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USING THE PRINCIPLES OF TRANSFORMATION IN THE DEVELOPMENT OF NEW DESIGN CLOTHES-MAKING FOR WOMEN

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Abstract: *The transformable garments represent an actual group in the assortment of contemporary clothing, providing wide possibilities of obtaining multifunctional shapes. The work presents the results of theoretical and applied research in the design of garments with flexible structure for women. The scope of study consists in the analysis of possibilities to develop modern assortments of garments for women by using morphological transformation techniques. The transformable products include an ensemble of garments designed with diverse techniques and methods, both traditional and non-traditional. The morphological transformation techniques are based on the principles of reconstruction and transformation, facilitating the transformation of one product shape into another and transformation of elements in the interior of the same shape. The study has defined several development directions for transformable products in the actual wardrobe: products made with two different texture, color and structure faces; products with attachable or detachable elements; products with a separate structure that by location, wrapping or connection of elements allow to obtain diverse shapes; products with changing shapes with the aid of various types of accessories; multifunctional product elements. The experimental studies were aimed at the elaboration of assortments of garments for women by applying the morphological transformation procedures with elaboration and manufacturing of models of transformable skirts for women. The transformable models demonstrate the universality of products, their functional possibilities, capacity to change the external appearance and aesthetic properties. When designing women's skirts one may use all types of transformation, several types of transformation may be used in one product simultaneously thus achieving several functional scopes.*

Key words: *transformable garments, transformation procedures, multifunctional shapes.*

1. INTRODUCTION

The transformable garments represent an actual group in the assortment of contemporary clothing, providing wide possibilities of obtaining multifunctional shapes. [1] The transformable products include an ensemble of garments designed with diverse techniques and methods, both traditional and non-traditional. The morphological transformation techniques are based on the principles of reconstruction and transformation, facilitating the transformation of one product shape into another and transformation of elements in the interior of the same shape. [2] The transformable garments are elaborated in order to satisfy the requirements imposed by the dynamic lifestyle, determined by the rapid change of functional processes and intense rhythm of events. [3] The

morphological transformation technique plays an important role in the process of creation of a spatial shape of contemporary garments. [4], [5]

The scope of the study consists in the identification of development directions of the assortment of modern garments by applying the morphological transformation techniques for creating garments for women.

2. TRANSFORMABLE PRODUCTS IN ACTUAL TRENDS

The transformable products are now occupying a special place in the fashion trends, they are included in the collections of the designers *Hussein Chalayan, Yohji Yamamoto, Martin Margiela, Gareth Pugh,* etc. One may also mention the products of the Italian brand *Loro Piana* - topcoats with two faces, cardigans, fur and tricot jackets; the products of *Rachel Rachel Roy* 4 in 1 – demi-coat, jacket, dress and topcoat, the component elements are affixed or detached as the case may be; the transformable products of *Donna Karan* allowing to obtain various shapes by installation, winding or connection of elements; the products of *PennyBlak* – jacket-type products with detachable elements – the lower part of product, hood, the sleeves, the thermal isolation undercoat and the additional reference elements made of fur; the products of *Jolier* - two models of dresses with shapes modified by tacks - at terminations and sleeves, or double-face products made of materials with different texture and color. [6]

Analyzing the assortment of transformable garments one may determine certain *development directions for the transformable products in the modern wardrobe* [7]:

- The products are made of two different types of fabric with different texture, color, structure and may be worn on one side or another depending on occasion,
- The products have attachable or detachable elements allowing to obtain several types of modification variants for the same type of product,
- The products have a separate structure (integral structure with a minimum number of seams, mad of elastic materials) that by fixation, winding or connection of elements allow to obtain diverse shapes,
- The products with changing shapes (length, expansion degree, etc.) using diverse types of accessories (zippers, buttons, tacks, lacing, etc.),
- Elements of multifunctional products.

3. CLASSIFICATION OF METHODS AND PRINCIPLES OF TRANSFORMATION OF WOMEN'S GARMENTS

Some techniques of constructive-technological and composition solutions of morphological transformation of garments and their elements were elaborated during many centuries. Morphological transformation is a tool used for conferring a functional universality to the product.

The leading specialists in transformable clothing have worked out twelve prototypes of morphological transformation joined into nine basic principles [3,5]:

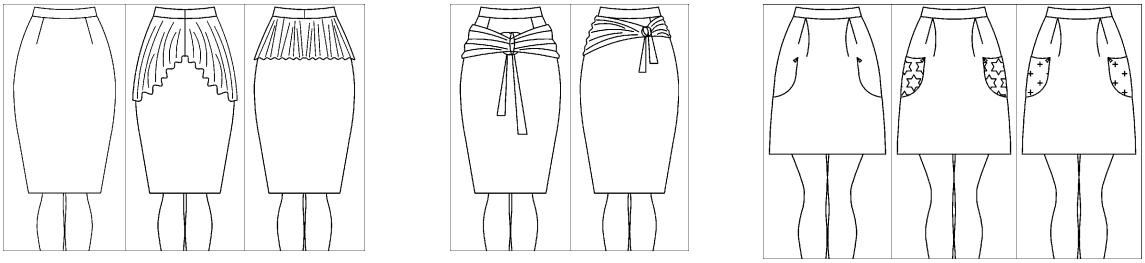
1) „substitution" of parts or elements of product by other parts or elements;
2) „detachment-attachment" of parts or elements;
3) „adjustment –fixation" of size, volume and shapes of product parts;
4) „stretching – compression" of parts or elements;
5) „wrapping-unwrapping" of parts or elements;
6) „disappearance-appearance" of volume of entire product;
7) „combination – insertion" of parts;

8) „orientation”;
9) „recombination” of parts or elements of products.

4. ELABORATION OF THE ASSORTMENT OF WOMEN'S SKIRTS BASED ON THE TRANSFORMATION TECHNIQUES

The design of new models of garments is a complex solution of image formation; it is a process combining the solution of artistic, technical, ergonomic, technological and economic tasks. When designing new models of women's skirts it is important to improve and enlarge the assortment based on the development and improvement of transformation techniques. For this purpose, the method of morphological analysis has been chosen in order to find new solutions for transformable women's skirts and select the best possible options taking into account the available tools and methods of executing new models of transformable women's skirts. For a more efficient usage of transformation techniques when designing models and constructions of women's skirts, as well as when compiling the wardrobe one need to systematize the constructive solutions of transformable elements.

The „substitution” transformation type is based on the substitution of some elements or constructive modules with other ones with preservation of basic elements, not all the modules being used simultaneously. For this type of transformation, the theory of combinatory analysis is used and the principle of different resistance levels of used parts. The location of substituted elements and their variants may be different. So, one of the many variants of this type of transformation may be the straight skirt with different types of belts substituted with others of different color, texture or construction. On the figure 1 one may consider the models of skirts elaborated based on the "substitution" morphological transformation principle. The model 1 (fig. 1,a) represents the basic skirt of narrowed silhouette and longitudinal junction. The shape is made on the account of lateral seams and waist darts, with three seams, with a zipper at back. The skirt ends at the knee level. The essence of transformation process in this model consists in the replacement of detachable upper frills of different shapes. The model 2 (fig. 1,b) – the essence of the transformation process in this model consists in the substitution of belts of different shapes. The model 3 (fig. 1,c) is a women's skirt of trapezoid silhouette, longitudinal junction. Its shape is made on the account of lateral seams and waist folds; it has three seams and a zipper at the back. The skirt ends above the knee level. The essence of transformation process in this model consists in the replacement of detachable pockets of various trimming patterns. The transformation tool here is the zipper on the frontal side of skirt.



a *b* *c*

Fig. 1: *Models of skirts elaborated in accordance with the „substitution” morphological transformation technique.*

Below one may consider some variants of applying the „detachment-attachment” transformation type in the manufacturing of waist-zone garments for women. This type of

transformation is based on the detachment or attachment of constructive-decorative or decorative elements of a multifunctional wardrobe. It allows improving the aesthetic properties of products and modifying their external appearance, thus making the wardrobe more varied at minimum cost. In this case one will use the principles of the theory of decomposition of construction, disassembly into details, and division into component elements. Detachable elements of products may be made of different materials. The conducted analysis allowed outlining the following solutions for the location of detachable elements: attachment as a flounce to the lateral seam of basic product; attachment of flounce into the curve junction line of front cloth, attachment of flounce over the front cloth of skirt. The attachment of detachable elements to the basic product in the place of basic fixation may differ and may use the buttons, zippers, etc. Different options are possible for the second solution of problem –both for junction lines and additional fixation of detachable element. On the figure 2 one may consider the models of skirts elaborated in accordance with the «detachment-attachment» morphological transformation technique. The model 4 (fig.2,a) – the essence of the transformation process in the model consists in the detachment-attachment of decorative element, specifically of the decorative flounce using the zipper under the belt. The model 5 (fig. 2,b) – the essence of the transformation process in this model consists in the detachment-attachment of decorative element – specifically - of the decorative flounce using buttons on the left side of the frontal cloth of product. The model 6 (fig.2,c) – the essence of the transformation process in this model consists in the detachment-attachment of decorative element – flounce – using a zipper on the front cloth of skirt. There is a junction curve on the front cloth of product with a seamed-in zipper. The zipper has a decorative and functional destination, being also a transformation tool. The model 7 (fig. 2,d) – the essence of the transformation process in this model consists in the detachment-attachment of decorative element – flounce – using a zipper on the lateral seam of skirt. The model 8 (fig. 2,e) – the essence of the transformation process in this model consists in the detachment-attachment of decorative element – flounce – using the buttons on the inner side of lower edge of skirt.

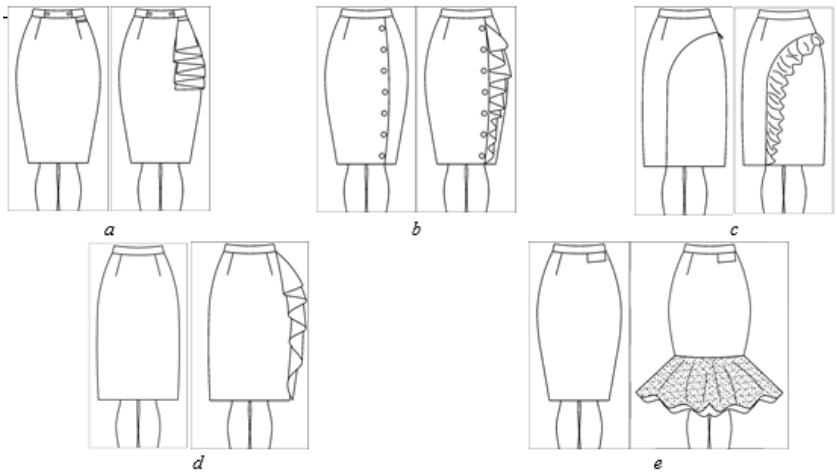
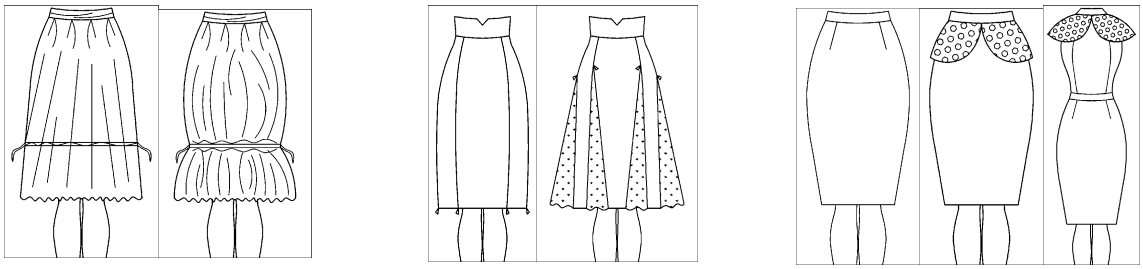


Fig. 2: *Models of skirts elaborated based on the „detachment-attachment" morphological transformation technique.*

The „adjustment-fixation" transformation is done by changing the volume, shape and other characteristics of products or constructive element (fig.3a, b). Transformation is done using special elements: zippers, links and lacing. The variants of constructive solutions for waist garments in this kind of transformation are the non-elastic constructive-decorative inserts into the element junction seams with volume adjustment possibility; design of main element with possibility to adjust the size;

free adjustable assembly. The location of free adjustable assembly may be different. It may be located in the upper part of the product over the entire perimeter; only on the front part of product; only in the area of lateral seams, in the lower part of the product over the entire perimeter. In order to reduce the volume one may use a band inserted into a superimposed coulisse. As an alternative, one may pass a band or a lace through eyelets. The model 9 (fig.3, a) – Women's skirt of trapezoid silhouette, longitudinal junction, the shape is made by «sun»-type cut with folds on waist, three seams, one zipper on the back side. The skirt length is at the knee level. The essence of transformation process in this model consists in adjustment– fixation of product volume. The volume adjustment tool is the decorative band in the coulisse installed in parallel with the lower edge of skirt. The model 10 (fig.3, b) – Women's skirt of straight silhouette, longitudinal junction, the shape is made on the account of lateral seams and relief elements located on the front and back of skirt. The skirt has three seams, with a zipper at back. The skirt length is at knee level. The essence of transformation process in this model consists in adjustment – fixation of product volume. The volume adjustment is done by zippers and wedges in the relief elements and lateral seams of skirt. When the zipper is opened, the skirt gets its volume.

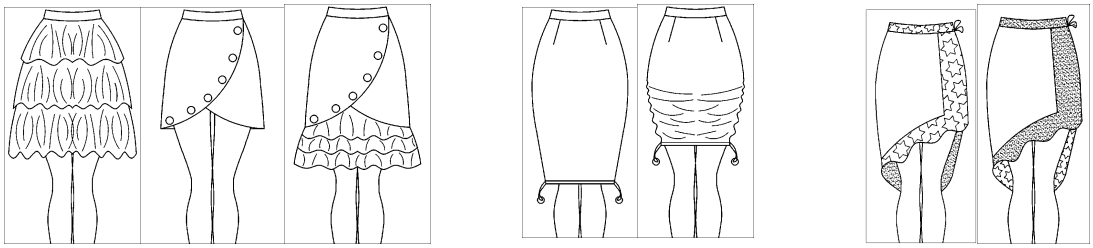


a *b* *c*

Fig. 3: *Models of skirts elaborated based on the „adjustment-fixation" morphological transformation technique a, b and of «recombination» technique - c*

The model 11 (fig.3, c) – Women's skirt of narrowed silhouette, longitudinal junction. Its shape is made by lateral seams and waist tucks, with three seams, with a zipper at back. The skirt ends at the knee level. The essence of transformation process in this model consists in the relocation of transformed element – upper frill that may be worn as a shawl over a dress or blouse. The upper frill is fastened on hooks.

The model 12 (fig.4, a) – Basic skirt of trapezoid silhouette, horizontal junction, the shape is made by gathered flounces, with a single seam, one zipper at back. The skirt length is above knee level. The essence of transformation process in this model consists in combination – insertion of one more skirt over the basic skirt, fastened on buttons. The second skirt may serve both as an auxiliary element and a separate product. Also this principle is called «matryoshka». The second skirt is a product of trapezoid silhouette, vertical junction; the shape is made on the account of lateral seams, three seams, with buttons on the front cloth. The model 13 (fig.4, b) – Women's skirt of narrowed silhouette, longitudinal junction, the shape is made by lateral seams and waistline tucks, three seams with a zipper at back side. The skirt ends at knee level. The essence of transformation process in this model consists in wrapping-unwrapping of length. The process is based on the coulisses provided in lateral seams. When the bands are tightened, the skirt length is wrapped. The model 14 (fig.4, c)– Women's skirt of straight silhouette, longitudinal junction, the shape is made by lateral seams and waistline tucks on the back side of skirt, the skirt has three seams and a wrap-over. The skirt ends at knee level. The essence of transformation process in this model consists in the orientation technique. The product has no face and no reverse side, the product is double-sided and double-colored.



a *b* *c*

Fig. 4: *Models of skirts elaborated in accordance with the morphological transformation procedures a – „combination – insertion", b- „wrapping-unwrapping" - b and c- „orientation"*

5. CONCLUSIONS

The use of transformation techniques and methods in elaborating women's garments is a perspective practice, since it allows to resolve a series of actual problems: to enlarge the assortment of products; to increase the number of products in the women's wardrobes without significant additional costs; to extend the product exploitation periods; to raise the universality, the functional possibilities and aesthetic properties of garments. When designing women's skirts one may use all the main types of transformation, several types of transformation may be used in a single product thus allowing to attain an entire series of objectives.

From their very first appearance and to these days the transformable garments have suffered significant changes, from draperied clothing to complex shapes and developed together with the wearers. However, they remained an unchanged attribute allowing to diversity and rationalize the volume of wardrobe and to point out the wearer's individuality. So, the transformable products may represent the future of garments.

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