ELABORATION OF ASSORTMENTS OF GARMENTS FOR PERSONS WITH PHYSICAL DISABILITIES

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Abstract: *The elaboration and development of assortment of garments for persons with physical disabilities remains to be one of the actual concerns of specialists in textile. At the same time these problems are interconnected with the social protection policies and human society, as dressing is an important factor in the process of rehabilitation and social reintegration of persons with physical disabilities. This work addresses the problem of designing garments with high ergonomic characteristics and functional elements adapted to the specific requirements of the users with locomotion deficiencies. The theoretical investigations were aimed at the identification of the causes of locomotion disabilities and analysis of specific requirements to the garments, as well as at the determination of technological design correlated with the functional capacities and needs of the persons with locomotion deficiencies. The experimental results of the studies were implemented in a series of models of usual dresses with high ergonomics and functionality for the persons with physical disabilities of locomotion apparatus.*

Keywords: *elaboration of assortments, garments for persons with physical disabilities*

1 INTRODUCTION

The multitude of diseases immobilizing the people and making them dependent on the wheelchair determines their lifestyle to a significant extent. The wheelchair limits the amplitude and the number of accessible movements and reduces the functional possibilities of organism. These aspects determine the structure of the system of requirements imposed to the products and the specific approach to the composition, construction and technology of manufacturing.

The social reintegration and potential development of persons with locomotion system diseases is associated with a series of social and psychological problems. For a successful adaptation process the disabled persons first of all need psychological comfort that is to a considerable extent determined by the corresponding external appearance. In this context the use of inappropriate garments limits the self-service capacity and determines the psychological discomfort.

2 THEORETIC STUDIES

Following the conducted theoretic studies it is proposed to divide the garments for the persons affected by physical disability in usual items as a specific subclass, defined as ergonomic clothing that may be used for various purposes, with subsequent division by destination: special destination, product types, seasons, sex of wearer, dimension and type of product, etc.

The ergonomic products may be considered as elements integrated into the system „disabled person - clothing- environment" that must be adapted to the wearer's vital processes with special needs, so as to comply with the characteristic movements and positions.

So, we have defined the ergonomic clothing for the disabled persons, designed in accordance with their functional capacities and needs, with various technical accessories, aid systems and special parts.

Based on the results of problem analysis, the persons with locomotion system disabilities may be divided into three classes depending on the degree of affection of vertebral column:

- First class – includes the persons with partial or total immobility of upper extremities and head, determined by the affections of the cervical zone of vertebral column.

- The second class includes persons with partial immobility of body and normal functioning of upper extremities and upper part of the body, determined by the affections of sacral zone of vertebral column.
- The third class includes persons with partial or total immobility of lower extremities and normal functioning of upper members and body, enabling the person to use the wheelchair.

The theoretical researches were centered on the needs of the disabled persons of class three.

Taking the definition of ergonomic clothing as a subclass of usual wear, it has the same system of requirements to the users, being distinguished by the specific attainment methods.

One may identify the following groups of requirements imposed to the garments intended for the people with locomotion system disability:
1) Ergonomic requirements determining the commodity of wearing, freedom of movements and static correspondence;
2) Hygienic-physiological requirements imposing the conditions of comfort in the under-product strata;
3) Exploitation requirements imposing reliability and high resistance to wear;
4) Aesthetic requirements imposing a modern external appearance, attenuation of specific anthropo-morphological particularities and outlining of the strong aspects of the wearer's image;
5) Economic requirements – these impose pricing limits for procurement and low maintenance costs.

The tools providing for the observation of requirements imposed onto the products for the physically disabled persons include:
- Ergonomic requirements that may be assured by the justified volume of products, original constructive solutions, presence of cuts and tucks, closing systems and pockets, use of transformable elements.
- Physiological-hygienic requirements that may be assured by the use of main and auxiliary materials with adequate hygienic properties, by increase legerity margins, by the use of ventilation systems for the under-product strata.
- The exploitation requirements may be assured by adequate physical-mechanical characteristics of materials, by the use of applied constructive elements extending the life period of products and by the technological processing methods.
- The aesthetic requirements may be assured by the chosen chromatic gamma, by the use of modern elements, correct proportioning of products and location of compositional center on the unaffected parts of the body.
- The economic requirements may be assured by the use of relatively cheap materials with good body shape maintenance properties, resistant to frequent washing, chemical laundry and sweat action, as well as by a rational construction and progressive processing methods.

3 EXPERIMENTAL STUDIES

In order to determine the requirements imposed to the ergonomic clothing a study has been implemented in order to examine the preferences of persons with locomotion system disabilities. The study covered 17 persons aged 18 to 56. All respondents have mentioned that they are not indifferent to the trends of fashion, but convenience in wearing is the most important criterion in choosing garments, easy dressing and undressing being the top priorities.

The main wardrobe of the persons with locomotion system disability is composed of suits and separate products: jacket with trousers 88%, training suits 53%, jeans and shirts 41%, classic suits 12%, tricots76%, pullovers 59%, blouses 18%. No skirts and dresses have been reported to exist in the wardrobes of the interviewed persons. As for the materials, tricot is preferred by 67% of respondents as they consider it to be more comfortable and better positioned on the body.

Color is the primary characteristic of any combination of products chosen depending on the fashion trends, season of the year and group of wearers. The data collected during the study denotes that the most popular are the dark and moderate nuances – 33%, the light nuances being less popular – 21% and imprints even less popular – 13%.

Based on the results of analyses of the mentioned study it became possible to identify compositional-constructive solutions preferred by the wearers included into the target group. Generally, they prefer the straight, semi-adjusted or adjusted silhouette, shirt-type sleeve cuts, raglan or kimono of soft shapes, the closing system is preferred on the frontal reference element or in the lateral seam, in the form of textile band or buttons with buttonholes, zippers. The wearers prefer to have numerous ergonomically located pockets in

order to facilitate wearing without causing lesions. Flattened collars (32%) and hoods (18%) are preferred, as they do not cause incommodity to the wearers who have to make frequent movements with their superior extremities.

The new models of ergonomic garments for the persons affected by locomotion system disabilities must provide for the possibility of self-service owing to the adequate constructive solutions used for the closing systems and functional-constructive elements, as well as to provide for an aesthetic look in the static and dynamic positions specific for moving in the wheelchair.

The results of the study and the analysis of deficiencies identified in the products worn by the respondents allowed to identify the particularities of constructive and technological design of the main types of products worn by the wearers:

- There are high requirements to the correspondence of waist width at the shoulder level, as they determine the liberty of movements necessary for moving the wheelchair;
- The frontal side of the product with shoulder support is designed with smaller length compared to the back side, in order to prevent folds;
- The lateral seams of products with shoulder support are designed shorter in order to prevent touching the wheels, thus providing to the free and safe movement;
- For a better comfort ventilation elements are provided;
- The wearers prefer the products of pelerine type covering the body down to the level of chair in front and at the back, with a textile band down to the termination, in order to fix the product volume;
- The trousers are designed with a back side by 3-8 cm higher than the front side, so that in the sitting position the waist line is horizontal and the lumbar region is covered;
- Well-ironed and soft seams are preferred in order to prevent callosities and lesions from appearance. 100% polyester line is recommended for seam trimming, no. 120-160;
- The closing system for the waist-support products is generally longer than usual, so as to facilitate easy dressing in sitting or lying position, sometimes the closing system is provided in both lateral seams;
- The betel at the back level, of 1/2 or 1/3 of length shall be trimmed with an elastic band, so that the trousers come in direct contact with the back at that level;
- The length of trousers shall be increased compared to the standard one by 6 – 8 cm;
- On the front side of trousers, at the knee level, tucks or folds shall be provided so as to prevent prominences in sitting position.

In continuation one may consider the sketches of a series of models of ergonomic clothing elaborated for the preferred types of products. In order to comply with the wearers' requirements and to harmonize the anthropo-morphological particularities and the specifics of static position it was proposed to use the following constructive –functional elements:

1) For the products with support on shoulders – the product silhouette is semi-adjusted with convergent terminations; the product length above the shoulder line must be increased at back; the sleeves shall be of classical applied type, with a length of ¾, with convergent terminations, provided with freedom folds and elements for adjusting the width at terminations; the face and back of the product has an ergonomic freedom fold; the collars are of classical type for the closing system up to the neck base.
2) For the products with support on waist – trousers – the silhouette is straight; the shape at the support level is provided by a corselet; the closing system is extended and doubled, located in the lateral area; in the knee area on the front the tucks provide for the product shape; at the waist line level there is a possibility to adjust the product width by laces or by an elastic element.

The models of products shown on the figure 1 have been designed and manufactured in an individual system, the position and the dimensions of constructive-functional elements being cleared out experimentally.

In order to elaborate models of ergonomic products the authors have selected assorted fabric with high hygienic and exploitation properties: wool with lavs, cotton with artificial and/or synthetic fibers providing for a good external aesthetic appearance, integrity of product and stability of shape for its entire life period.
The ergonomic products for persons with physical locomotion system disabilities have been highly appreciated both for their anthropometric correspondence in statics and dynamics and for the aesthetic look of proposed solutions.

Figure 1: Series of new models of ergonomic products for the persons with physical disability

4 CONCLUSIONS

The proposed compositional-constructive and constructive–technological solutions allow to elaborate products providing for the possibility of independent or minimum aid dressing and undressing, as well as a harmonic external appearance facilitating a psycho-physiological condition favorable for the social activity of the wearer.

The elaboration of an assortment of ergonomic products for the persons with physical disability may be considered as an important factor in the process of social integration of persons of the considered group, as well as in raising their quality of life.

5 REFERENCES

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