

## **ABSTRACT**

The master's dissertation consists of the introduction and 5 chapters, the conclusion and the list of used literature. The full volume is 73 pages, including 41 illustrations, 22 tables and 19 literary sources.

The urgency of this topic is that the number of people in need of rehabilitation has increased significantly in recent times in connection with the ATO in eastern Ukraine. Known foreign devices for passive restoration of the ankle joint, but their main disadvantage is the high price, and in our country the goods of this profile are not produced, so of this many people who need rehab can not afford expensive equipment. Known patents for active rehabilitation of the ankle joint, but their main disadvantage is that they are not suitable for the restoration of immobilized extremities. Therefore, it is proposed to create a rehabilitation device using a servo drive as a source of motion. The main advantage should be the price, due to the use of cheaper serial components.

The purpose of this research is to develop a rehabilitation device designed for forced reproduction of plantar foot flexion/dorsiflexion and abduction/adduction. Creating a control program is the second stage of the study.

Task:

1. Analytical review and patent search;
2. Development of the device design;
3. Development of a control program;
4. Layout and experimental research.

The object of research is the rehabilitation of the ankle joint.

Subject of research – methods and means for the rehabilitation of the ankle joint.

According to the results of the research, the possibility of creating a rehabilitation device with the hardware platform Arduino and the graphical programming environment National Instruments LabView has been proven, and a device layout has been developed. The use of these technologies will significantly reduce the cost of manufacturing devices and make them more accessible

The results of the research were published in the collections of the theses of the 10th International Scientific and Technical Conference of Young Scientists and Students "Новые направления развития приборостроения", the 10th International Scientific and Practical Conference of Students, Postgraduates and Young Scientists "Погляд у майбутнє приладобудування", 13 th The International Scientific and Practical Conference of Students, Postgraduates and Young Scientists, "Ефективність інженерних рішень у приладобудуванні", also received a certificate of registration of copyright in the work.

Keywords: ankle joint, rehabilitation, passive recovery method, Arduino, LabView.