The Research Design of the Pressure-Tight Palette for Oil Paintings

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Abstract. The product developed by this study is an innovatively designed pressure-tight palette for oil paintings. Near the opening of the box of the product, there is a ring-shaped and raised wedging edge, with a ring-shaped supporting edge under it and a lid. By the two opposite edges at the bottom of the lid are the two breaches extended to the proper spots at the bottom on the contiguous sides, forming the supporting points. When the lid of the box is closed, pressure can be imposed on the lid, and air will be exhausted through the raised wedging edge and the two breaches, to create the pressure-tight effect. To open the lid, force can be imposed on it. The depending point is the fulcrum while the breach is pressed toward the supporting edge and air can get in through the opening between the raised wedging edge and the lid when the other breach comes off the supporting edge. Then the lid can be easily opened. This way, colors can be well kept in the palette for future use.

Keywords: pressure-tight, oil painting, palette.

1 Design Concept

Currently in the market, the pressure-tight technology is mostly used in window design. Pressure-tight windows can block noises from outside or specially designed to sustain indoor temperature while it is too cold outside. Also sometimes this technology is applied on car windows to solve rain drops problems. With light and soft designs, this technology helps to extend ranges of product effects. For example, mist problem can be solved easily and conveniently. Furthermore, after the pressure-tight technology is applied in designing, costs can be saved, problems can be solved rapidly and efficiently, and expected ideals can be reached [2] [5] [6].

Discussions in studies of oil painting related issues are mostly regarding exploration of painting styles, usage of painting skills, and recreation of masterpieces. Of course, there have been oil painting simulations, teaching, and designing using Autodesk Drawing Software or other 3D computer software [1] [3] [4]. However, there have been very few studies or inventions related to research and development of tools for oil paintings. Thus, the innovatively designed product of this study is a pressure-tight palette for oil paintings, featuring well preservation of colors and convenience to open. Oil painters can simply close their palettes while painting or
resting, instead of spending a lot of efforts going through minute and complicated process to clean up like they did before. This way, efforts can be saved, novices may be more interested in oil painting, and more artists may devote themselves into the field of oil painting.

2 Theoretical Foundations

The traditional palettes for oil paintings which people generally use are made of two block-shaped plates. The two plates are combined by a pivot component, so that they can be either folded together or spread up becoming one single plate. By fixing the two plates with a fixing component, it would be difficult to fold the two plates using external forces. One can hole the palette by putting his thumb through the hole on the plate.

To put away a traditional palette which comprises two plates, it has to be folded. And colors for oil painting are rather expensive. If they are not shoveled into color bottles, they may dry out and wasted for they cannot be used anymore. To avoid this kind of wasting, painters usually have to shovel colors back into color bottles one by one and kept them there. However, different colors may be mixed during the process, and when they are needed next time, painters have to put those them back on palettes again. This complex process often causes a lot of inconvenience.

Because of these known problems of traditional palettes, it is all consumers’ wish that a more practical palette can be invented. And this has also become the development goal and direction for related manufacturers. Therefore, based on the researcher’s years of experiences in researching and developing related products, considering the above-mentioned goal, the inventor went through detailed design and evaluation and finally developed this practical and innovative product.

3 Content

Traditional palettes are for color mixing only. When users are done with their paintings, if colors are not put back to color bottles, they may dry out. For the purpose of preserving colors so that they can be used again, users must spend time and efforts shovel colors into color bottles and take them out again next time when they are needed again. This complex process always causes user a lot of inconvenience. This is the technical problem of traditional palettes which needs to be solved.

The innovatively designed product of this study is a pressure-tight palette for oil paintings. Near the opening of the box of the product, there is a ring-shaped and raised wedging edge, with a ring-shaped supporting edge under it and a lid. By the two opposite edges at the bottom of the lid are the two breaches extended to the proper spots at the bottom on the contiguous sides, forming the supporting points. When the lid of the box is closed, pressure can be imposed on the lid, and air will be exhausted through the raised wedging edge and the two breaches, to create the pressure-tight effect. To open the lid, force can be imposed on the lid. The depending point is the fulcrum while the breach is pressed toward the supporting edge and air
can get in through the opening between the raised wedging edge and the lid when the other breach comes off the supporting edge. Then the lid can be easily opened. These are the features of the technology developed by this study to solve the problem.

The innovatively designed product of this study helps to preserve colors properly for reuse through the pressure-tight effect created by the structure with a box and a lid. With this structure, users can open their pressure-tight palette for oil paintings in a short time. The technology, methods, and effects of this innovatively designed product are described later with illustrations to help readers understand the goal, structure, and features with deeper insight.

4 Mechanical Application

The innovatively designed product is a pressure-tight. It comprises a lid and a box. By the two opposite edges at the bottom of the lid are the first and second breaches extended to the proper spots at the bottom on the contiguous sides, forming the supporting points. And above the first breach on the top of the lid there is a pressing point. On the box near the opening there is a ring-shaped and raised wedging edge, with a ring-shaped supporting edge under it. Between the raised wedging edge and the supporting edge, there is a trench. The contact surface on the box with the first breach is called the first closing area, while the contact surface on the box with the second breach is called the second closing area. The second closing area is a little bit higher than the first closing area. From the side view, there is a slope called the first slope. Near the first closing area, there is the second slope, which is at different height from the first slope. And on the top of the second closing area, there is a concave edge. With this edge, when the lid is closed, force can be imposed on the pressing point. Then the supporting point becomes a fulcrum for the lid while the lid gets closer to the first and second slopes. The first breach gets closer to the supporting edge. Air goes through the second breach, leaving the supporting edge, and enters through the gap between the raised wedging edge and the lid. Also, the concave structure by the top edge of the second closing area allows air to enter the box rapidly, so that the lid can be opened easily.

The lid and the box are made of metal plates or plastic ones with elasticity. When the lid is closed, the air inside can be emitted through the gaps between the raised wedging edge and the first and second breaches to create the pressure-tight effect by imposing force on the lid. On one side of the box, a ring-shaped component with a hole can be installed. When the lid of the box is opened, a fixing component can be used to fix the lid and the box so that they form one plane. When using the palette, user’s thumb should go through the hole of the ring-shaped component so that his arm can support the whole pressure-tight palette for oil paintings to save some efforts (figure 2). This is the specific detailed description of the implementation of the technology applied to this innovatively designed product.
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Figure 1 Mechanical Component Diagram
5 Contribution

The contribution of the mechanical design of this innovatively designed product is as below:

This study proposes an innovatively designed palette product which improves color preservation with more convenience. In the aspect of the structure, by the two opposite edges at the bottom of the lid are the two breaches extended to the proper spots at the bottom on the contiguous sides, forming the supporting points. On the box near the opening there is a ring-shaped and raised wedging edge, with a ring-shaped supporting edge under it. Between the raised wedging edge and the supporting edge, there is a trench. The contact surface on the box with the first breach is called the first closing area, while the contact surface on the box with the second breach is called the second closing area. The second closing area is a little bit higher than the first closing area. On the top of the second closing area, there is a concave edge. The second slope is at different height from the first slope. And above the first breach on the top of the lid there is a pressing point. The lid and the box are made of metal plates or plastic ones with elasticity. The lid and the box are made of metal plates or plastic ones with elasticity. After the lid is opened, the box and the lid are fixed with a fixing component. On one side of the box, a ring-shaped component with a hole can be installed, so that painters can easily hold their palettes with their thumbs through the holes. Of course, this design not only helps users to open and put away their palettes, but also solves the trouble of colors being mixed in the process of shoveling colors back to color bottles, while users can conveniently reuse those colors to reduce wasting.

The pressure tight theorem is applied to the innovatively designed palette for oil paintings in this study. With the designed structure, this innovative product helps to overcome many difficulties which may be encountered in the process of creation with traditional palettes for oil paintings. Generally speaking, the advantages of this innovative product include:
(1) Conceptual Innovation
The research and development of the innovative product in this study is from the perspective of painters. The design is improved according to the difficulties which may be encountered while using traditional palettes. Solutions with innovative concept are proposed to solve these problems. The result of this study is beyond traditional concept and thoughts. It is worthy to promote it.

(2) Convenience for putting away
The pressure-tight theorem is applied to the design of the palette with a simple structure, so that oil painters can save the time spent on cleaning their palettes and get some rest instead. All they have to do is to close their palettes. Putting their palettes away can be done easily with fewer complex steps.

(3) Being Energy Saving and Eco-Friendly
Colors for oil paintings are usually more expensive than general watercolors or poster colors. When not being used, colors may dry out and can therefore not be able to be used anymore, causing waste. With the press-tight design of this study, colors for oil paintings can be preserved for a longer period of time. When painters need to rest, they don’t have to shovel their colors back to color bottles or throw them away. All they need to do is to fold their palettes. The problem of colors being mixed can be avoided and waste can be reduced.

(4) Market Expansion
There are issues of inconvenience and waste while using traditional palettes for oil paintings. The innovatively designed product of this study, a pressure-tight palette for oil paintings, benefits a lot of users who love oil painting creation. The perspective of market expansion is very good.

References