



STUDIES ON THE POSTOPERATIVE FUNCTIONAL-ADAPTIVE BRA DESIGN

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Abstract: *The development of functional clothing products for people with disabilities is one of the priority research directions in the field of the textile industry. The paper presents the results of the comparative analysis of the basic patterns construction for the bra-type product in order to obtain a methodological basis for the design of the postoperative functional-adaptive bra rational ergonomic constructions. The theme timeliness is determined by the sudden drop in the quality of life of women with breast gland cancer after conducting radical surgical treatment. The work aims to obtain data on the ability to adapt the design algorithm of the basic patterns for the bra-type product to the functions, requirements and characteristics required for the post-mastectomy textile products in general and the postoperative functional-adaptive bra in particular. The paper mentions the problems faced by post-mastectomy women and the textile products role in their prevention. The study includes identifying the functions, requirements and characteristics needed for the post-mastectomy textile products, the development of the basic patterns constructions for the bra product, the comparative analysis of the made patterns. One of the problems that is tried to be solved in this paper is the methods identification of bra-type products design that allows the adaptation of the construction algorithm to the requirements and characteristics necessary for the post-operative bra product. The results of the study are recommended to be used in the process of developing the constructions of post-operative functional-adaptive bra type products for women wearing external breast prostheses.*

Key words: *Post-mastectomy textile products, requirements, functions, features, design method.*

1. INTRODUCTION

The fundamental problem of designing functional-adaptive clothing is obtaining the most advantageous shapes and sizes of clothing products in accordance with structural, functional, psychological peculiarities of the wearer; material properties; aesthetic and functional requirements needed for products.

The postoperative bra type product is recommended for women post-mastectomy but also in the case of other surgery on the breast gland, returning its role to prevent post-operative

complications, optimal support of the breast prosthesis, ensuring the state of physiological and psychological comfort. [1-3]

2. THEORETICAL ASPECTS

The scientific design of a clothing product requires its functional structuring, a process that at the initial stage involves identifying the functions, requirements and characteristics necessary for the clothing product.

Clothing products for post-mastectomy women require the assignment of specific functions that contribute to increasing the patient's satisfaction and their life quality (figure 1).

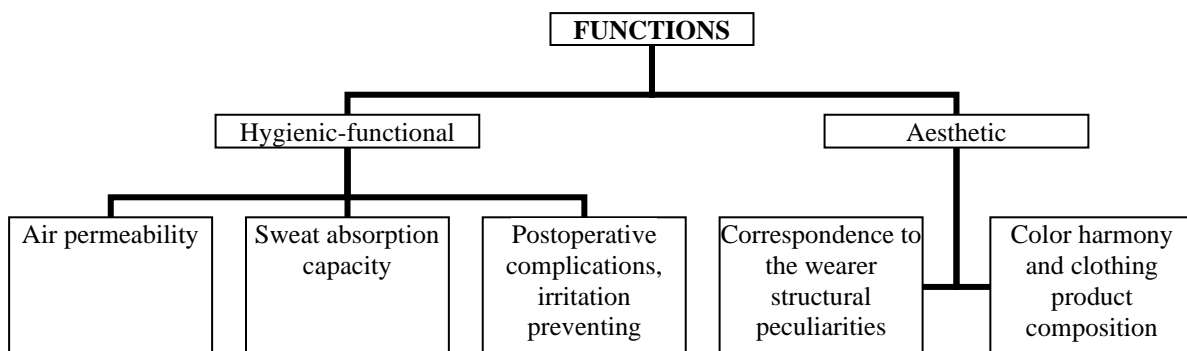


Fig. 1: Functions required for the post-operative functional-adaptive bra type product

The postoperative bra type product is characterized by a group of specific requirements dictated by the needs of the wearer and the functions necessary for this type of product (figure 2).

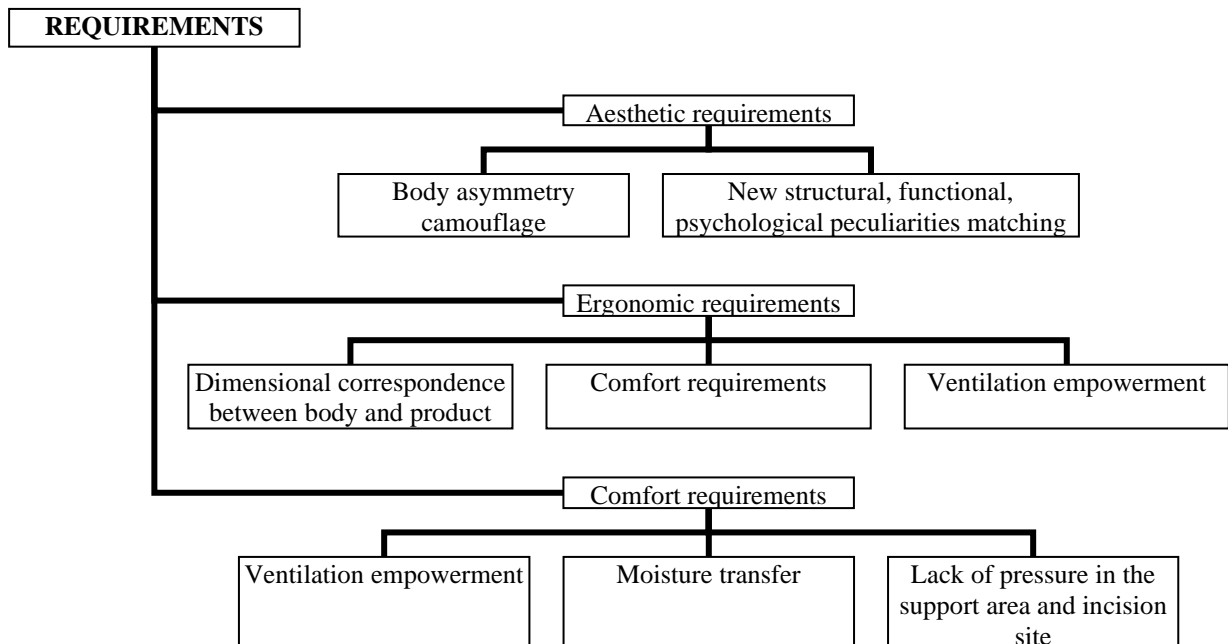


Fig. 2: Requirements for the post-operative functional-adaptive bra type product

The post-mastectomy bra type product is designed taking into account the possibility of complications in the postoperative and rehabilitation period. The specific characteristics required for the post-mastectomy bra are shown in Figure 3.

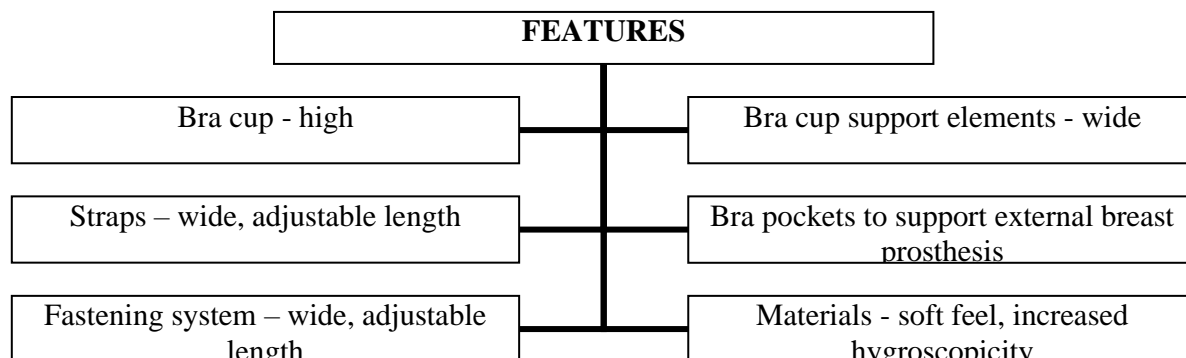


Fig. 3: Specific features required for the post-mastectomy bra

3. EXPERIMENTAL RESEARCH

While achieving the basic pattern construction it is necessary to solve the problem of ensuring the dimensional correspondence between the body and the product, by obtaining the constructive elements that correspond to the functions, requirements and specific characteristics needed for the type of designed product.

In order to obtain a methodological basis for the design of rational ergonomic constructions of the postoperative functional-adaptive bra, it is proposed to carry out some research, which at the initial stage include the analysis of existing methods of constructing the bra-type products patterns.

The paper presents the comparative analysis of the basic patterns of underwear items from the bra group, patterns obtained by various modern construction methods.

For this purpose, constructions of the basic pattern were made by 6 graphical-analytical calculation methods:

- English method Winifred Aldrich;
- French method Line Jaqe;
- method of construction in radial networks;
- method Muller&Sohn;
- method ȚNIIȘP;
- method of the Russian author L. Serova.

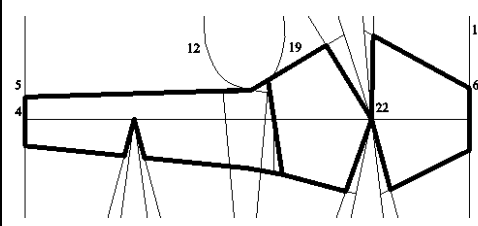
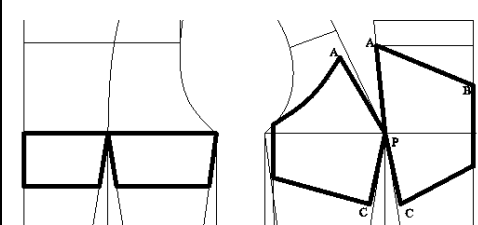
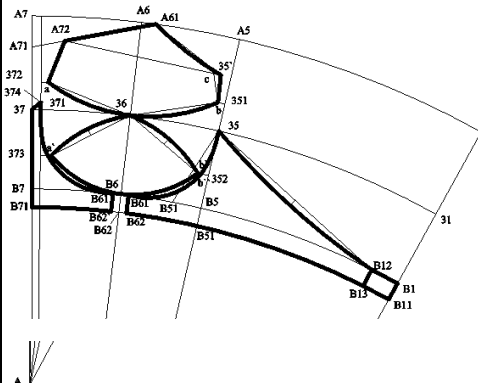
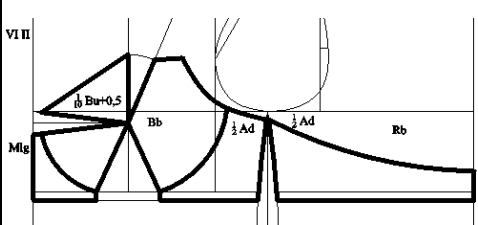
The selected methods differ from each other by the number of anthropometric dimensions used in the calculation of construction, the type of formulas for calculating constructive segments, the construction stages of the pattern. The constituent elements will be made of inextensible knit, except for the bra fastening element, which is to be made of stretchable material. The bra size is determined by the value of the bust perimeter IV and the conformation group. The conformation group is determined as the difference between the bust perimeter III and the bust perimeter IV:

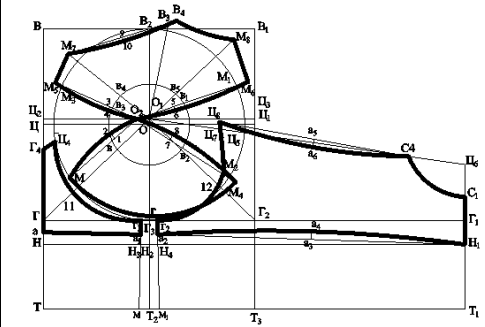
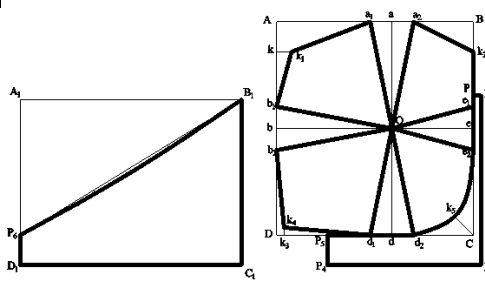
- Bust perimeter III – Bust perimeter IV = 12 cm – group 0;
- Bust perimeter III – Bust perimeter IV = 14 cm – group I;
- Bust perimeter III – Bust perimeter IV = 16 cm – group II;
- Bust perimeter III – Bust perimeter IV = 18 cm – group III.

The developed patterns correspond to typedimension 100-I. The construction stages

according to the selected design methods and the obtained basic patterns are presented in Table 1.

Table 1: Bra-type product patterns construction

Initial data		Construction stages	Basic pattern
anthropometric indicators number	including those of the breast gland		
English method Winifred Aldrich			
8	0	1. Choosing or drawing up the basic pattern for the product bodice; 2. Joining the front and back landmarks on the side line; 3. Construction of bra cup landmarks; 4. Construction of the back landmark.	
French method Line Jaqe			
7	0	1. Choosing or drawing up the basic pattern for the product bodice; 2. Joining the front and back landmarks on the side line; 3. Construction of bra cup landmarks; 4. Construction of the back landmark.	
Method of construction in radial networks			
7	4	1. Basic network layout; 2. Construction of bra cup landmarks; 3. Drawing the cup support element and the back landmark contour lines.	
Method Muller&Sohn			
12	0	1. Choosing or drawing up the basic pattern for the product bodice; 2. Joining the front and back landmarks on the side line; 3. Construction of bra cup landmarks; 4. Drawing the cup support element and the back landmark contour lines. 5. Construction of the back	

		landmark.	
Method ȚNIȘP			
9	2	1. Basic network layout; 2. Construction of bra cup landmarks; 3. Drawing the cup support element and the back landmark contour lines.	
Method of the Russian author L. Serova			
5	1	1. Construction of bra cup landmarks; 2. Drawing the cup support element and the back landmark contour lines; 3. Construction of the back landmark.	

The basic patterns constructions are analyzed by the details number and dimensions, the possibilities of adaptation to the requirements and characteristics needed for the post-operative functional-adaptive bra type product.

The results obtained from the comparative analysis of the developed basic patterns construction are presented in Table 2.

Table 2: Comparative analysis of the basic construction for the bra-type product

Construction method	Details number			Details dimensions, cm						
				cup			Cup support element		back	
	cup	Cup support element	back	On the centre front line	Centre cup line	On the sideline	Below the bust line IV	On the centre front line	On the sideline	On the centre back line
English method Winifred Aldrich	2	-	1	13	24	17	-	-	17	11
French method Line Jaque	2	-	1	10.5	21.4	7.6	-	-	7.6	7.6
Method of construction in radial networks	2	1	1	11.8	23.5	10.8	2.5	14.3	13.3	2.5
Method	3	2	1	13.6	21.5	16.2	1.0	13.6	16.2	3.5



Muller&Sohn										
Method ȚNIIȘP	2	1	1	9.6	25.1	7.5	1.6	10.2	13.5	5.9
Method of the Russian author L. Serova	4	1	1	18.6	28.4	17.9	4	22.6	22	4.5

5. CONCLUSIONS

The algorithm for calculating the method of construction in radial networks, the ȚNIIȘP method and the method of the Russian author L. Serova includes formulas using values of the dimensional parameters of the breast gland, which gives a better correspondence shape-dimensions-body-product. The number of details and their dimensions also correspond to a greater extent to the characteristics required for the concerned product construction. It is recommended to use the results of the study in the process of developing the constructions of post-operative functional-adaptive bra type products intended for women wearing external breast prostheses.

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