Creative Invention Research of Directional Ceiling Light Reflector

Rui-Lin Lin
Department of Commercial Design
Chienkuo Technology University
Changhua, Taiwan
linrl2002@gmail.com

***Abstract*—The innovative product design uses a light reflector with adjustable direction so that light can be projected on a focused point. With this design, light can be cast wherever it is needed, making it more focused, consequently achieving the function of carbon reduction.**

Keywords—creative design, innovative product design, light reflector, carbon reduction.

I. INTRODUCTION

Fluorescent lamps are usually installed in factories, offices, classrooms, and other places. They are an indispensable illuminating device for everyday life. However, existing fluorescent installations are affixed at specific locations and can only distribute light beams to a predetermined area. The area where the light shines cannot be changed so as to enable the fluorescent light to shine outside the frame. Moreover, it does not have the ability to focus on a desired area for lighting, resulting in waste of energy and non-compliance with environmental design for energy conservation.

With regards to existing problematic spots, the development of a more practical and innovative structure is in fact eagerly awaited by the public. This is also the goal that must be met by the research and development of relevant industries. The creative invention mentioned in this article provides an adjustable directional ceiling light reflector. This improved technology is created by letting the reflecting plate and its cover form an angle. When the cover is placed on the base frame, lamp illumination can be adjusted to achieve the effect of energy conservation.

II. LITERATURE REVIEW

Experiments were conducted on the developed technology by applying new methods and materials, in hopes of producing a more energy efficient and durable lamp [2]. Scholars are still discussing and experimenting on the components and structure of white organic light-emitting diodes (WOLED). Although energy issues are important, health considerations of users should not be ignored [5].

Furthermore, when choosing a lamp, softness, temperature, effects on the eyes, etc. of the light beam should also be noted by users [4] [1]. Another scholar conducted a conversion experiment on lighting power by solar battery in an attempt to put forward a different structural design and to achieve more effective lighting [3].

III. CREATION DESIGN

The ceiling light reflector with adjustable angle in this article can be placed on the base frame with a pivot shaft. The structure has an outer frame and a number of reflecting plates that form light-permeable zones. These are placed in parallel within the reflecting plate and then placed in parallel at the outer frame. The outer frame has a flat opening, so that each of the reflecting plates can have a plate that forms an angle with the flat opening of the frame in order for numerous reflective plates to reflect light, whereby changing area of light beam.

The greatest feature of the creative invention mentioned in this paper is that it illuminates wherever needed. The concept of energy conservation was behind the implementation of this improved structure. This more economical and energy efficient design attempts to change traditional habits which is in line with new environmental protection concepts. In addition, focusing light beam is beneficial for user eye care and makes work more efficient.

IV. DESIGN RESULTS

The product in this article was mainly created because illumination areas of existing lamps are usually limited due to circuit arrangement. If there was no proper planning originally, subsequent users cannot adjust the lamp according to their actual need, resulting in insufficient or wasted light. Therefore, the cover structure of the lamp was revolutionized and improved so as to provide users with an illumination area that is adjustable through remote control to help save energy. The following is the structure combination chart (figure 1), adjustable simulated light beam angle (figure 2), simulated lamp (figure 3), and poster design (figure 4). In addition, this creative idea has passed the creative works selection of Chienkuo Technology University and received subsidized funding to participate in the 2016 Macao International Innovation and Invention Expo and Competition and won a silver medal (figure 5).

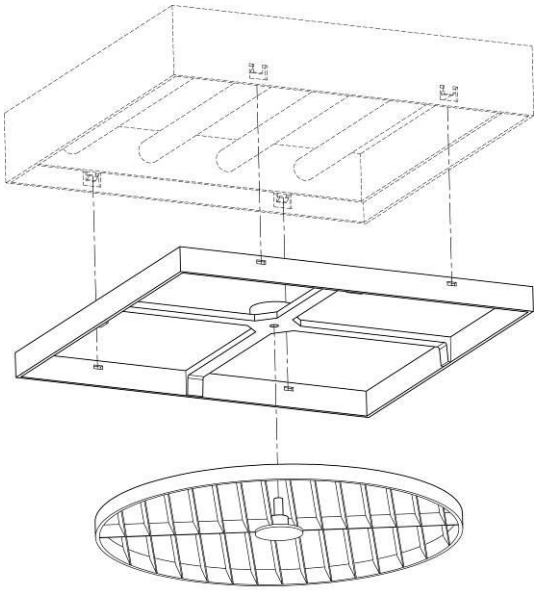


Fig. 1. *The structure combination chart*

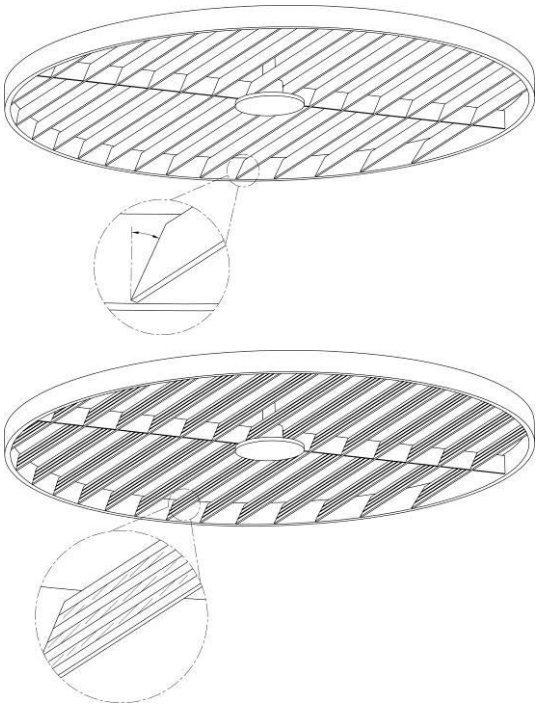
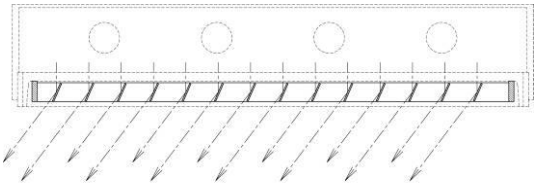


Fig. 2. *Adjustable simulated light beam angle*



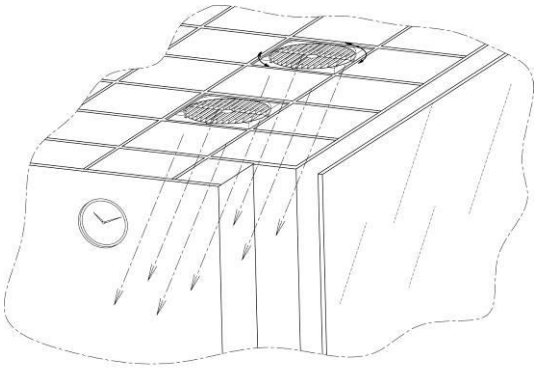


Fig. 3. *simulated lamp*

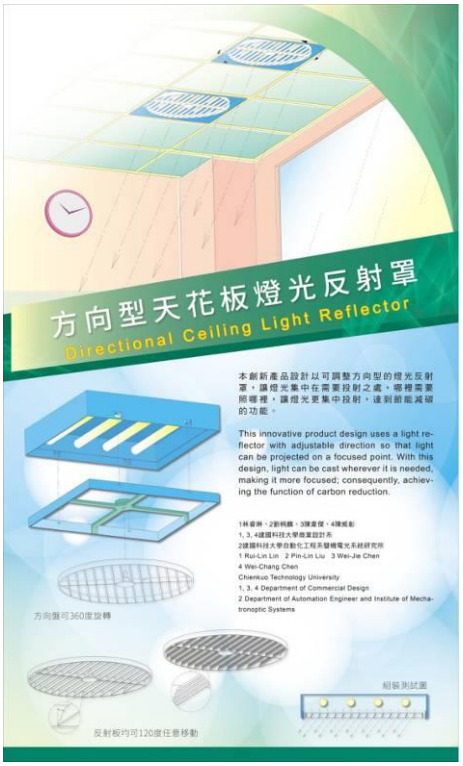


Fig. 4. *Poster design*

Fig. 5. *Silver medal*

V. CONCLUSIONS

In general, the results for the innovative research and development of this study are summarized and illustrated below:

(1) Problem identification: An improved structure for existing user problems was proposed which solved situations of insufficient or wasted light.

(2) Structure innovation: The method of illumination angle adjustment was made available, which is both simple and innovative.

(3) Carbon emission reduction: To illuminate wherever needed is no longer a dream. This product accurately provides a more energy-efficient lighting system in daily life.

(4) Commercial production: The design of this innovative structure can be provided as reference for mass production by related industries.

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