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INCANDESCENT LAMP WITH DIMMER

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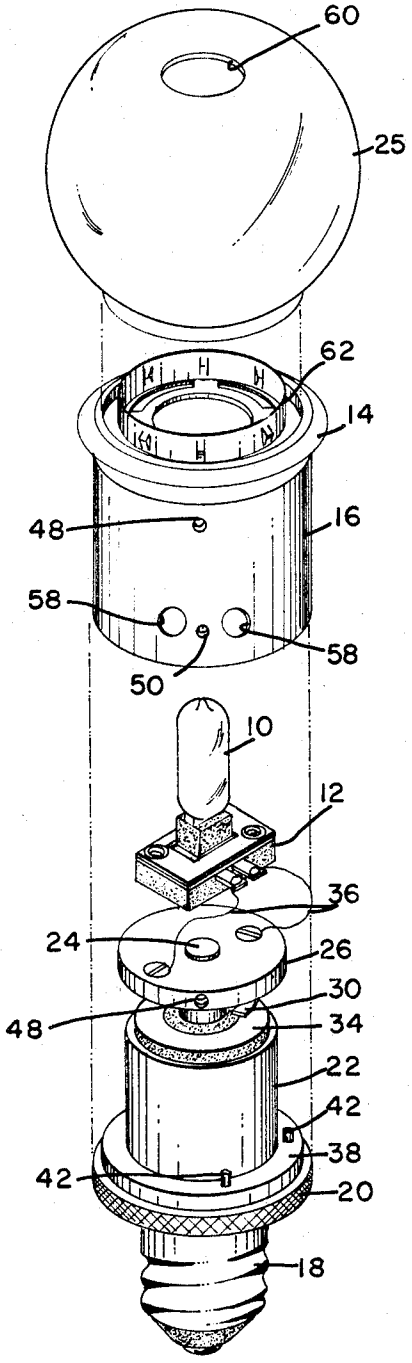


FIG. 1

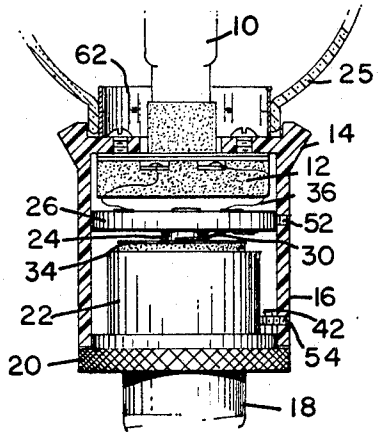


FIG. 2

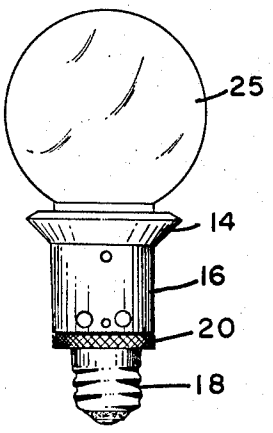


FIG. 3

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INCANDESCENT LAMP WITH DIMMER

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ABSTRACT OF THE DISCLOSURE

A dimming device utilizing a single-ended high intensity lamp wherein the lamp is electrically connected by way of a commutator and conductive ring to an internally potted dimmer circuit. An outer cannister surrounds the dimmer apparatus and is physically connected to the commutator, whereby rotation of the cannister will produce variation of light intensities of the lamp.

This invention relates to incandescent lamps and more particularly to lamps of the type having dimming means integral therewith.

Light intensity dimmers are utilized in many areas for "effect lighting" as well as practical features they afford, that is, the variable intensity of light can be adjusted to various light levels for different needs to accentuate a display or just merely reducing the glare for eye comfort.

Earlier incandescent dimmers consisted of a wall switch, the switch usually being made up of a series resistor or auto transformer type circuit. The selection of the desired light level was achieved by rotation of a knob that would control a contact arm or movable brush contact on the interior of the switch, the brush contact riding on a bared portion of a transformer winding to increase or decrease the voltage required. Progressive improvements in the cicuitry of the dimmer switch developed to a point where semiconductors are now widely used, thus simplifying the circuitry and making a more compact and efficient instrument for the consumer. Even with the present day improvements to the dimmer switch, the homeowner fails to install such switches within the home because of the high cost of installation and the inconvenience it is expected to entail.

My invention reduces these above-mentioned problems by providing a dimming arrangement integral with an incandescent lamp, thus eliminating any electrical wiring. The lamp I use is a high intensity single-ended quartz-iodine lamp fitted to a socket located at the top of an elongated outer shell or container, an internal mating container being fitted with a conventional Edison type lamp base. The inner container fitted within the upper container is utilized to house a semiconductor dimmer control arrangement. When fully assembled, the high intensity lamp, located in a conventional lamp socket at the top of the outer cannister, is covered with a frosted globe for light diffusion and to prevent accidental contact with the lamp. The lamp, the dimmer control and the conventional lamp base are all electrically connected to provide a convenient integral lamp structure with all advantages of a lamp dimmer switch. The many advantages of this type of structure are quite obvious in that the main feature is the lack of installation cost, the user merely using the dimmer lamp as a conventional lamp, by screwing the dimmer lamp into any conventional lamp socket as he would a standard incandescent lamp.

The convenient size of the complete dimmer lamp structure is slightly larger than a standard lamp and it will fit within most of the standard lamp frames or "harps" as they are referred to on the market. This in itself is a paramount feature. Simply by replacing the standard bulb with a dimmer lamp, the homeowner has

the advantage of controlled variable light level with no added cost of installation. High intensity lamp is known to have a much shorter life than the standard incandescent lamp but under this particular arrangement, the life of my lamp is lengthened considerably with the use of the dimming control unit. Replacement of the high intensity lamp after burn-out would be the only cost to the consumer, the remainder of the dimming unit, that is, the cannister housing, the dimmer control and the frosted globe, do not have to be replaced normal conditions.

Therefore it is an object of my invention to provide an incandescent lamp arrangement having an internal dimming switch integral with the lamp structure.

Another object is to provide a dimmer control to adjust the light levels of a high intensity incandescent lamp and be small enough to fit most standard harps.

And a still further object of the invention is to provide an arrangement whereby a high intensity lamp is adapted to a standard Edison base.

Other objects, features and advantages of this invention will become apparent to those skilled in the art upon reading the following specification when taken in conjunction with the accompanying drawings in which:

FIGURE 1 is an enlarged exploded view showing in particular the high intensity lamp and its integral socket.

FIGURE 2 is an enlarged cross-sectional view of the lamp structure.

FIGURE 3 is an elevational view of the completed lamp structure.

Referring to FIG. 1 which illustrates an exploded view of the lamp dimmer structure the high intensity lamp **10** is of the newly developed single-ended quartz-iodine type. This lamp has the flexibility of burning in any position rather than the former double ended counterpart that was restricted to burn only in a horizontal position. The lamp also has many other advantages; it is small in size and high in light output. In my structure I prefer to use a 300 watt quartz-iodine lamp for its particular size and high wattage; the size of the lamp is an important factor in my lamp structure. The complete lamp dimmer lamp must be small enough to fit within the majority of the present lamp harps.

As viewed in FIGS. 1 and 2, the lamp **10** is fitted into a lamp socket **12** that is centrally located in the apex of a cone-shaped extension **14** of an outer elongated cannister **16**. The outer cannister **16** can be fabricated from any workable material such as plastic etc., and the interior cavity is large enough to receive an elongated extension **22** of a standard Edison type base **18**. The base and the extension are separated by a knurled wheel **20** equal in diameter to that of the outer cannister **16**.

A centrally located shaft **24** extends from the base **18** up through and above the inner extension **22** where a commutator disc **26** is positioned at the upper end. The commutator disc **26** is fitted with a wiping blade **30** on its bottom surface that is in contact with a ring **34**, embedded in the top surface of a potted electrical circuit positioned in the extension **22** of the base. Commutator is electrically connected by wires **36** to the leads of the lamp **10** to electrically connect the base to the lamp over the intermediate commutator arrangement.

Inner extension **22** of the base **18** is provided with an immediate ledge or step **38** adjacent to wheel **20** the diameter of the ledge is equal to that of the inside diameter of the outer cannister **16**, upon the assembly of the lamp structure, the outer edge of the cannister **16** will abut the wheel **20** and will be guided by the ledge **38** as seen in FIG. 2. A pair of spaced apart pin-stops **42** are positioned on the top surface of the ledge **38**, the purpose of which will be described hereinafter.

Assembly of the above-described components is fully shown in FIGS. 2 and 3 where the outer cannister **16**

having a base 12 properly affixed to the top surface is fitted over the inside extension 22. Screw ports 48 and 50 are located in the outer cannister. A screw 52 is fitted in the port 48 and is received into a corresponding hole in a commutator disc 26 to securely hold the commutator to the outer cannister 16. A similar type screw 54 is fitted into the port 50 and is in line with the upstanding pin-stops 42 and is guided along a circular path between the pins 42 upstanding from the fixed base 18. Thus with this arrangement the outer cannister 16 holding lamp base 12 and lamp 10 and the commutator disc 26 can be rotated about the fixed base 18. It can be noted that the movement of the outer cannister 16 and its related parts as mentioned above the commutator disc is provided with a wiping blade 30 that is in contact with the ring 34 of the embedded electrical semi-conductor circuit. With this arrangement it can be seen that by rotation of the outer cannister 16 variable light levels can be achieved.

As noted above and as viewed in FIG. 3, the complete lamp assembly is shaped similar to a standard lamp but, as will be pointed out, has many advantages over the conventional lamp.

It is known that high intensity quartz-iodine lamps burn hotter than the conventional lamps used in the present day lamp fixture; therefore it is essential to protect the semiconductor control unit and the lamp shade, that will be positioned adjacent to the lamp, from damage. Therefore I provide adequate paths to dissipate the heat generated by the lamp 10. The lamp 10 initiates the convection of air current by drawing cooler air in through the holes 58 at the bottom of the outer cannister 16 over the semiconductor control unit and thence out through the top holes 60 located in the glass globe 25. Positioned on the interior of the cone-shaped extension 14, I provide a plurality of spring clips 62 adapted to retain a soft glass circular globe 25 used to diffuse the light of lamp 10 and also to protect the user from accidentally coming in contact with the hot lamp 10.

The dimming control unit I propose to use can be any conventional semiconductor circuit, for example, a circuit employing either symmetrical silicon switches which conduct in either direction when the trigger pulses or a logic diode similar to the type employed in my copending application filed June 28, 1965, Ser. No. 471,608 entitled "Incandescent Lamp."

It is apparent that changes and modifications may be made within the spirit and scope of the instant invention. It is my intent, however, to be limited only by the scope of the appended claims.

What I claim is:

1. A lamp assembly comprising: a high intensity light source including a substantially tubular envelope having a base on one end only; an outer cannister having a socket at one end, a conventional lamp base having a tubular extension smaller in diameter than said outer cannister; said base and said extension being separated by a disc equal in diameter to that of said outer cannister; a dimming control apparatus located within said tubular extension of said base and having a commutator spaced above; said tubular extension holding said dimming apparatus assembled to fit within said outer cannister thereby said disc abuts the bottom of said outer cannister, said dimming control apparatus being electrically connected by way of said commutator to said socket located in one end of said outer cannister wherein said socket is adapted to receive said base on said envelope and said base of said tubular extension being adapted to be received by a conventional receptacle.

2. A lamp assembly comprising: a high intensity light source including a substantially tubular envelope having a base on one end only; an outer cannister having a socket at one end, a conventional lamp base having a tubular extension smaller in diameter than said outer cannister; said base and said extension separated by a disc equal in diameter to that of said outer cannister; a dimming control apparatus located within said tubular extension of said base and having a commutator spaced above and connected to said outer cannister; said tubular extension holding said dimming apparatus assembled to fit within said outer cannister thereby said disc abuts the bottom of said cannister, said dimming control apparatus being electrically connected by way of said commutator to said socket located in one end of said outer cannister, said socket being adapted to receive said base on said envelope and said base of said tubular extension being adapted to be received by a conventional receptacle whereby rotation of said outer cannister will vary the light level of said high intensity lamp.

3. An incandescent dimming lamp assembly comprising: a high intensity light source including a substantially tubular envelope having a base on one end only; an outer cannister having a socket at one end, a conventional lamp base having a tubular extension smaller in diameter than said outer cannister; said base and said extension separated by a disc equal in diameter to that of said outer cannister; a dimming control apparatus located within said tubular extension of said base and having a commutator spaced above and connected to said outer cannister; said tubular extension holding said dimming apparatus assembled to fit within said outer cannister thereby said disc abuts the bottom of said outer cannister, said dimming control apparatus being electrically connected by way of said commutator to said socket located in one end of said outer cannister, wherein said socket being adapted to receive said base on said envelope and said base of said tubular extension being adapted to be received by a conventional receptacle.

4. A lamp assembly comprising: a high intensity light source including a substantially tubular envelope having a base on one end only; an outer cannister having a socket at one end, a conventional lamp hase having a tubular extension smaller in diameter than said outer cannister; said base and said extension separated by a disc equal in diameter to that of said outer cannister; a dimming control apparatus potted in said tubular extension of said base and having an exposed conductive ring and a spaced apart commutator switch; said tubular extension holding said dimming apparatus assembled to fit within said outer cannister thereby said disc abuts the bottom of said outer cannister, said dimming control apparatus located in said tubular extension and being electrically by way of said conductive ring and said commutator connected to said lamp socket; said socket of said outer cannister being adapted to receive said base on said lamp envelope and said base of said tubular extension being adapted to be received by a conventional receptacle, whereby rotation of said outer cannister will vary the light level of said high intensity lamp.

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