United States Patent

Pennington et al.

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[45] **Oct. 31, 1972**

[54] LIGHT FIXTURE WITH CHANGING LIGHT EMISSION

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[73] Assignee: **Kinetic Lighting**

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[52] **U.S. Cl.**.....**240/78 CF,** 40/33, 40/77, 40/133 A, 240/108

[51] **Int. Cl.** **F21s 1/06,** F21s 3/06

[58] **Field of Search**.....240/10.1, 78 CF, 108; 40/33, 40/77, 133 A, 133 B, 106.53

[56] **References Cited**

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[57] **ABSTRACT**

A light fixture having a light source surrounded by an opaque cylinder member having a large number of small holes therein for permitting light to pass therethrough into a set of prisms disposed in a cylinder just outside said cylinder member, and a motor to rotate said cylinder member about its axis, said prisms being elongated substantially parallel to said axis, said cylinder member being flexible to permit it to be mounted on three spokes radiating from the output rotary shaft of said motor by said spokes being received through three of said holes in said cylinder member.

7 Claims, 8 Drawing Figures

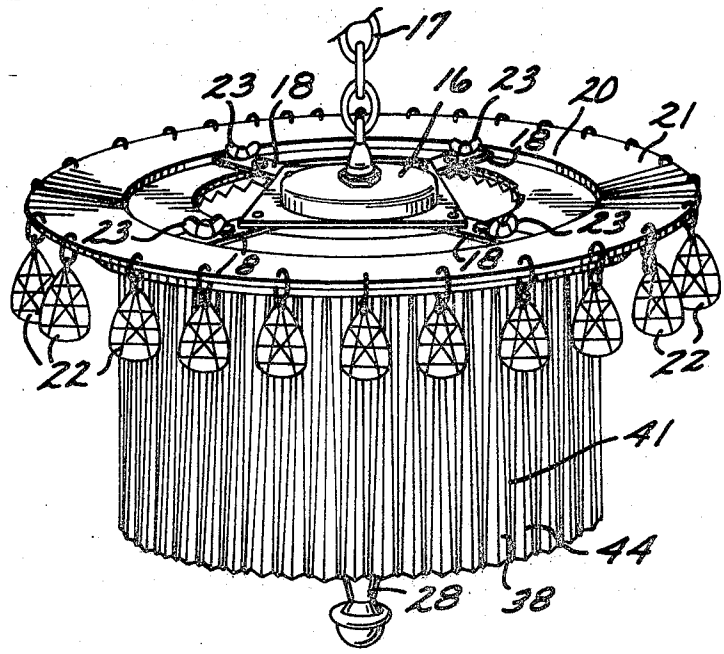


FIG. 1

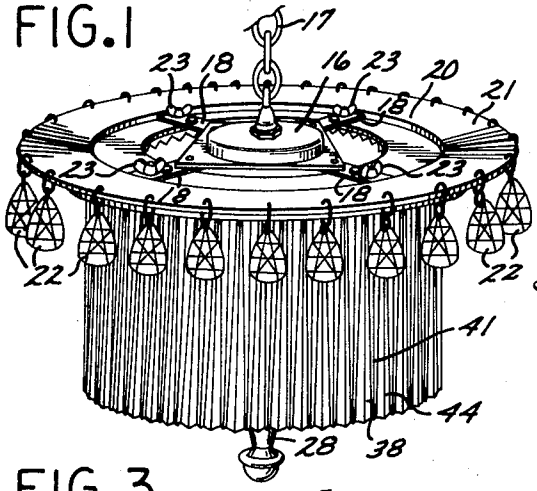


FIG. 2

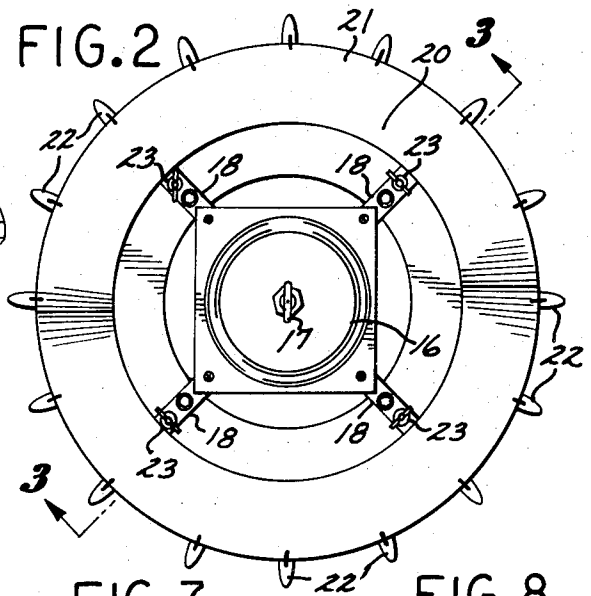


FIG. 3

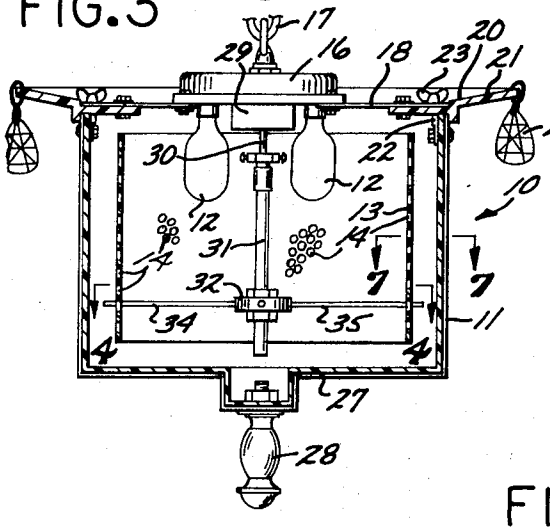


FIG. 7

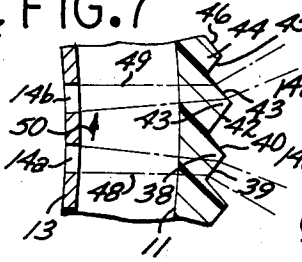


FIG. 8

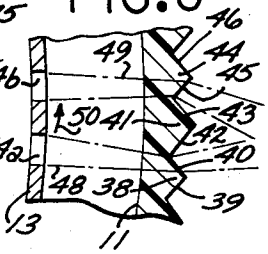


FIG. 4

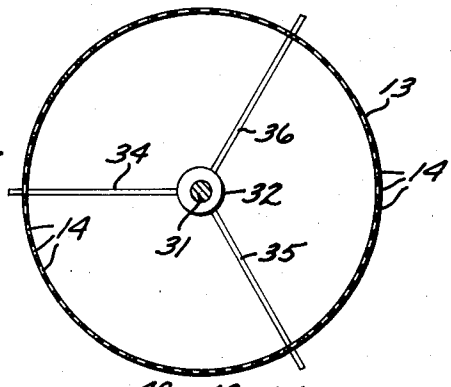


FIG. 5

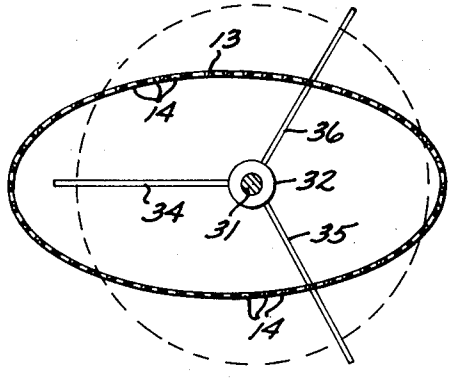
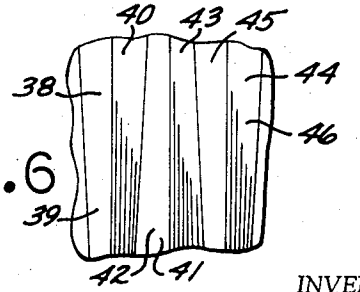


FIG. 6



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LIGHT FIXTURE WITH CHANGING LIGHT EMISSION

This invention relates to light fixtures, and more particularly to light fixtures which have a transparent enclosure with means within the enclosure for constantly changing the effect on the enclosure of a light source within the enclosure.

Briefly, light fixtures incorporating the present invention include a transparent enclosure with a light source disposed therein. And, between the light source and the transparent enclosure, there is provided means which interupt the light emanating from the light source more in certain small areas than in other areas. And, by constantly moving said light interuption means, there is an optical effect of lights moving on the enclosure, which effect is augmented by forming the enclosure as a series of prisms.

An important aspect of the light fixtures incorporating the present invention is that they can accomplish the constant changing of the light emission and yet the fixture is susceptible to low cost manufacture and reliability of performance.

With the foregoing in mind, it is a major object of this invention to provide an improved light fixture which has constantly changing light emission.

Another object of this invention is to provide a light fixture with varying light emission, which fixture can be constructed at a low cost.

Still a further object of this invention is to provide a light fixture with moving internal structure which fixture can be easily disassembled for insertion of new light bulbs.

It is still another object of this invention to provide a simple light fixture which has the capability of constantly varying the appearance of the light fixture.

Still another object of this invention is to provide a light fixture which can accomplish greater variation in the appearance of the fixture with minimum movement of components within the fixture.

It is still a further object of this invention to provide a light fixture with constantly changing light emission, which fixture can be rapidly assembled or disassembled.

Other and further objects of this invention will become apparent in the detailed description below in conjunction with the attached drawings wherein:

FIG. 1 is a perspective view of a preferred embodiment of the present invention;

FIG. 2 is a somewhat enlarged plan view of the light fixture disclosed in FIG. 1;

FIG. 3 is a cross sectional view of the light fixture, taken along line 3—3 in FIG. 2;

FIG. 4 is a fragmentary cross sectional view of the light fixture, taken along 4—4 in FIG. 3;

FIG. 5 is an enlarged cross sectional view of the fixture disclosing how the light interuption means is flexed for assembly and disassembly purposes;

FIG. 6 is an enlarged fragmentary view of the fixture enclosure disclosing details of the prisms of the enclosure;

FIG. 7 is an enlarged fragmentary cross sectional view of the fixture, taken along line 7—7 in FIG. 3, with the light interuption means in one position; and,

FIG. 8 is an enlarged fragmentary cross sectional view of the fixture, taken along line 7—7 in FIG. 3 but with the light interuption means in a somewhat different position.

Referring now to the drawings, there is disclosed a light fixture, indicated generally by the arrow **10**, which is a preferred embodiment of the present invention. Briefly, the fixture **10** preferably includes a transparent, or nearly transparent, prism enclosure **11** having a plurality of lights **12** therein. For interupting the light rays between the lights **12** and the enclosure **11**, there is preferably provided a perforated opaque cylinder **13** having a large number of small holes **14** therein. By means to be described further below, this cylinder **13** is constantly rotated at a slow speed, e.g., 1 to 3 RPM, to accomplish the constantly changing light emissions as desired.

The fixture **10** includes a centrally disposed plate **16** which has means for securing thereto a chain **17** for the purposes of hanging the fixture from the ceiling. A plurality of struts **18** are secured to the plate **16** and radiate to a position where they are secured to ring **20**, having a flange **21** preferably which projects beyond the enclosure **11**. Through the use of a plurality of bolts **23**, the enclosure **11** can be removably secured to the ring **20** by means of wing nuts **24**.

The plate **16** and the ring **20** effectively substantially close off the open top of the enclosure **11**. The enclosure **11** also has a bottom **27** with a centrally disposed depending ornament **28**. The structure of the enclosure **11** will be described in further detail below. Suffice it at this point to state that the enclosure **11** is preferably molded out of some transparent, or nearly transparent plastic.

At the center of the enclosure **11**, there is secured to the plate **16** a motor-gear box **29** having a motor therein which receives power from the same source that illuminates the lights **12**. The gear box is such that output shaft **30** of the motor-gear box **29** will turn at a slow speed, e.g.,1 to 3 RPM. Connected to the output shaft **30** is a depending shaft **31** to which is adjustably secured a collar **32**. As best seen in FIGS. **4** and **8**, three spokes **34**, **35**, and **36** radiate from the collar **32** at positions 120° apart. These spokes **34**, **35**, and **36** are received through appropriate holes **14** in the cylinder **13**. And, in this manner, the cylinder **13** may be held in its operative position.

Referring now to FIGS. **4** and **5**, the benefits of the present unique preferred manner of constructing the fixture **10** can be noted. Firstly, the cylinder **13** is preferably made of some flexible and resilient opaque material such as metal or flexible plastic. And as best seen in FIG. **5**—because of the flexibility of the cylinder **13**—the cylinder can be rapidly mounted on the spokes **34**, **35**, and **36** even though these spokes are simple wire rods. More particularly, the cylinder **13** can be partially mounted on the spokes **34**, **35**, and **36** by inserting the spokes **35** and **36** through to appropriate holes **14**. Then, the cylinder **13** is flexed to an elliptical condition (shown in somewhat exagerated form in FIG. **5**). By this operation, the spoke **34** can be inserted throgh an appropriate hole **14**. Then, by merely releasing the cylinder **13**, the resiliency of the cylinder will return it to the round condition shown in FIG. **4**. And, this returning of the cylinder **13** to its round condition will automatically properly index the cylinder to a position concentric with the shaft **31**.

Conversely, when it is desired to remove the cylinder **13**, e.g., for the purpose of replacing the bulbs **12**, the cylinder **13** can be quickly removed by flexing the

cylinder to the elliptical condition to remove one of the spokes **34**, **35**, and **36** from the cylinder. And then, the cylinder **13** can be removed from the other two of the spokes **34**, **35**, and **36**.

And, it can be seen that merely removing the wing nuts **23** facilitates rapid attachment and removal of the enclosure **11**.

Referring now to FIGS. **6** to **8**, the structure of the enclosure **11** and the purpose of that structure will be described in further detail. In FIG. **6**, there is shown in more detail the exterior surface of a fragmentary portion of the enclosure **11**. The exterior surface of the enclosure **11** is preferably formed as a series of elongated prisms which are elongated generally parallel to the axis of rotation of the cylinder **13**, i.e., generally at a right angle to the movement of the holes **14** of the cylinder. In FIG. **6**, there is shown one prism **38** having a first face **39** and a second face **40** which project towards the viewer as they extend toward each other. Similarly, a second prism **41** has its first face **42** and its second face **43** project toward the viewer as they extend toward each other. And, third prism **44** similarly has its first face **45** and its second face **46** project toward the viewer as said faces extend toward each other.

As can also be seen best in FIG. **6**, the prisms **38**, **41** and **44** preferably do not have a constant cross section through their length. That is, the prisms **39** and **44** are wider at their lower end than their upper end whereas the prism **42** is wider at its upper end than its lower end. The other prisms of the enclosure **11** are preferably of the same construction.

Referring now to FIG. **7**, there is illustrated how light will be allowed to pass through two holes (indicated by the numbers **14***a* and **14***b*) in the cylinder **13** in light rays **48** and **49** respectively. Preferably, the distance between the holes **14***a* and **14***b* (which are the same as the distance between the other holes **14** of the cylinder **13**) are approximately equal to the lateral distance between the center lines of the prisms, e.g., prisms **38** and **41**. More particularly, when the cylinder **13** is in the position in FIG. **7**, the holes **14***a* and **14***b* are preferably spaced so that the light rays **48** will pass through the enclosure **11** and out through the face **39** of the prism **38** while the light rays **49** will pass out through the face **43** of the prism **41**.

As indicated by the arrow **50** in FIGS. **7** and **8**, the cylinder **13** is constantly moving laterally with respect to the enclosure **11**. In FIG. **8**, the structure is shown after the cylinder **13** is moved slightly from the position shown in FIG. **7** to a position where the light rays **48** through hole **14***a* now pass through the face **40** of the prism **38** while the rays **49** through the hole **14***b* pass through face **45** of the prism **44**. And, as illustrated in the FIGS. **7** and **8**, the refractive action of the prisms causes the constant velocity motion of the cylinder **13** to appear as a constantly varying velocity. Further, as best seen in FIG. **3**, the holes **14** are not in series of lines extending parallel to the axis of rotation of the cylinder **13**. Therefore, there is a constant rippling appearance of the lights **12** on the enclosure **11**.

While only a few embodiments of the present invention have been shown and described in detail, it will be apparent to those skilled in the art that such is by way of illustration only and numerous changes may be made thereto without departing from the spirit of the present invention. For example, in its broader form, the invention need not be limited to a cylindrical shape—e.g., the light interuption means and enclosure could be more spherical; however, such cylindrical shape does reduce cost of manufacture and facilitate use.

Also, the light interuption means need not be completely opaque with holes; but rather could merely have a large number of small areas which are more transparent than the other areas of the means. Accordingly, it is my intention that the invention be limited solely by the appended claims.

We claim:

1. A light fixture with changing light emission comprising:

a light source;

a large number of prisms surrounding said light source, said prisms being joined together in a prism assembly generally arranged about a predetermined axis;

light interuption means surrounding said light source at a position between said light source and said prisms, said light interruption means having a plurality of small areas which interupt the light substantially less than other areas on said light interuption means, said light interuption means comprising a circular member mounted on the same axis as said predetermined axis;

and power means to change the position of said light interuption means relative to said prisms.

2. The fixture set forth in claim **1** wherein:

said prisms are elongated in a direction extending at a right angle to the direction of movement of said light interuption means.

3. The fixture set forth in claim **1** wherein said prisms are elongated in parallel to said axis.

4. The fixture set forth in claim **1** wherein:

said power means constantly changes the position of said light interuption means in one direction around the light source;

and the distance between individual ones of said small areas in the direction of movement of said light interuption means is approximately equal to the distance between the center lines of two adjacent individual prisms in the direction of movement of the interuption means.

5. A light fixture with changing light emission comprising:

a light source;

a first set of prisms surrounding said light source;

light interuption means surrounding said light source at a position between said light source and said prisms, said light interuption means having a plurality of small areas which interupt the light substantially less than other areas on said light interuption means;

a second set of prisms arranged in a circle around said light source, said second set of prisms being located on the side of said first mentioned prisms away from said light source;

and power means to change the position of said light interuption means relative to said prisms.

6. A light fixture with changing light emission comprising:

a light source;

power means including a shaft which is rotated and a plurality of spokes radiating from said shaft at substantially a right angle to the shaft;

and light interuption means surrounding said light source, said light interuption means comprising:

a cylinder having a plurality of light conducting areas therein, which interupt the light substantially less than other areas on said cylinder, said cylinder being flexible so as to permit it to be flexed from a circular cross section to an elliptical cross section, said cylinder being mounted on said plurality of spokes by said spokes being received through different ones of holes in said cylinder, and said cylinder is adapted to be flexed to an elliptical shape in order to permit the cylinder to be mounted on said spokes.

7. The fixture set forth in claim 6 wherein said cylinder has a resiliency to return it back to its circular cross section, and said spokes are at least three spaced substantially equidistant apart, whereby the cylinder will tend to automatically orient itself concentric to said axis when the cylinder is released.

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