April 26, 1966 L. A. SKLAR 3,247,750

LIGHT DISPLAY MEANS

Filed Nov. 19, 1964

FIG. 1

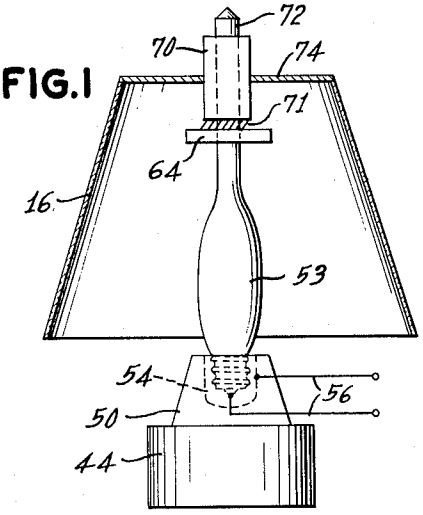
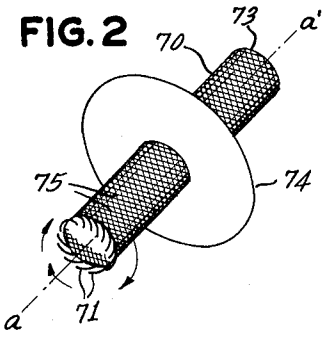


FIG. 2



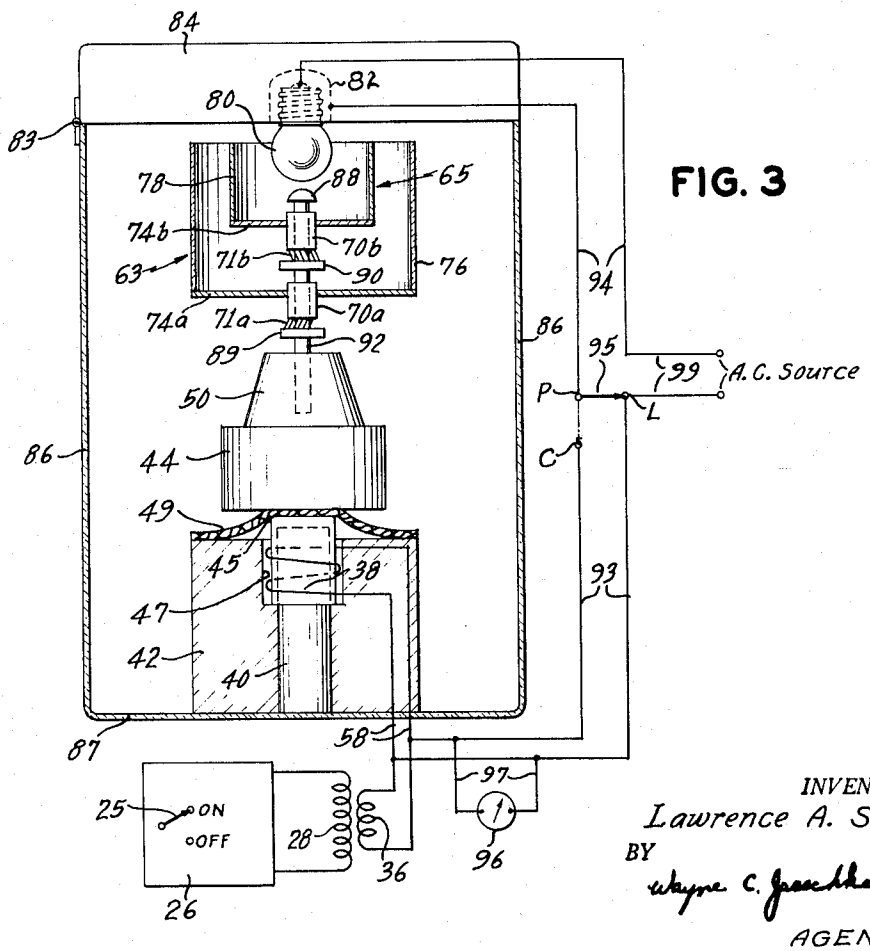


FIG. 3

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LIGHT DISPLAY MEANS

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This application is a continuation-in-part of my prior and co-pending application Serial Number 326,584, filed November 27, 1963, now Patent No. 3,205,755.

The present invention relates to light display means, and more particularly, it relates to a means suited to the production of a display of colored lights which changes in response to changing electronic impulses.

In the past, it has been known to employ audio amplification means to produce physical and mechanical excitation for diverse purposes. The telephony art contains many examples of such usage. Likewise, those skilled in the optical arts have produced numerous methods and means for achieving a moving display of colored lights for various utilitarian and aesthetic purposes. Unfortunately, the systems of the prior art are complex and consequently economically unattractive for most consumer or even commercial applications. In my prior and co-pending application I disclosed means for producing a display of colored lights responsive to changing electronic impulses which included a colored light shade movably mounted on a vibrating post and partially enclosing the light source. The disclosed embodiment of the movable mounting permitted restricted random motion of the shade about the vibrating post. I have now discovered a simple and workable means for converting the vibrational motion of the post into rotational motion in a colored light shade mounted for rotational motion around the post and a suitable light source.

It is, therefore, an object of the present invention to provide an extremely uncomplicated and inexpensive means for producing a moving display of colored lights responsive to changing electronic impulses which overcomes and eliminates the difficulties in the prior art. Another object is to improve the means disclosed in my prior and co-pending application referred to above.

Further objects and advantages will become apparent to those skilled in the art from the following description and reference to the drawings.

FIGURE 1 illustrates diagrammatically in elevation one embodiment of the light display means of the present invention.

FIGURE 2 illustrates an isometric view of the means of the present invention for producing rotational motion in a light shade responsive to changing electronic impulses.

FIGURE 3 illustrates diagrammatically in elevation another and preferred embodiment of the light display means of the present invention.

Reference is now made to FIGURE 1 which illustrates one embodiment of the present invention for converting the vibrational motion of post **72** into rotational motion in colored light shade **16** which is mounted for rotation around the post and light source to achieve a colored light display responsive to changing electronic impulses. Foam blocks **44** and **50** are positioned above and connected to the structure described in, and are set into motion in the same manner as is hereinafter described with reference to FIGURE 3. In FIGURE 1, a specially constructed bulb **53** fastened in socket **54** transmits the vibrational motion of the foam to the colored light shade. Bulb **53** is adapted with an elongated upper portion, post **72**, which has a smaller diameter than the lower portion of the bulb. Post **72** is snugly fitted with rubber washer **64**. Power is supplied to bulb **53** by means of electrical leads **56** connected to a suitable power source.

The light shade **16** is a three dimensional figure, namely, a cone of revolution truncated by disc **74**. The cone of revolution is composed of colored light filters, e.g., colored cellophane foil or any other suitable transparent or semi-transparent material arranged on the walls of shade **16** in any suitable design, such as is hereinafter described with reference to the practice of the present invention. In practice of this invention green, blue, and red cellophane foils were attached to the upper, middle, and bottom portions of the shade, respectively. The bottom diameter of the shade **16** is preferably left open to permit free and unrestricted movement of the shade. The design of a shade other than a cone of revolution, e.g., any geometrical figure which partially or completely envelopes the light source is contemplated within the scope of the present invention.

Tubular sleeve **70**, which has a bank of oriented fibers **71** depending therefrom as illustrated in FIGURE 2, is rotatably mounted around post **72**. The sleeve **70** communicates with washer **64** through the bank of oriented fibers **71** depending therefrom. Disc **74**, which forms the upper portion of light shade **16** is rigidly attached to sleeve **70**. Disc **74** is connected to the upper portion of light shade **16** such that shade **16**, disc **74**, and sleeve **70** rotate together around post **72**.

FIGURE 2 illustrates an isometric view of the construction of tubular sleeve **70** and shows its relationship to disc **74**, which elements provide means for achieving rotational motion of light shade **16** around a vibrating post and light source. Tubular sleeve **70** is made of fibers **75**, preferably durable synthetic fibers such as e.g., rayon acetate fibers, fashioned into an elongated fiber tube of extremely light weight. The fiber tube is cut to provide a section of the desired length. The fibers at the cut end remain closely integrated and appear smooth, e.g., end **73**.

When the smooth end of the tube is brushed either by hand or machine against a suitable abrasive surface, e.g., sandpaper, emery, or a metallic brush, the fibers are loosened from their tightly integrated pattern so they project from tube **70** in a direction generally parallel with longitudinal axis *a–a'*. If further brushing is carefully done with the abrasive surface and the abrasive surface is advanced around the periphery of the tube, e.g., in a clockwise direction as shown by the arrows, the projecting fibers can be oriented in the same generally tangential direction thereby providing a bank of uniformly oriented fibers **71**.

It has been discovered in the practice of the present invention that when vibrational motion is imparted to the bulb of special construction **53** and post **72** in FIGURE 1, the vibrational motion of the post is transmitted to tubular sleeve **70** through the bank of oriented fibers **71**. The bank of fibers **71** in dynamic communication with washer **64** cause sleeve **70** to be advanced in the direction toward which the fiber ends have been oriented, i.e., causing rotational motion of the sleeve around post **72**. Disc **74** is rigidly attached to tubular sleeve **70** by suitable means, e.g., glue or other adhesive material; and a light shade, e.g., shade **16** is rigidly attached to the disc. Disc **74** and light shade **16** can be caused to rotate around extension **72** achieving a changing display of colored lights as light filters of different colors arranged in any design desired on shade **16** pass in front of light bulb **53**. The rate of rotation is responsive to the frequency and amplitude of the vibrational motion of the post. The vibrational motion of the post is, in turn, responsive to changing electronic impulses as hereinafter described with reference to FIGURE 3. It should be apparent that the direction of rotation can be controlled by the particular orientation of the fibers in bank **71** either in a clockwise or counterclockwise direction, as desired.

Referring now to FIGURE 3, which illustrates another and preferred embodiment of the present invention, motion is imparted to foam blocks 44 and 50 responsive to the electrical output of audio amplifier 26 by the means contained in housing 42 in the following manner. The numeral 26 represents an audio amplifier which may be of any known construction. Switch 25 is positioned in the on position shown in the figure to activate amplifier 26. In this embodiment primary coil 28 is shown associated with the output of amplifier 26. It is to be understood, however, that depending upon the power output of the amplifier, any desired number of coils and transformers may be associated with the amplifier in order to operate a plurality of speakers and/or light display mechanisms.

Primary coil 28 is shown positioned in flux relationship with secondary coil 36 which is electrically interconnected in a series circuit with coil 38 by means of leads 58. Coil 38 is wound on a tube 45, which is constructed of light, rigid material, e.g., nylon, cardboard, or other strong, non-magnetic material. The coil 38 and tube 45 comprise an assembly situated around magnetic means 40, which can be a permanent or an electromagnet, and in close association therewith. This assembly is movably set within groove 47 in housing 42 such that when the current in coil 38 is changed by a change in the output of the audio amplifier 26, thereby producing a corresponding change in the magnetic field between the magnetic means 40 and coil 38, rapid vertical oscillation is imparted to the voice coil 38 and tube 45 assembly. A cloth mesh 49, or other suitable means communicating between housing 42 and tube 45 is provided to prevent the dislodging of tube 45 from groove 47.

It has been discovered in the practice of the present invention that the rapid motion of relatively minor amplitude imparted to coil 38 and tube 45 can be physically magnified by means of a mass of rigid, light-weight plastic foam material which is rigidly attached to tube 45. The foam also serves to absorb mechanical chatter. Suitable foam materials are, for example, polyurethane, and polystyrene. A block 44 of such rigid foam material, which in this case is polystyrene of about ½ inch thickness and one-inch in diameter is shown rigidly attached to the upper portion of tube 45. Polystyrene foam was chosen, e.g., because of its low specific gravity, dimensional stability, and low vapor absorption characteristics. The rigid attachment can be achieved by mechanical means although it is preferred to use a layer of bonding agent, e.g., glue or household cement. In this example, a second block of the same foam material 50 having about the same thickness as 44 but somewhat diminished in horizontal dimensions is shown situated on and rigidly attached to the top of block 44. In this case, foam blocks 44 and 50 form unitary rigid means for producing vibrations from the oscillations of tube 45.

Vertically elongated support post 92 is embedded in foam block 50 to provide rigid attachment therebetween. Post 92 is preferably made of light weight material, e.g., such as glass. First washer 89 is snugly fitted around a lower portion of post 92. Tubular sleeve 70*a* is rotatably mounted around post 92 above washer 89 and communicates therewith through a bank of oriented fibers 71*a*. Disk 74*a* is rigidly attached to an upper portion of tubular sleeve 70*a* such that the disk rotates with the sleeve. Colored light filters, e.g., a series of vertically elongated strips of green, blue, yellow, and red plastic filters are connected together to form a colored light cylinder 76. The bottom part of cylinder 76 is rigidly attached to the periphery of disc 74*a* thereby forming rotatably mounted light shade assembly 63 which resembles a cup in its upright position. Cylinder 76 forms a partial enclosure around a suitable light source, e.g., bulb 80. In another preferred embodiment, a second cup shaped light shade assembly 65 of reduced diameter is rotatably mounted around post 92. Washer 90 is snugly fitted around post 92 at a point above sleeve 70*a* to support assembly 65. The washers employed herein are preferably made of rubber or like material. Tubular sleeve 70*b* is rotatably mounted around post 92 above washer 90 and communicates with the washer through a bank of oriented fibers 71*b* which has been oriented for rotation by brushing in the opposite direction from fiber bank 71*a*. The cup shaped light shade assembly 65 is formed, in this case, by the intersection of disk 74*b* and cylinder walls 78 which are made from strips of colored light filters, if desired, in a manner like cylinder 76. Cap 88 prevents sleeve 70*b* from being dislodged by vibrations at the upper end of post 92. When vibrational motion is imparted to post 92 the rotatably mounted cup shaped light shade assembly 63 rotates, e.g., in a counterclockwise direction while the rotatably mounted cup shaped light shade assembly 65 rotates in a clockwise direction. The rates at which the cup shaped light filters spin are generally responsive to the output of audio amplifier 26.

The above described means shown in FIGURE 3 is enclosed in a suitable container, e.g., a vertically elongated cylinder having base 87 and side walls 86. The side walls 86 and base 87 preferably are made of a rigid, transparent or at least partially transparent material such as glass, polymethylmethacrylate, or polystyrene. Walls 86 form the support for cover means 84 which is connected thereto by means of hinge 83. The cover means 84 is also preferably made of plastic or like material. Electrical socket 82 is situated in cover 84. Light bulb 80, which in one operational model of the present invention was a 15 watt incandescent light bulb, is electrically interconnected with socket 82 and depends vertically downwardly therefrom into the upper open ends of the cup-shaped light shade assemblies 63 and 65.

The power needed to illuminate bulb 80 is derived from a suitable alternating current source directly through leads 99 and 94 when switch 95 is positioned between terminals P and L. If desired, however, switch 95 may be connected in the alternative position between terminals P and C shown by means of the broken lines. This arrangement connects coil 38 by means of leads 93 and 58 in series circuit with light bulb 80 on the same alternating current source. Switch 25 on audio amplifier 26 is turned to the off position in order to deactivate the amplifier. In this case, a variable resistor 96 is connected by means of leads 97 in parallel with coil 38. The assembly shown in FIGURE 3 was operated in this manner employing 110 volt, 60 cycle-per-second alternating current and a 50 ohm variable resistor. The coil 38 wound on tube 45 was caused to oscillate and consequently the cup shaped light shades were caused to rotate by reason of the alternating current drawn from the source. The amplitude of the oscillations of coil 38 and tube 45 can be varied by changing the resistance of resistor 96. Increased resistance decreases the spin rate of the rotatably mounted light filters. A constant rate of spin can be maintained, simply, by maintaining a constant resistance setting of variable resistor 96.

Many modifications and alterations of the present invention will become apparent to those skilled in the art without departing from the scope of the present invention which is limited only by the claims.

What is claimed is:

1. A system for producing a light display comprising in combination: unitary rigid means comprising a light weight plastic foam material, means for exciting vibrational motion in said unitary rigid means situated beneath and connected to said unitary rigid means, vertically elongated support means rigidly attached to said unitary means for transmitting vibrational motion of said unitary means to washer means, washer means snugly fitted around an upper portion of said support means, a tubular sleeve rotatably mounted around said support means above said washer means, a bank of oriented fibers depending from said tubular sleeve and communicating with said washer means to convert the

vibrational motion of said washer means into rotational motion in said sleeve, light shade means rigidly connected to said sleeve, and light source means at least partially enclosed by said light shade means.

2. A system for producing a light display comprising in combination: unitary rigid means comprising a light weight plastic foam material, means for exciting vibrational motion in said unitary rigid means situated beneath and connected to said unitary rigid means, vertically elongated support means rigidly attached to said unitary means for transmitting vibrational motion of said unitary means to washer means, washer means snugly fitted around an upper portion of said support means, a tubular sleeve rotatably mounted around said support means above said washer means, a bank of oriented fibers depending from said tubular sleeve and communicating with said washer means to convert the vibrational motion of said washer means into rotational motion in said sleeve, light shade means rigidly connected to said sleeve, light source means at least partially enclosed by said light shade means, and at least partially transparent light screen means forming a partial envelope about said light shade means.

3. A system for producing a light display comprising in combination: unitary rigid means comprising a light weight plastic foam material, means for exciting vibrational motion in said unitary rigid means situated beneath and connected to said unitary rigid means, vertically elongated support means rigidly attached to said unitary means for transmitting vibrational motion of said unitary means to washer means, said support means comprising light source means, washer means snugly fitted around an upper portion of said support means, a tubular sleeve comprising light weight synthetic fibers woven together rotatably mounted around said support means above said washer means, a bank of oriented fibers depending from said tubular sleeve and communicating with said washer means to convert the vibrational motion of said washer means into rotational motion in said sleeve, light shade means rigidly connected to said sleeve and adapted to form a partial enclosure of said light source means.

4. The system of claim 3 in which socket means for a light source is embedded in said unitary rigid means, light source means is connected in said socket means, said light source means having a vertically elongated upper portion which forms said support means for transmitting vibrational motion of said unitary means to said washer means.

5. A system for producing a light display comprising in combination: unitary rigid means comprising a light weight plastic foam material, means for exciting vibrational motion in said unitary rigid means situated beneath and connected to said unitary rigid means, vertically elongated support means rigidly attached to said unitary means for transmitting vibrational motion of said unitary means to washer means, washer means snugly fitted around an upper portion of said support means, a tubular sleeve comprising light weight synthetic fibers woven together rotatably mounted around said support means above said washer means, a bank of oriented fibers depending from said tubular sleeve and communicating with said washer means to convert the vibrational motion of said washer means into rotational motion in said sleeve, light shade means comprising a disc rigidly connected to said sleeve and cylindrical light filter means attached at the lower end thereof to the periphery of the disc thereby forming a rotatably mounted cup-shaped light shade assembly having an open upper end, and light source means projecting downwardly into the open upper end of said cup-shaped light shade.

6. The system of claim 5 in which a second cup-shaped light shade assembly having an open upper end is rotatably mounted on the same support means.

7. The system of claim 5 in which the elements defined therein are situated within a container, said container having side walls which provide an at least partially transparent screen means, a cover portion in hinged connection with the side walls of said container, said cover portion containing a socket means for light source means, and light source means connected in said socket means and projecting downwardly into said cup-shaped light shade.

8. A system for producing a display of colored lights responsive to changing electronic impulses which comprise in combination: a source of changing electronic impulses, housing means containing a magnet and forming the base for the assembly hereinafter recited, vertically disposed first rigid tubular means moveably mounted around said magnet in said housing means, coil means associated with said tubular means for producing vertical oscillation in said tubular means in co-action with said magnet responsive to the source of changing electronic impulses, unitary rigid means comprising a light weight plastic foam material rigidly attached to an upper portion of said tubular means, vertically elongated support means rigidly attached to said unitary means for transmitting vibrational motion of said unitary means to washer means, washer means snugly fitted around an upper portion of said support means, a tubular sleeve rotatably mounted around said support means above said washer means, a bank of oriented fibers depending from said sleeve and communicating with said washer means to convert the vibrational motion of said washer means into rotational motion in said sleeve, light filter means rigidly connected to said sleeve, and light source means at least partially enclosed by said light filter means.

9. The system of claim 8 in which the source of changing electronic impulses is an audio amplifier.

10. The system of claim 8 in which the source of changing electronic impulses is an alternating electrical current.

11. The system of claim 8 in which said light source means and said coil means associated with said tubular means are connected in series circuit with the same source of alternating electrical current, and a variable setting resistor is connected in parallel with said coil means.

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LEO SMILOW, *Primary Examiner.*