

# PROIECTAREA ÎMBRĂCĂMINTEI ȘI DEZVOLTARE DE PRODUS

## ADAPTED CLOTHES FOR THE MOBILITY IMPAIRED

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**Abstract:** *Adapted clothes are defined as clothing, specially designed for people with physical disabilities, the elderly, the infirm and post-surgery patients who may have difficulty dressing themselves due to an inability to manipulate closures, such as buttons and zippers, or due to a lack of a full range of motion required for self-dressing eg. arthritis sufferers, quadriplegics and paraplegics. For estimation of main requirements to clothes for the disabled, who move with the help of wheelchairs, we used the method of questioning. The majority of respondents expressed their opinion that the most convenient everyday clothing for them is a sport suit. On the base of the results of questioning was developed a sport suit for wheel chair users, which has some peculiarities of design. In the sports jacket we provided the ability of unfastening of the bottom of sleeve with the use of zippers, the bottom and back of jacket were expanded, shelf suit narrowed, the lower part of the backrest was insulated; at the bottom of the sleeves were used wear resistant linings. Also were defined convenient locations of the pockets in jacket and sports trousers. The construction of trousers has no seating line, special folds was used in the knee area. It was defined the basic requirements for materials for manufacture of sport suit, hierarchical structure of material quality indicators for a sports suit was built.*

**Key words:** *Clothes for disabled, Wheel chair users, Special design, Sport suit*

### 1. INTRODUCTION

Physical disabilities can happen to anyone and can be acquired suddenly by accident, be with a person from birth, or come gradually through illness or disease. But the main causes of widespread of physical disability are considered wars and fighting in areas of armed conflicts. Disability is a complex phenomenon, reflecting an interaction between features of a person's body and features of the society in which he or she lives. The relation to disabled people indicates the level of maturity of modern humanitarian society. Throughout the years, several types of disability classifications have been elaborated. The most used being «The International Classification of Functioning, Disability and Health» [1], which establish the following disability types: behavioral, communicational, personal care, locomotors, physi-

cal, dexterity, and situational disabilities. A significant part of the disabled are those who use the wheelchair. Their life quality can be ameliorated by improving the design and functionality of clothes.

Adapted clothes are defined as clothing, specially designed for people with physical disabilities, the elderly, the infirm and post-surgery patients who may have difficulty dressing themselves due to an inability to manipulate closures, such as buttons and zippers, or due to a lack of a full range of motion required for self-dressing eg. arthritis sufferers, quadriplegics and paraplegics [2,3].

The purpose of the study is development of adapted clothes for the disabled, who use wheelchairs.

## **EXPERIMENTAL**

### **2.1. Test methods**

For estimation of main requirements to clothes for the disabled, who use wheelchairs, among potential users was held an expert review about their preferences in the type of clothes, peculiarities of it design, color and requirements to the properties of materials. For estimating hierarchical structure of material quality indicators and determination of the most significant of them conventional methodology was used.

## **2. RESULTS**

Analysis of the literature [1- 5] made it possible to determine the basic requirements for adaptive clothing. The majority of respondents expressed their opinion that the most convenient everyday clothing for them is a sport suit. However, its design should be significantly modified to take into account the peculiarities of use. The fact that disabled peoples, who use wheelchairs, are almost always stay in a sitting position, causes a number of problems associated with both aesthetic and also ergonomic properties. Sitting position of wheelchair users creates specific requirements for the cut of clothing: trousers tend to be too short at the back round the waist and too high over the stomach, so special kinds of trousers are required for comfort and style. Wheel chair pants require a high back rise, longer leg length and darts in the seat area. Elasticized waist is another feature of wheel chair trousers as they help the pants fit properly at the waist when the patient has to transfer. These pants may also have longer zip fly front and clip fastening. Another peculiarity of design was no pockets at the back, which minimises risk of skin and pressure issues and velcro or zips into the bottom of the trousers which are barely noticeable but allow better comfort while dressing and undressing.

On the base of the results of questioning was developed a sport suit for wheel chair users (Figure 1), which has some peculiarities of design. In the sports jacket we provided the ability of unfastening of the bottom of sleeve with the use of zippers, the bottom and back of jacket were expanded, shelf suit narrowed, the lower part of the backrest was insulated; at the bottom of the sleeves were used wear

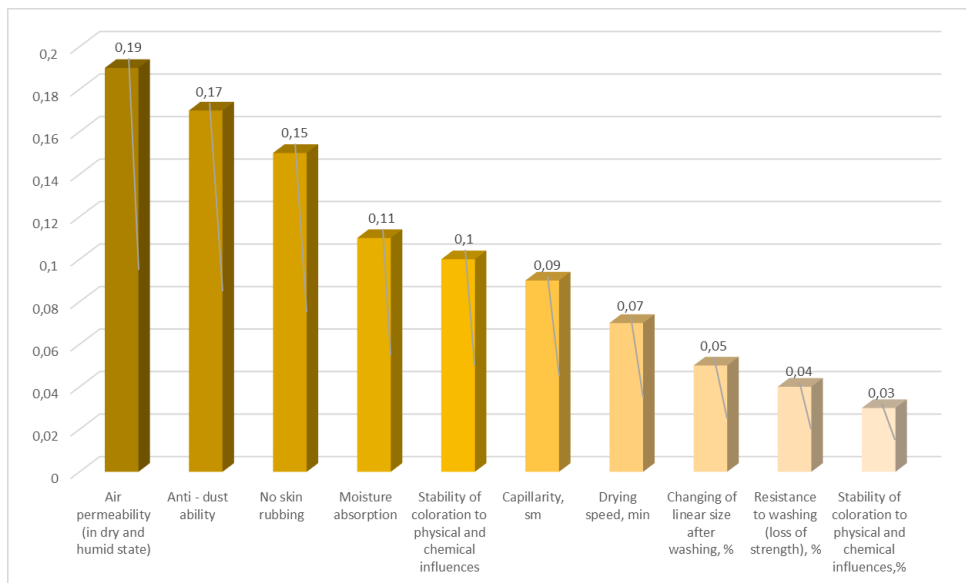
resistant linings. Also were defined convenient locations of the pockets in jacket and sports trousers. The construction of trousers has no seating line, special folds was used in the knee area.



**Figure 1:** Developed sport suit for the disabled, who use wheelchairs

Taking into account that the color of surrounding subjects, including the color of clothing, has a great influence on the psycho-emotional state of a person with a disability, an interview was carried out among potential consumers about preferred color gamut for the sport wear. It was established (Figure 2), that the most popular among respondents is dark blue color of clothes (45%), and then followed blue (17%) and turquoise (8%).





**Figure 3.** Hierarchical structure of material quality indicators for a sports suit

One of the main issues that require solving when choosing materials for sport suit are also the risk of occurrence of irritation on the skin in the areas of contact of clothes and skin, the ability of materials to create wrinkles and rough folds. Fabrics should be smooth, but not so slick as to foster sliding off a wheelchair seat. It is also must to consider the specific requirements of disabled people in relation to the wicking of body sweat, also known as the moisture management of the clothing: Because, due to their position, their back or the back of the thigh is in close contact with the hand bike or wheel chair, sweat can build up very quickly here. It is a question of trying various different suitable materials and functional designs (comfort mapping) in those areas to avoid this.

#### 4. DISCUSSION

Most people with physical disabilities want clothing that is attractive in appearance, comfortable, functional and easy to manage, safe, and easy to care for. When designing sport suit for wheelchairs users, we focus on satisfying their needs at a social, physical and psychological level. Therefore, a number of aspects were taken into account, such as: style, color and design, and the fabrics that will be used. Analysis of the literature and results of questioning made it possible to determine the following basic requirements for adaptive clothing.

- Adaptive clothing should benefit the wearer both physically and psychologically, make them feel good, promoting a sense of wellbeing.
- Medical enhancements to adaptive clothing should be discreet modifications; lightweight additions that do not bulk the garments, and allow unique enhancements like zippers to be easily tucked away and hidden.

- Adaptive clothing must look like normal clothes
- Materials used must not go to be abrasive to the skin.

According to these changes were made to the design of the sports suit, which will make it easier to dress-remove, reduce the rubbing of the skin at the points of contact with the seams of the product, increase wear resistance.

## 5. CONCLUSIONS

The carried out research has allowed revealing the basic problems connected with creation of adaptive clothing for people with disabilities.

On the basis of analysis of basic requirements for adaptive clothing was developed design of sport suit for people who use wheelchairs, estimated hierarchical structure of material quality indicators, determined the most significant of them and defined the basic requirements for materials for its manufacture. Elaborated sport suits were provided for trial operation.

## 6. REFERENCES

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