as a decorative finish.

Model number 1 is a two-tone grey-white cape trapezoidal silhouette, with a hood and a buckle on the buttons. At the bottom of the item and the edge of the hood, the cape is trimmed with large white festoons; on the front parts and back, there are large openwork white elements, which are integrated into a product during a felting. The cape is made of goats' down, as white trim is used sheep's wool. The composition of the cape is subordinated to the general principle of the compositional construction of the collection models — the contrasting combination of dark and light colours, the presence of broad horizontal partitionments.

Model No. 2 is a two-tone grey-blue coat with a straight silhouette with button closure, a lowered shoulder line, a sleeve with a lapel, and a decorative felted collar of a fantasy shape. The coat has a visual horizontal partitionment along the upper part line into the grey (goats' down) and blue (Australian merino's wool) parts. Details of the collar are decorated with appliqué — openwork ornaments of white felt.

Model No. 3 — a seamless jacket of a straight silhouette, with felted sleeves of grey-white colour, has a central fastener on the buttons, with a felted stand-up collar. Visually divided into three parts: two white and grey, the transition from one colour to another goes through blue, creating the “effect of degrade”. The bottom of the jacket has a scalloped edge and is perforated. Picture of perforated elements is a reduced copy of drawings on the cape and coat. The jacket is made of goats' down, sheep wool is used as white and blue decoration.

Model number 4 is a white felted dress of a trapezoidal silhouette made from Australian merino sheep's wool, without a collar, with a short sleeve-kimono. It is decorated with a large appliqué — openwork ornaments of blue felt, repeating the pattern of a cape, coat, and jacket.

The collection “Rambouillet” as one of the test samples is an example of possible variation of the assortment of clothes from goats' down and the specific properties of Orenburg's goats' down to be used in the design of clothes, expanding the range of existing products.

Since the end of the twentieth century and to the present (the last 20 years), clothes made by various manufacturers based on Orenburg's fluff shawls or with use of fragments of fluff shawls and gossamers have gained wide popularity. This was also made possible because of the activities of well-known Russian fashion designers (Valentin Yudashkin, Anna and Alexei Borodulina, Yuliya Seryogina, Anastasia Romantsova).

In the conditions of absence of methods of designing clothes with use of goat's down and Orenburg's fluff shawl clothing models for quite a long time were created on the basis of creative intuition. Unfortunately, such products do not always comply with the traditions of the handcraft, including the fundamental compositional and constructive principles.

Also, there are no design proposals on the market for combining Orenburg down, the Orenburg's “gossamer” with felt in various felting techniques. Continuing the experiment to expand the use of goat down and as one of the possible solutions to this problem, we propose to use in the process of designing and evaluating a product or a collection of products for compliance with the traditions of the ODYNT a theoretical and methodological model for the design concept of products for the down yarn works of the Orenburg region (TMM). This

model has been developed at the Department of Design of Orenburg State University on the basis of art and designing analysis (ADA) of 337 shawl/ kerchief handmade and machine-made assortment during the past 100 years. TMM represents the list of the main composite elements and the means that can be met in classical production of the handcraft, and has the form of a chain from 22 positions: geometric shape (rectangle) → geometric shape (triangle) → division lines in direction (vertical) → division lines in direction (horizontal) → division lines by character (curvilinear) → division lines by character (rectilinear) → division lines by character (unbroken) → division lines by type (constructive-decorative) → rhythm, expressed decorative (straight uniform) → rhythm, expressed constructive-decorative (direct uniform) → rhythm, expressed structurally decorative (smooth continuous straight uniform) → symmetry (expressed structurally decorative) → asymmetry (expressed constructive-decorative) → base material colour (white) → the colour of the decorative finish (white) → the colour of the decorative finish (grey) → colour decorative finishing (warm) → contrast (in the direction of the lines) → nuance expressed in lightness → identity (in the direction of the lines) → proportional divisions (“Golden Ratio”) → composite accent, expressed constructively decorative. It should be noted that for the creation of design products, in which concept the principles and traditions ODYNT lay down, a full match with the elements of the presented model is desirable, but not necessary. Combinations of ADA positions can be arbitrary, leaving room for the designer's imagination.

For the purpose of approbation of the offered model and on the basis of the data obtained as a result of the analysis of the range of products made with use of goats' down of Orenburg's breed at the Department of Design of Orenburg State University has been developed a collection of elegant clothing “Violet” (figure 2).

The collection is developed as an experiment on a compound of felt and Orenburg's “gossamer” for the purpose of expansion of the range of the fluff products made on the handcraft and considering original culture, features, and possibilities of Orenburg region. Felt products are produced in various methods: wet felting, dry felting, nuno felting (felting on silk).

During the process of designing this collection was taken into account not only the source of inspiration (woman-“flower” 50-is of 20th century), but, first of all, the purpose (elegant clothes), as well as the physical and mechanical properties of the raw materials (size of cross-section of separate fiber, colour, the ability of down and wool fibers after exposure to high temperature, humidity, and some chemicals, closely intertwine, forming a dense mass) and features of manufacturing technology by the felting method (the possibility of making seamless models and models with a minimum number of seams In accordance with the purpose, the main function of the collection that has been developed was aesthetic [3]. This allowed the authors not to limit themselves in the process of work with the utilitarian framework for the operation of future products and to create complex, “rich” models in terms of decoration.

Collection “Violet” is 5 ensembles of elegant women's clothing for the youth group of consumers. The model range of the collection includes jackets, skirts, pants, blouse, corsage, dress. The collection is complemented by handmade accessories made of felt: hats; hairpins with boutonnieres of felt flowers; belts made of felt; bags made of felt, decorated with “gossamer's” fragments and bouquets of felt flowers.

Main colours of the collection are blue, austere white, mint green, pink and lilac, purple. The colour range of the collection is based on a combination of both similar and contrasting shades of colour and lightness.

A significant compositional technique of the collection is the use of traditional Orenburg's down shawl ornament (zigzag ornament on a blouse, zigzag ornament and rhombic pattern on a white chiffon skirt and dress), as well as fragments of the shawl.

Model number 1 (figure 2 B) is a felted ensemble of blue-white colour from a jacket and skirt. Jacket of the fitted silhouette, with the lowered line of a shoulder, a long sleeve, the central fastener on buttons, a bottom of a sleeve and a bottom of a jacket are trimmed by a white flounce which passes into a flounce collar, the border of transition of blue colour to white is decorated by strands of down yarn that enhances "effect of degrada", typical for multi-colour felt products. The back of the item and the frontal part of the armhole of the item are trimmed with a fragment of white colour gossamer. The half-circle skirt is ankle-length; the bottom is trimmed with a wide white stripe and a white downy thread by analogy with the jacket. The ensemble is made using the technique of wet felting; the gossamer is connected to the product manually (by sticking) according to the principle of dry felting.

Model No. 2 (figure 2A) includes a mint-coloured felt jacket and purple "cigarette" pants. The jacket has a fitted silhouette, with a short sleeve-kimono, and a central fastener on the buttons. The bottom of the jacket and sleeves are trimmed with a white flounce, which turns into a flounce collar, the transition border of green to white is decorated with threads of downy yarn, and the edges of the flounces have a pink tint. The back and sides of the item are trimmed with a pink-lilac gossamer fragment. Narrow trousers are ankle-length and trimmed with pink-lilac gossamer inserts at the bottom.

Model number 3 (figure 2B) consists of a light blouse and a violet-white two-tone skirt. Silk blouse straight silhouette with a V-neck, with a flap, a lowered shoulder line, wide sleeves $\frac{3}{4}$, assembled with an elastic band, decorated with a wavy pattern of wool and white downy yarn thread. The ornament repeats the configuration of the serrated edge of the gossamer and is located at the neck, armhole, and sides of the item. The technique of decorative trimming — nunofelting. A narrow purple skirt with a high waistline, double frill — "basque", with a length of mid-calf is trimmed at the bottom with a fragment of white gossamer. The lower Basque is also a fragment of the border of the white gossamer. The ensemble is complemented by a yellow hat with flowers and a belt made of mint-coloured felt, which gives dynamism and playfulness to the image.

Model number 4 (figure 2B) is a two-tone dress of an X-shaped silhouette, cut off along the waistline, with a narrow-fitted bodice and a wide puffy skirt, with a square neckline, short sleeves-kimono and a basque along the waistline. The white dress on the back, the sides of the bodice, the sleeves is trimmed with a pink-purple gossamer. The central part of the bodice and skirt, as well, as the bottom of the item have a decorative trim of wool and downy thread of pink colour. The ornament repeats the configuration of the serrated edge of the gossamer and its rhombic pattern. The technique of decorative decoration — nunofelting. The dress is complemented with a belt of bright lilac felt.

Model number 5 (figure 2G) is an ensemble of two-tone felt corsage and a puffy white skirt. Felted corsage of dark blue colour is trimmed on the top and bottom with a double white flounce, on the front part of the item the flounces pass along the lines of relief seams. Lower flounce is a fragment of the gossamer. The half-circle skirt is ankle length and decorated with an ornament of wool and white downy thread. The ornament repeats the pattern of a gossamer and is located on the entire surface of the item. The technique of decorative trimming is nunofelting.

With the aim of obtaining the characteristics of the compositional and structural arrangement of the models in this collection, as well as to check its conformity with the basic

compositional principles and traditions ODYNT, was produced the art and design analysis (ADA) using the method of Saveelyeva I. N., Doctor of Art History, developed by the All-Russian Research Institute of Technical Aesthetics for the study of objects of national and modern clothes [2]. Earlier only various authors' products created on the basis of personal creative experience without any methodical recommendations to the design of models with use of goats' down of Orenburg's breed [4] were undergone to a similar procedure.

ADA included the following positions: geometric view of the form, varieties of lines of divisions in the direction, appearance, nature, types of rhythms in different expressions, symmetry-asymmetry of the composition solution, colour, the law of contrast-nuance-identity, proportional relations, compositional accent, its location and the form of its expression (77 positions) [4]. The fragment of the list of positions is presented in symbols to figures 3, 4.

The following results were received.

In contrast to the rectangular shape of downy shawls, the "Violet" collection is dominated by the clinging silhouette form (44%), as well as a combined (22%), which is a combination of a tight bodice and an expanding bottom, which most corresponds to the style of the 50s of the twentieth century.

Also, as well as in the composition of shawls products, in the composition of models of a collection horizontal lines of partitionings (78%) due to horizontal arrangement of the decorative finishing including or imitating a border of fluff shawls most often meet. The effect of horizontal partitionings is also amplified by the existence of one — and multi-layered flounces.

In models of a collection straight lines (83%) continuous (89%) lines of partitionings as the simplest in processing and corresponding to Orenburg down yarn knitting shawls, ornamental lines prevail.

As well as in a classical shawls' product, in the "Violet" collection constructive and decorative lines of partitionings (72%) dominate as the most functional.

Unlike the shawls the composition of the collection models is based on smooth continuous straight, evenly rhythms (78%), straight, evenly (28%) и radial and ray, (17%) rhythms of decorative nature (flounces, zigzag shawl border, and ornament "gossamer"). Constructive-decorative rhythms typical for the products of the craft are also quite common in collection models: radial and ray, straight, evenly (39%) and smooth continuous based on straight evenly lines (33%). This is mainly due to the design of the bottom of products, necklines, sleeves, flounces, and fragments of "gossamer".

As well as in shawls, symmetry prevails in the given collection and carries constructive and decorative (100%) and decorative (100%) character.

Cool shades (67%) of turquoise, lilac, purple, achromatic white and a small amount of warm beige colour (11%) has been included in the colour gamut of basic materials, in accordance with the source of inspiration and fashion trends at the time of creating the collection. Despite the fact that the colour range of the collection has a cold gamut, rather than the white-grey achromatic that is characterized by shawls products the collection contains a large amount of white: 22% of the basic material and 78% of the decorative finishes are white, which corresponds to one of the main trends of the craft.

In models of the collection, by analogy with shawls products, the most common contrast is in the direction of partitioning lines (61%), but also the greater frequency of occurrence is a contrast in the form (56%), in the texture (50%) and in lightness (44%). The contrast in the direction of lines more is a consequence of horizontal arrangement of a decor regarding constructive and constructive and decorative lines of partitionings and uses

of openwork panels of downy shawls with their precise geometrical ornament. The contrast in shape is caused by the presence of volumetric details in narrow tight-fitting products (many-tier resplendent flounces, wide frills — basques, sleeves). The contrast of textures can be explained by the combination of various techniques of manufacturing of products: wet and dry felting, felting on silk (nunofelting), when next to the smooth surfaces of natural silk there are openwork fragments of “gossamer”, woolen felt, down thread.

The identity in shape (44%) is shown in multiple repetitions of many-tier flounces in finishing of various products of a collection.

In contrast to shawls products, most of the collection models are based on their proportional partitionings not “Golden Ratio”, but the arithmetic proportion (33%). This can be explained by the need for “adjustment” of the ornament of shawl products to the sizes and proportions of a human’s figure.

The composite accent in products of a collection is mostly often expressed decoratively (89%), constructive (72%) and in lightness (72%). This is caused by a large number of decor (fragments openwork gossamer, felted ornament), the presence of flounces, fantasy-shaped collars, the contrast between the dark colour of the main product and the light, often white colour of the decorative trimmings.

The numerical values of some of the above parameters can be visualized graphically (figure 2), where the blue line is the result of the ADA of the models of the collection, the numerical values of the frequency of occurrence in percent are marked on the vertical axis, and the positions of the ADA are indicated on the abscissa axis. Due to a big volume of the study and the limited format of this article, the graphical interpretation of the ADA results in Figure 2 is presented fragmentarily.

To determine the compliance of the collection with the traditions of craft, a chain of maximum values was determined in each of the groups of positions of ADA (figure 2, red line): geometric shape (tight-fitting) → lines of partitionings in the direction (horizontal) the lines of partitionings on the character (continuous) → lines of partitionings by the type (structurally-decorative) → rhythm, expressed decoratively (smooth continuous straight, evenly) → the rhythm of expressed structural-decorative (radial and ray on the basis of straight, evenly) → the symmetry (expressed decoratively) → the symmetry (expressed constructive decoratively) → colour of the main material (chromatic cold) → the colour of decorative trimming (white) → contrast (in the direction of the lines) → nuance expressed in lightness → identity (in form) → proportional partitionings (arithmetic proportion) → the composite accent expressed decoratively (15 positions).

At Figure 4 a fragment of a histogram is presented illustrating the results of combining positions of the theoretical and methodological model of the design concept of products of ODYNT (red columns) and the general ADA of the collection (blue columns). As the chain of maxima for a collection made 15 positions, and the chain of TMM has 22 positions, the chain of the smallest length is taken for 100%. Data show congruence of the maximum values of positions of an ADA collection to TMM chain elements on 7 indicators.

Congruence maximum values in each position group with TMM goes on 47% of positions; the results of ADA show us that the collection “Violet”, undoubtedly, is a continuation of the ODYNT traditions at the new evolutionary stage of its development. The tradition, in this case, is one of the components of the image. The collection completely corresponds to the stated appointment and in this sense is absolutely functional, performing the leading function — esthetic. The high artistic level of the collection is awarded diplomas and awards at prestigious costume design competitions.

Thus, the theoretical-methodological model of the design concept of products of Orenburg's down yarn knitting works has been proposed by us and on its basis, the collection of elegant clothing is developed using different felting techniques in combination with fragments of Orenburg's "gossamer". Successful testing of TMM has been carried out and its expediency has been revealed regarding the evaluation of products for compliance with the decorative craft traditions: the author's collection "Violet" corresponds to the traditions of Orenburg. TMM can be used as a tool for scientific proof of the belonging of new design developments to the traditions of Orenburg shawl/kerchief knitting, as well as a methodological guide to the design of products for a given purpose.

An experiment to create this kind of clothing contributes to resolving the contradictions between the innovative possibilities of the modern fashion design industry and their limited use in the production of domestic products; also, between the need to develop new variants of usage of raw materials of the Orenburg's region and the insufficient highlighting of this problem in design theory and practice.

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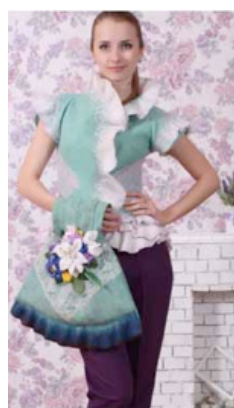
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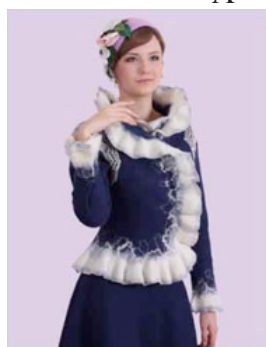
Рисунок 1 – Коллекция «Рамбулье», авторы М. М. Яньшина, М. Свиридова
Figure 1 – “Rambouillet” collection. The authors M. M. Yanshina, M. Sviridova



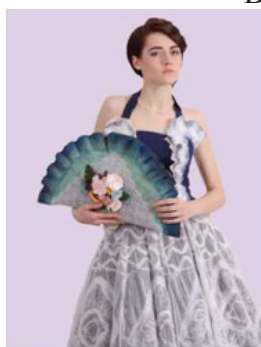
А



В



С



Д

Рисунок 2 (А, Б, В, Г) – Коллекция Violet, авторы М. Яньшина, Ю. Лежнина
Figure 2 (A, B, C, D) – “Violet” collection, authors M. Yanshina, Yu. Lezhnina

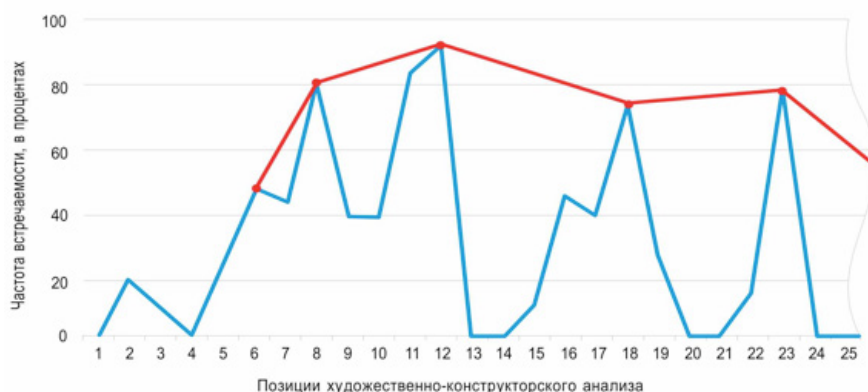


Рисунок 3 – Фрагмент графического представления результатов художественно-конструкторского анализа коллекции Violet.

Линия синего цвета — результат художественно-конструкторского анализа коллекции Violet, линия красного цвета — цепочка максимальных значений в каждой из групп позиций художественно-конструкторского анализа коллекции Violet

Figure 3 – The fragment of a graphical representation of the results of artistic and design analysis of “Violet” collection.

The blue line is a result of artistic and design analysis of the “Violet” collection, the red line is the chain of maximum values in each of the groups of positions of artistic and design analysis of the “Violet” collection

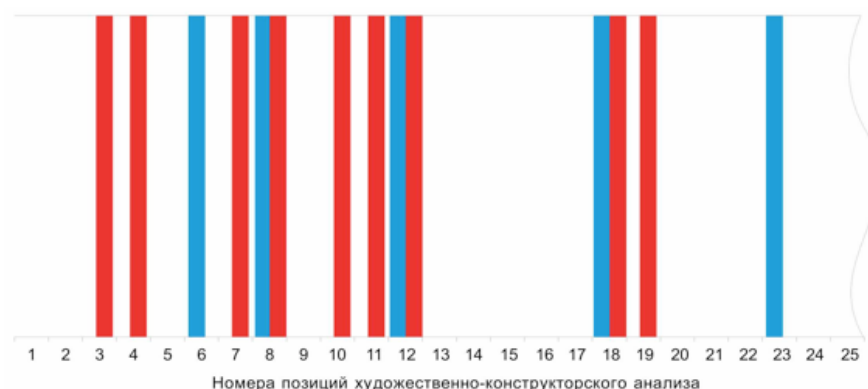


Рисунок 4 – Фрагмент графического представления результатов совмещения цепочки позиций теоретико-методической модели дизайн-концепции изделий Оренбургского пуховязального промысла и цепочки максимальных значений художественно-конструкторского анализа коллекции Violet.

Столбцы красного цвета — цепочка позиций теоретико-методической модели дизайн-концепции изделий Оренбургского пуховязального промысла, столбцы синего цвета — цепочка максимальных значений в каждой из групп позиций художественно-конструкторского анализа коллекции Violet

Figure 4 – Fragment of a graphic representation of the results of combining a chain of positions of theoretical and methodological model of the design concept of Orenburg down-knitting trades' production and a chain of maximum values of artistic and design analysis of the “Violet” collection.

Red columns represent the chain of positions of theoretical and methodological model of the design concept of Orenburg down-knitting trades' production, the blue columns representing a chain of maximum values in each of the groups of positions of artistic and design analysis of the “Violet” collection

Условные обозначения к рисункам 2, 3

Геометрическая форма изделия:

- 1 овальная;
- 2 комбинированная;
- 3 прямоугольная;
- 4 треугольная;
- 5 трапеция;
- 6 прилегающая.

Линии членений по направлению:

- 7 вертикальные;
- 8 горизонтальные;
- 9 наклонные.

Линии членений по характеру:

- 10 криволинейные;
- 11 прямые;
- 12 сплошные;
- 13 прерывистые;
- 14 зигзагообразные;
- 15 волнообразные.

Линии членений по виду:

- 16 конструктивные;
- 17 декоративные;
- 18 конструктивно-декоративные.

Ритмы, выраженные декоративно:

- 19 прямой равномерный;
- 20 пропорционально-последовательный;
- 21 радиально-лучевой прямой равномерный;
- 22 радиально-лучевой пропорционально-последовательный;
- 23 плавный непрерывный прямой равномерный;
- 24 плавный непрерывный пропорционально-последовательный.

Legend to figures 3, 4

Geometrical form of the product:

- 1 oval;
- 2 combined;
- 3 rectangular;
- 4 triangular;
- 5 trapeze;
- 6 clinging.

Lines of partitioning in the direction:

- 7 vertical;

- 8 horizontal;
- 9 inclined planes.

Lines of partitioning according to the character:

- 10 curvilinear;
- 11 straight
- 12 continuous;
- 13 intermittent;
- 14 zigzag;
- 15 wavy.

Lines of partitioning by the form:

- 16 constructive;
- 17 decorative;
- 18 constructive and decorative.

The rhythms expressed decoratively:

- 19 straight, evenly;
- 20 proportional and consecutive;
- 21 radial and ray, straight, evenly;
- 22 radial and ray, proportional and consecutive;
- 23 smooth continuous straight, evenly;
- 24 smooth continuous proportional and consecutive.