June 28, 1955 G. W. CRESSMAN 2,711,640

VENTED FLASH LAMP BASE

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Fig. 1.

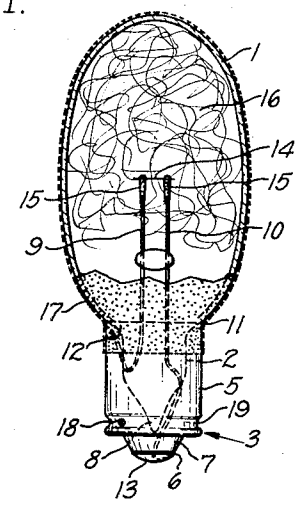
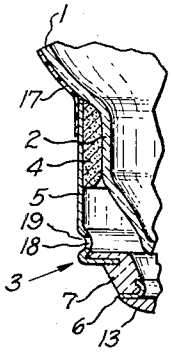


Fig. 2.



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VENTED FLASH LAMP BASE

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3 Claims. (Cl. 67—31)

The present invention relates to photoflash lamps of the type comprising a combustible material and a supporter of combustion within a sealed glass bulb and useful for flash photography.

Heretofore the glass bulbs of such lamps have been provided with a lacquer coating on the inner and outer surfaces of the glass bulb for various purposes, including the purpose of strengthening the bulb against explosive forces when the lamp is flashed. The tendency in this art is toward smaller sizes of lamps for convenience in handling, and one type of such lamp, now commercially available, is known as the M–2 photoflash lamp which is about 1¾ inches in length over-all and about ¾ inch in maximum diameter.

The M–2 lamp is provided with an external transparent lacquer coating only because of the difficulty involved in placing a lacquer coating evenly on the inner surface of the small bulb during manufacture.

All such lamps are provided with a base having a metal shell with a rim abutting against the glass bulb of the lamp. In the M–2 type of photoflash lamp the base is cemented to the bulb in the usual manner and the external lacquer coating is then applied by dipping the lamp, base-end up, in a bath of the lacquer and a vaporizable solvent to cover the entire exposed outer surface of the bulb, the juncture between the bulb and the base, and a small area of the base bordering the juncture.

During the subsequent drying of the external lacquer coating on the lamps, the coating at the juncture of the bulb and the base frequently becomes bubbly, resulting in a defective lamp which is not commercially desirable and must be discarded. Not only is the appearance of such a lamp undesirable commercially, but also the bubbling of the lacquer at the juncture tends to weaken the lamp. Such a lamp is more susceptible to shattering under the explosive forces generated in the bulb during flashing.

The principal object of the present invention is to obviate the formation of bubbles in the lacquer coating at the juncture of the base and the bulb of photoflash lamps of the type described above. Further objects and advantages will appear from the following description of a species of the invention.

U. S. Patent No. 2,337,485, patented December 21, 1943 by George H. Meridith and assigned to the assignee of this application, discloses and claims a photoflash lamp having an external lacquer coating absorptive of visible light and transmissive of invisible radiations, such as infrared and/or ultraviolet rays. The lacquer coating of the patented photoflash lamp is applied as described above, and the problem of bubbling of the lacquer at the juncture of the rim of the base shell and the bulb was encountered. The difficulty was cured as described in the Meridith patent by providing a fillet of resin, shellac, lacquer, or the like, to fill the space and the corner between the rim of the base shell and the bulb. The fillet of the Meridith lamp is applied to the juncture by painting or rolling and, after it has dried, the visible light absorbing lacquer is then applied to the lamp by immersing the lamp in a bath of lacquer.

Obviously, the steps of applying the fillet to the juncture and thereafter drying it add to the manufacturing cost of the lamp and are time consuming.

I have discovered that these steps can be eliminated completely to reduce the cost and speed up the production of lamps having bubble-free, external lacquer coatings by venting the interior of the base while dipping the lamp in the lacquer bath and drying the so applied coating on the lamp.

I have observed that in the manufacture of prior lamps having unvented bases and not provided with the fillet of the Meridith patent, bubble formation in the external lacquer coating begins immediately on removal of the lamp from the lacquer bath. This is caused by the evaporating solvent entering the base and increasing the total pressure therein above atmospheric pressure. Bubble formation takes place in the lacquer coating at the juncture of the bulb and the rim of the base as this total pressure seeks release.

The vent provided in the base in accordance with the present invention prevents the total pressure in the base exceeding atmospheric pressure at any stage of the coating and drying operation and thus prevents in positive manner any tendency toward bubble formation in the lacquer coating.

In accordance with my discovery of the cause of the difficulty, a vent in the form of a small opening punched in an uncoated part of the base shell is provided to prevent the total pressure in the base exceeding atmospheric pressure at any stage of applying and drying the lacquer coating on the lamp. I have demonstrated that when the interior of the base is so vented bubbling of the lacquer coating at any coated part of the lamp does not occur.

As a result of my discovery, the shrinkage, or number of rejects, of M–2 lamps from this cause in manufacture has been completely eliminated without need for the additional time consuming and cost adding steps of applying a fillet to the juncture and drying the fillet before application of the external lacquer coating to the lamp.

Prior to my discovery, and without using a fillet as described by Meridith, the shrinkage of the M–2 lamp during manufacture from bubbling of the lacquer at the juncture was approximately 20 per cent. Obviously, the elimination of such shrinkage effects a substantial saving in the manufacturing cost of the lamps. In photoflash lamps intended for retail sale at a lower price than any such lamps now on the market, it can be readily appreciated that a shrinkage of 20 per cent cannot be tolerated.

In the drawing accompanying and forming part of the specification, a photoflash lamp embodying the invention is shown in which:

Fig. 1 is an elevational view of the lamp;

Fig. 2 is a fragmentary sectional view of a portion of the lamp shown in Fig. 1.

Referring to the drawing, in which like numbers denote like parts in all the figures, the lamp comprises a glass bulb 1 having a neck portion 2 to which a hollow composite base 3 is attached by a ring or layer of basing cement 4 (Fig. 2). The said base comprises a metal shell contact portion 5 provided at one end thereof with a bottom or center metal contact eyelet 6 secured to shell 5 by a ring or button 7 of electrically insulating material, such as glass. The opposite or open end of the base shell 5 surrounds the neck 2 of the bulb 1 and is secured thereto by the basing cement 4 which is disposed in the annular space between the bulb neck and the surrounding portion of the base shell. The basing cement 4 mechanically joins the bulb neck and the base shell but does not hermetically seal the space therebetween. It may comprise a mixture of synthetic resin, such as Bakelite, rosin; a filler such as marble flour; a binding agent such as shellac, and alcohol.

The bulb 1 is provided with a sealed exhaust tubulation 8 extending outwardly from the neck end of the bulb, and a pair of current leading-in wires 9 and 10 are sealed between the exhaust tubulation and the said bulb neck, this being the conventional butt-seal structure.

The outer ends of the leading-in-wires 9 and 10 are connected to the metal shell 5 and the contact eyelet 6, respectively, of the lamp base 3. The wire 9 is bent toward the rim 11 of the base shell 5, extends through a notch therein and is soldered, as shown at 12 (Fig. 1), to the exterior surface of the shell 5 in the usual manner. The rim 11 of the shell 5 butts against the outer wall of the bulb 1. The wire 10 extends through the eyelet 6 and is soldered thereto as shown at 13.

Disposed within the bulb 1 is an ignition filament 14 which is connected to and supported by the inner end portions of the leading-in wires 9 and 10. The inner ends of the said leading-in wires and the adjacent portions of the filament 14 are coated with a suitable fulminating substance or primer 15.

The bulb 1 may be filled with a quantity of readily combustible flash material 16 loosely arranged in the bulb within effective ignition range of the ignition filament 14 and primer 15. The combustible material 16 may consist of leaf foil, wire, or shredded foil of aluminum and/or magnesium, or alloys thereof. The bulb 1 also contains a filling of oxygen which, in the M–2 lamp, is at a pressure of approximately 700 mm.

Ignition of the lamp is accomplished by impressing a suitable current across the leading-in wires 9 and 10 to heat the filament 14 which ignites the primer 15 which in turn ignites the combustible material 16 which produces a flash of actinic light of high intensity.

In order to strengthen the bulb 1 against explosive forces generated therein on ignition of the combustible material 16, a transparent continuous coating 17 of lacquer is applied in the manner described above over the entire exposed surface of the glass bulb 1 as well as over the juncture between the bulb and the rim 11 of the shell contact 5 of the base 3. The coating 17 also extends over a portion of the shell contact 5 adjacent the rim 11 thereof and covers the soldered connection shown at 12 in Fig. 1 of the drawing. The thickness of the coating 17 is exaggerated in Fig. 2 of the drawing and the coating is shown in section as a broken line in Fig. 1, though it will be understood that it is continuous.

The coating 17 covering the soldered connection 12 and the juncture between the bulb 1 and the base rim 11 seals the openings into the base 3 at these parts. Frequently enough to cause the substantial shrinkage mentioned above, the other joints of the base, such as those between the glass insulator 7 and the contacts 5 and 6, are also sufficiently airtight to make the entire base, at this stage in the manufacture of the lamp, airtight.

As pointed out above, in order to eliminate the formation of bubbles in the coating 17 at the soldered connection 12 and the juncture between the bulb 1 and the base rim 11 by the building up of a total pressure in the base 3 higher than atmospheric pressure during dipping of the lamp and drying of the coating 17, I have provided a vent 18 in the uncoated annular groove portion 19 of the outer shell contact 5.

The vent 18 is made by punching an opening through this portion 19 of the base shell 5 with a punch similar in size to a steel phonograph needle. The punching operation is done preferably before the basing cement 4 is applied to the inner surface of the shell 5 adjacent its rim and, of course, before the base 3 is secured to the neck 2 of the bulb 1 of the lamp by the cement. This is the preferred and at present the most economical method of providing the vent 18 in the base, but it will be understood that I contemplate that the vent 18 may be provided by other methods in other locations and at any stage in the manufacture of the base 3 or

of the lamp prior to the dipping of the lamp in the lacquer bath to apply the coating 17.

The material of the coating 17 may be a transparent methacrylate. Preferably, a coating of transparent isobutyl methacrylate, such as Lucite No. 45, is used. The lacquer bath in which the lamp is dipped in applying the coating 17 may have the following composition in percentages by weight:

	Per cent
Methacrylate resin	15–45
Acetone	85–55

The preferred composition of the bath in percentages by weight is the following:

	Per cent
Isobutyl methacrylate	38
Acetone	62

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A photoflash lamp comprising a sealed glass bulb, light producing means in said bulb, a composite hollow base secured to said bulb with a rim thereof substantially abutting against the wall of said bulb, the components of said base being united to each other in an airtight manner and a continuous coating of strengthening lacquer covering the exposed surface of said bulb, the juncture between said bulb and the rim of said base and the rim portion of said base, the interior of said base being vented to eliminate the formation of bubbles in said coating at said juncture during application of said coating to said lamp.

2. A photoflash lamp comprising a sealed glass bulb, light producing means in said bulb, current leading-in wires extending from said bulb, and a composite hollow base secured to said bulb about said leading-in wires and with a rim thereof substantially abutting against the wall of said bulb, the said base rim having a notch therein and an end of one of said leading-in wires being bent over said rim at said notch and united with the exterior surface of said base, the components of said base being united to each other in an airtight manner, and a continuous coating of strengthening lacquer covering the exposed surface of said bulb, the juncture between said bulb and the rim portion of said base including said notch, the interior of said base being vented to eliminate the formation of bubbles in said coating at said juncture and at said notch during application of said coating to said bulb.

3. A photoflash lamp comprising a sealed glass bulb, light producing means in said bulb, current leading-in wires extending from said bulb, a composite hollow base comprising a hollow metal shell contact and an insulated center metal contact secured to said bulb about said leading-in wires and with a rim of said shell contact abutting against the wall of said bulb and being notched, one of said leading-in wires being united with said center contact and another of said wires being bent over the rim of said shell at said notch and united with the outer surface of said shell contact, the said components of said base being united to each other in an airtight manner, and a continuous coating of strengthening lacquer covering the exposed surface of said bulb, the juncture between said bulb and the rim of said base shell contact and the rim portion of said base shell contact including said notch, the said shell contact having an opening in its side at an uncoated portion thereof to vent the interior of said base and thereby eliminate the formation of bubbles in said coating at said juncture and said notch during application of said coating to said lamp.

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