

IMPROVEMENT OF THE SHAPE AND DESIGN OF TACTICAL FOOTWEAR FOR THE UKRAINIAN MILITARY

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Abstract: *The aim of this work is to develop new samples of military footwear that would meet the basic requirements for a modern tactical boot, be as comfortable as possible in terms of shape and parameters, and also have a competitive design and high manufacturing quality.*

For this aim, an improved form of the shoe last was developed based on the results of anthropometric studies of feet of Ukrainians and recommendations formulated for a tactical footwear. Also, the new variants of the design of military boots were developed, corresponding to new military trends, using Ukrainian national patriotic symbol Trident.

Key words: *military boots, shoe last, anthropometric studies, ergonomic shape, patriotic design.*

1. INTRODUCTION

In the current conditions of military aggression against Ukraine and the need to mobilize men into the ranks of the Armed Forces of Ukraine, it is especially important to provide military personnel with the high-quality equipment and ammunition. Military footwear must fulfill a number of requirements, including: strength, wear resistance, resistance to temperature extremes and high humidity, impact resistance, good cushioning, ensuring foot comfort in conditions of increased loads and extreme external influences, as well as comfort and providing the necessary support for the foot and lower leg. Military footwear can be of different types and models, the choice of which depends on the purpose and operating conditions [1]. However, today a kind of military fashion has formed in Ukraine, when, in addition to the approved factors influencing the choice of tactical footwear, design becomes one of the most important criteria. A separate object of study that most influences the comfort indicators of all categories of footwear is a shoe last. Ergonomic shape of the shoe last needs to be designed based on the shape of the foot of people belonging to the target category of consumers. One of the main areas of research aimed at improving the shape of shoes is anthropometric studies of the feet of the population of different categories. Studies of scanned footprints of more than a million people in Europe, Asia and America show a huge variety of foot shapes even within the same length [2]. Previous studies of the feet of certain categories of the mobilization reserve of Ukraine [3] demonstrate the need to improve both the existing forms of lasts used for the manufacture of tactical footwear, and the size and width range.

2. EXPERIMENTAL PART

Based on the results of anthropometric studies from the previous work [3], a new 3D shape of the last was developed, taking into account the shape of the molded sole chosen for this shoe. The shoe last of size 42 (for feet 270-275 mm) was made on the basis of the developed digital STL model at the Lviv-Plast factory. Further, after the

production of a test boots on it, the shape of the last was tested by several military personnel with the corresponding foot size. On the basis of the tested last, a new design of the military boots collection was developed and new designs of the upper parts of the shoes were designed using Ukrainian national symbols - the shape of a trident (Fig. 1).



Figure 1: Developed and sewn models of military boots of new design

When developing the design of the models, the requirements for tactical footwear and the wishes of the military personnel currently serving in the Ukrainian Armed Forces were taken into account: durable and reliable fastening on the foot, as well as the possibility of quick dressing - the presence of lacing, while the upper eyelets are replaced with hooks; protection of the feet from the aggressive effects of the external environment (the gusseted tongue with a soft padded lining); the use of a combination of leather with textile materials (cordura); the parts of counters, back straps, toe boxes or vamps are made of materials with increased strength (thick leather 1.6-1.8 mm); tuning details-amplifiers in the instep area was made of genuine leather; the presence of a zipper on some models for fastening speed; existence of a wide soft padded collar for the increased comfort while wearing.

3. CONCLUSIONS

As a result of the work, a new stylish collection of military boots of ergonomic shape and patriotic design was made. The developed models are based on the stylization of the shape of a trident with the transformation into the design of the details of the upper parts of the boots. The models are developed taking into account anthropometric requirements using environmentally friendly natural materials, which allows improving the equipment of the military AFU and increasing the efficiency of their combat missions.

4. REFERENCES

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