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STUDY OF THE ISSUE OF DESIGNING CLOTHES WITH THE FUNCTION OF PROTECTION AGAINST THE VIRUS

ИЗУЧЕНИЕ ВОПРОСА ПРОЕКТИРОВАНИЯ ОДЕЖДЫ С ФУНКЦИЕЙ ЗАЩИТЫ ОТ ВИРУСОВ

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ABSTRACT

SPECIAL CLOTHING, HARMFUL FACTORS, PROTECTIVE PROPERTIES, COMPLIANCE WITH THE QUALITY OF MATERIALS

The impact of the external environment adversely affects the state of a person, his/her life activity both at work and in everyday life. In order to develop clothing for protection against viruses, the issue of designing special-purpose clothing has been investigated, criteria for the effectiveness of the application of various solutions in the field of design, the use of constructive and technological solutions, the assembly of materials and additional finishing have been determined.

АННОТАЦИЯ

СПЕЦИАЛЬНАЯ ОДЕЖДА, ВРЕДНЫЕ ФАКТОРЫ, ЗАЩИТНЫЕ СВОЙСТВА, СООТВЕТСТВИЕ КАЧЕСТВА МАТЕРИАЛОВ

Воздействие внешней среды неблагоприятным образом сказывается на состоянии человека его жизнедеятельности как в производственных, так и в повседневных условиях. С целью разработки одежды для защиты от вирусов исследован вопрос проектирования одежды специального назначения, определены критерии эффективности применения разных решений в области вопросов дизайна, использования конструктивных и технологических решений, конфекционирования материалов и дополнительной отделки.

The main function of industrial clothing is to ensure the safety of working conditions, protection from the effects of harmful production factors, preservation of the normal functional state of a person, his/her working capacity during the entire working time [1].

The difficult ecological situation, which has developed both in people's working and everyday life, requires a revision of the issues of assessing the quality of special-purpose clothing [2]. In addition to the main functional purpose, clothing should be non-toxic, not irritating to the human body, and comfortable in terms of ergonomics [3].

Overalls must correspond to the work performed and the external conditions of the environment; the weight should not exceed 10 % of the person's weight; the cut should not impede blood circulation, not constrain breathing, not cause displacement of internal organs; ensure ease of cleaning from contamination; strength. Clothing that protects workers from exposure to hazardous and harmful factors, depending on the purpose and in accordance with GOST 12.4.103.83 "Special protective clothing, personal protective equipment for hands and feet. Classification", is divided into 15 groups and subgroups.

The classification is based on the protective properties of clothing, allocated depending on the impact on a person of harmful production factors.

When designing special-purpose clothing, it is important to take into account that the provision of protection functions must be provided at all stages of clothing design: when developing a design, a constructive and technological solution, and assembling a package of materials [4].

To confirm the choice of the list of properties, it is necessary to assess the possibility of using various materials in a clothing package, as well as to determine the criteria for the effectiveness of their use for the manufacture of a specific type of product. It is advisable to form a system of quality indicators that meet certain requirements [5].

Clothing for protection against viruses was selected as the object of research. A large number of industrial protection kits are currently being produced. However, with many of the advantages of these suits, they cannot be used as casual wear, however, the solutions used in these garments can be used to design household clothing.

Three aspects for research have been identified: characteristics of materials [6] recommended for use in household clothing with a function of protection against viruses; features of the constructive solution of these kits; features of the technological solution.

The properties of the fabric from which the clothes are made affect the likelihood

of contracting the virus. The higher the density of the material is, the fewer chances there are for the pathogen to leave it, being in the air. The material from which the clothes with the function of protection against viruses are made must retain moisture on the surface, be pleasant to the touch, resistant to mechanical influences such as tearing, puncture, cut, and drape well. Recent research suggests cotton as the best protection. For the special purpose clothing, materials with a defenseless feature are used, including:

- spunbond SMS, which is a combination of two outer layers of spunbond and inner meltbluane due to which a fabric is formed with high rejection rates of foreign elements and impurities and high protective properties;
- sontara or Softes, which are non-woven hydrophobic membranes consisting of cellulose and polyester, due to which they perfectly repel moisture drops, trap microorganisms and allow air to pass through;
- tyvek – the material is characterized by a large number of micropores, is made of polyethylene fiber, has the function of containing viruses and absorbing harmful fumes;
- saprel is a material that is a combination of polypropylene and polyethylene fibers, polypropylene fibers improve the tactile perception of the material, due to the polyethylene fibers, the function of barriers from harmful substances is enhanced.

The features of the constructive solution are:

- completeness of the suit, including overalls, dressing gown, shoe covers, cap, gloves, respirator, glasses, aprons, armbands, gas masks;
- the need to cover all open areas of the body;
- the presence of clamps, adjacent cuffs; stoppers for locks and other protective elements;
- correspondence to the size of a person, convenience in statics and dynamics.

From the point of view of technology, an important point is the presence of welded sealed seams.

The information obtained will be used in work aimed at creating clothing with the function of protection against viruses. Particular attention will be paid to the constructive solution. When designing products, structural details will be included to prevent viruses from entering the underwear, methods of fastening without buttons will be developed, folds will be excluded in smooth fabrics to prevent the accumulation of viruses.

The developed samples of clothing, the additional function of which is a means of protection, will not only protect a person from viruses but will also help to "purify" the environment.

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