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ABSTRACTS**

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FUNCTIONAL ECO-FRIENDLY PACKAGING FOR PENCILS

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Abstract:

Pencil manufacturers primarily focus on their price and sufficient service life. Pencils of different softness, pastels, and watercolors are quite expensive and require reliable protection. Packaging for pencils is often made more attractive using printing design. However, its functionality is frequently overlooked. Patent documentation on this issue is primarily focused on achieving ease of use, characterized not only by the use of packaging as a place to store pencils but also by the presence of devices for sharpening and fixing them. The packaging design focuses on the convenience of holding and removing pencils. The package consists of a base, a top lid, a place for attaching the pencils, and a mechanism for lifting the pencils to a vertical position. When the lid is opened, the pencils automatically rise to a vertical position, from which it is convenient to take pencils by hand, both long and reduced in size due to prolonged use. The packaging has a place for an eraser, sharpener, and other accessories. The production of pencil packaging by means of FDM 3D printing technology is a reasonable and promising solution that meets modern requirements for eco-friendliness, functionality, and adaptability of production processes. The material used for production is PLA plastic, a thermoplastic and biodegradable polymer made from renewable resources, like corn starch or sugar cane. Using PLA for 3D printing reduces energy costs and minimizes environmental impact.

Key words: *design, eco-friendly, FDM 3D printing, packaging, pencils, PLA plastic*