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## DESIGN OF HOUSEHOLD LIGHTING DEVICES ДИЗАЙН БЫТОВЫХ ПРИБОРОВ ОСВЕЩЕНИЯ

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*Abstract. The article discusses the work on the design of a household lighting device. For this purpose, the history of the emergence of lighting devices, the evolution and forms of devices for lighting residential and non-residential premises have been studied. The typology and classification of household appliances lighting, their functions and purpose are determined. One of the main tasks has been solved, namely a design project of a lighting device in the UNOVIS style was created in compliance with the necessary functional, ergonomic, modern aesthetic requirements. The structure of the designed lamp, its functionality and characteristics have been thought out. A detailed analysis and selection of materials and processing technologies existing in industrial production was carried out, the choice of materials for the project implementation was validated. The design elements of the projected lighting device, the layout of the parts were developed, taking into account the production technology*

*Аннотация. В статье рассматривается работа по проектированию бытового прибора освещения. Для этого изучена история возникновения осветительных приборов, эволюция и формы приборов для освещения жилых и нежилых помещений. Установлена типология и классификация бытовых приборов освещения, их функции и назначение. Решена одна из главных задач – создан дизайн-проект осветительного прибора в стиле УНОВИС с соблюдением необходимых функциональных, эргономических, современных эстетических требований. Продумана структура проектируемого светильника, его функционал и характеристики. Проведен подробный анализ и подбор существующих в промышленном производстве материалов и технологий их*

*обработки, обоснован выбор материалов для реализации проекта. Разработаны конструкторские элементы проектируемого осветительного прибора, компоновка деталей, с учетом технологии производства.*

Industrial design covers a wide range of objects, from the most insignificant and simple to global and complex ones.

Currently, the view of lighting devices is changing, the very concept of the "lamp" is expanding and changing. It is no longer enough to produce just a household appliance. It is necessary to create an accessory for the room that could reflect the inner world of the owner of the space.

2020 was the year of the 100th anniversary of the creative association "UNOVIS", which was created by Kazimir Malevich at the Vitebsk National Art School. This trend became one of the starting points of the innovative art trends of the twentieth century. The performance of a lighting device based on suprematism is relevant as a souvenir, unexpected and possible to implement. As a result, the aim of the work is to create a design project of a household lighting device in the style of UNOVIS in compliance with the necessary functional, ergonomic, modern aesthetic requirements. To achieve this goal, it is necessary to solve the following practical tasks:

- to study analogues in Belarus and abroad;
- to define design requirements;
- to develop a general concept of the project, taking into account the features;
- to think over the structure, study and select materials;
- to develop a 3D model.

The practical significance of this work lies in the fact that the creation of a lighting device in the style of UNOVIS will be a landmark solution of a focused attitude to the historical and cultural heritage of our country, because the avant-garde ideas of UNOVIS, which have already become classics, and even after 100 years look more modern than the new ones.

As a result of the research work, the history of the emergence of lighting devices, their evolution and forms have been studied. The typology and classification of household appliances lighting, their functions and purpose are determined. Lighting devices in Europe, the USA and the CIS countries, ways of their connection to sockets are analyzed.

Most of the research is devoted to the study of the possibility of using the works of supremacists of the creative association UNOVIS for the design of a lighting device. It was decided to use the works of D.A. Yakerson to develop a single iconic image that would set the direction in creating the design of the suprematist figure (Figure 1).

The stylization of the work revealed clearer lines and the constructiveness of the main shape of the lamp. The contour image of the generalized figure corresponds well to the UNOVIS style, the idea of which is a departure from the usual shapes and smoothness.

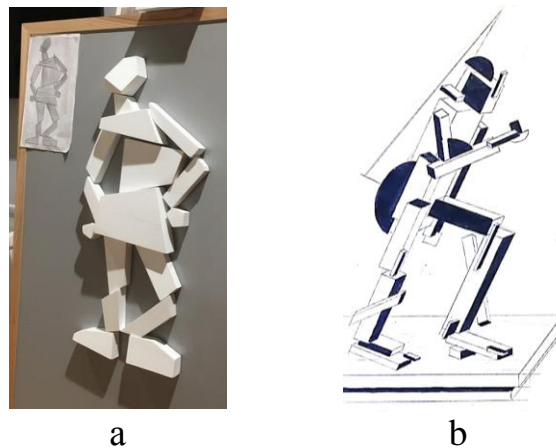


Figure 1 – Example of a three-dimensional structure based on the work of D. Yaskerson (a, b)

In the design part, work was carried out on the design of a household lamp. The so-called "gestalt" was taken as the fundamental figure – a wooden human doll (mannequin) depicting a human figure with movable arms, legs, and head. The object is mounted on a metal pole with a wooden stand for stability. At the end of the process, the shoulder-tripod was modified so that the figure could squat and turn at will. Spotlights on a tripod can be mounted on a tripod or directly on the floor.

The spotlight on a tripod is more versatile, which makes it possible to use the lighting device both indoors and outdoors (Figure 2). In this case, the moisture-proof characteristics of a particular model are taken into account.

To visualize this project, the following computer software was used: Autodesk 3ds Max 2014; and a V-Ray plugin to obtain a photorealistic image. A three-dimensional model of the lamp was created in the Inventor Autodesk program, and finally rendered in Luxion KeyShot Pro.

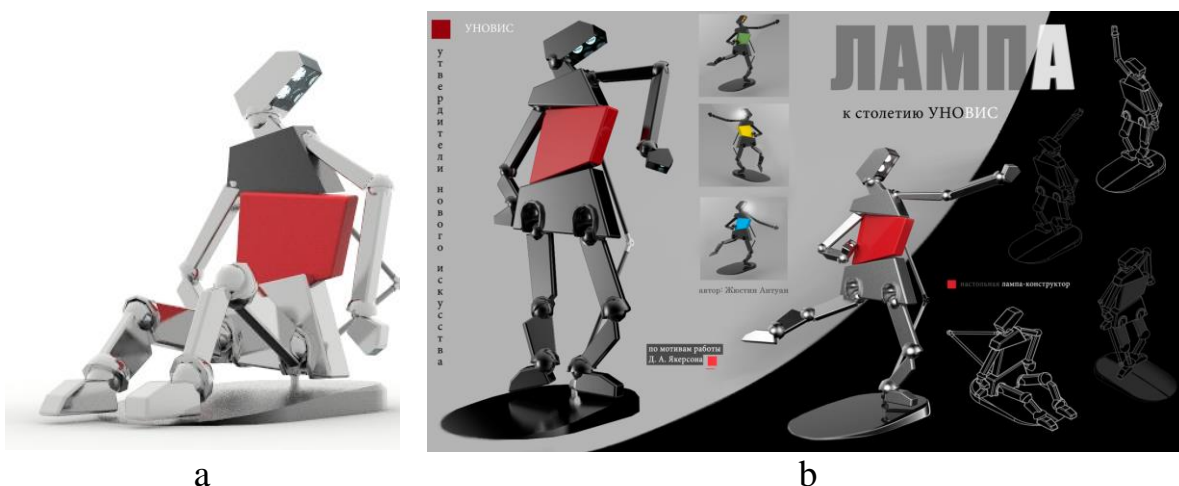


Figure 2 – Images of a designed lamp (a, b)

It is established that the directly proposed version of a household lamp carries the following ergonomic tasks:

- distributed weight of the product, which allows the lamp to be stable;

- convenient shape of the lamp stand for hand grip, which makes it possible to carry the lamp while holding it in one hand;
- lighting of the working area directly;
- the use of matte light of the lampshade glasses, so that the light of the bulbs does not hit the eyes;
- performing the function of the main decorative element in the zone within the zone space, it does not compete with other lighting devices.

The analysis of materials and technologies existing in industrial production for the implementation of the project is carried out. It was decided to carry out the case by 3D printing from materials available on the territory of Belarus.

The designed household lamp has good technical and economic indicators and is a competitive product on the market, as it is new and extravagant. the lighting device can be used directly as a household lighting device, both in residential and public premises, as well as as a decorative item or a stand for accessories.

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