

Quick-Replace Vacuum Forming Film Fixation Device

I. Title of Research: Quick-Replace Vacuum Forming Film Fixation Device

II. Research Team Members

Department	Name	Position
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III. Development Idea

Modern consumer scenarios have entered an era of small-scale customization, moving away from designing products with a mass production mindset. In the past, blister packaging production typically required a batch size of at least 3,000 units. For local market promotion, this approach often resulted in excessive inventory, which not only burdened startups developing small-scale products (under 500 units) but also led to cash flow issues and hindered market circulation. Moreover, this surplus inventory contributed to resource waste and environmental burdens from production to recycling.

In this context, a small-scale customization model offers a viable solution for product commercialization, supporting startups and businesses in meeting the demand for low-volume production.

On the materials front, the market demands a broader selection of plastics, more size options, and a wider variety of colors. To address this, the equipment developed in this project is designed to be open-source, adaptable to multiple materials, and equipped with suction control functionality to accommodate various plastic sheet sizes. This approach provides greater flexibility compared to relying on a single type of plastic sheet.

IV. Technological Competition and Industrial Application

This technology introduces a magnetic vacuum forming film fixation mechanism, aimed at improving the key module of current vacuum forming machines on the market. The objective is to address issues caused by excessive force during operation and the inconvenience of replacing film sheets for different users. By making the film replacement process more user-friendly, this innovation enhances the usability of the equipment.

In this project, analysis and research are conducted to optimize the mechanism, culminating in the development of a prototype. The subsequent goal is to enable small-scale production for household and studio equipment, providing innovative studios with a practical tool to expand their market potential.

V. Merchandise Statement of Achievement

The development of small-scale customized rapid blister forming technology aims to provide blister packaging solutions tailored for product commercialization. This can be implemented through Original Equipment Manufacturing (OEM) or by assisting with the design and production of rapid molds for blister packaging under the Original Design Manufacturing (ODM) model. Additionally, the technology enables commercialization of these services.

This solution incorporates 3D printing to produce temporary jigs, facilitating small-scale production of blister packaging to meet the demand for customized, rapid blister forming.

For non-rigid material products requiring blister packaging, traditional methods necessitated the use of temporary jigs, which often posed a financial burden for many small and medium enterprises (SMEs) or startups. Leveraging advancements in 3D printing technology, this solution uses 3D reverse engineering to create digital models and produce temporary jigs via 3D printing. This approach significantly accelerates production for small-scale, diversified manufacturing needs.



Fig. 1: This vacuum forming machine is used to produce blister packaging from epoxy resin models.

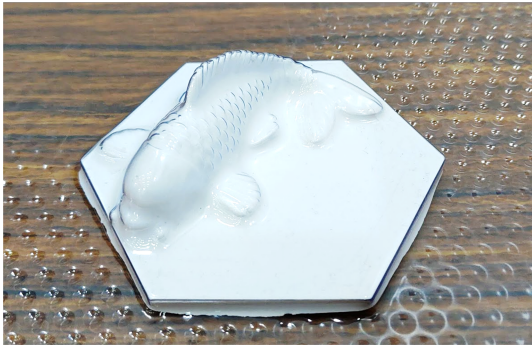


Fig. 2: After the blister is formed, the blister is used as a mold for casting with plaster material.