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PHOTOFLASH LAMP HAVING AN ANTI-STATIC COATING

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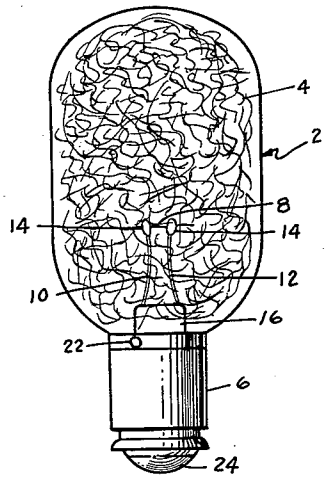

fig-1

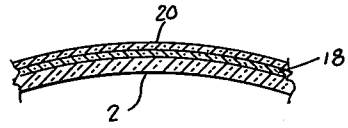

fig-2

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PHOTOFLASH LAMP HAVING AN ANTI-STATIC COATING

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This invention relates to the manufacture of photoflash lamps. Inadvertent ignitions, particularly those resulting from electrostatic discharges, have been a problem in the manufacture and handling of photo-flash lamps for many years. A number of different techniques have been employed at various stages of lamp manufacturing operation to minimize these inadvertent ignitions and they have been reasonably satisfactory.

With the commercial introduction a few years ago of the first zirconium-filled types of photoflash lamps, another aspect of this problem of inadvertent ignitions presented itself. Tests indicated that zirconium-filled lamps are more of a problem than the aluminum-filled lamps because of a high susceptibility to static ignitions coupled with the fact that they are more likely to chain react once ignited. In view thereof, one of the principal objects of this invention is to minimize inadvertent ignitions of photoflash lamps. Another principal object of this invention is to include in the finished photoflash lamp means for minimizing inadvertent ignitions so that the finished lamp will be so protected from the time the manufacture thereof has been completed until it has been actually used by the ultimate purchaser or user.

I have found that while not all electrostatic discharges likely to ignite lamps are due to low electrical conductance normally found in the exterior lacquer coating with which many photoflash lamps are provided, a large part of the difficulty centers here. Thus any means by which this conductance may be increased substantially is likely to reduce static generation rates and maximum voltages resulting under any given set of conditions. I have found that certain anti-static materials, compatible with the protecive lacquer coating with which the exterior surface of the lamp envelope is provided, effect these desired improvements.

The protection resulting from anti-static coatings is related to the amount of material used. While some benefits are derived from partial coverage, it is preferable to traet most of the lacquered bulb surface. Where charges may be induced within the lamp, on the metal parts for example, as a result of electrical charges on nearby objects, it is more desirable to provide a complete coating of the lamp surface including at least one of its external electrical contacts. An electrical path to ground will then be available for neutralization of such charges when any portion of the lamp contacts a grounded conductor, even though the latter may have very high electrical resistance. When anti-static coatings do not touch the external electrical contacts of the lamp, any potentials which may accumulate within the lamp cannot escape to ground until the contacts themselves are electrically grounded. In the case of photoflash lamps, the electrical resistance of anti-static coatings is too high to interfere with normal operation of the lamp through a short circuit of the lamp contacts, as might be expected to result from a complete coating.

In the accompanying drawing illustrating a specific embodiment of my invention, FIGURE 1 is an elevational view of a photoflash lamp and FIGURE 2 is a fragmentary sectional detail on an enlarged scale of a portion of the lamp envelope showing a layer of protective lacquer coating thereon and a layer of anti-static coating over the layer of protective lacquer coating.

The photoflash lamp illustrated in FIGURE 1 comprises an hermetically sealed, glass, light-transmitting envelope 2, provided with a filling of combustion-supporting gas such as oxygen and a filling of combustible, such as shredded aluminum or zirconium foil 4. The envelope 2 is provided with a base 6 affixed to the neck thereof. A tungsten filament 8, supported by lead-in wires 10 and 12, is disposed within the envelope 2. The inner ends of the lead-in wires 10 and 12 are provided with a quantity of ignition paste 14. The lead-in wires 10 and 12 are supported within the envelope 2 by stem 16 and are connected to conventional lamp contacts 22 and 24 in the usual manner.

As shown in FIGURE 2, the lamp envelope 2 is provided with a conventional protective lacquer coating 18 and an anti-static coating 20 thereover. The protective lacquer coating 18, usually cellulose acetate, is provided in order to minimize the possibility of bulb fragmentation when the lamp is fired. The anti-static coating 20 is a film of anti-static material compatible with the protective lacquer coating 18. The coating 20 is preferably applied, by dipping or spraying for example, after the lamps have been provided with a conventional protective lacquer coating 18, although anti-static materials compatible with the lacquer coating may be mixed therewith and a single, dual-purpose coating may be applied if desired.

Although a number of different commercially available anti-static materials may be employed, best results from the viewpoint of lamp performance as well as anti-static effectiveness are obtained with anti-static materials which will wet the lacquer coating well without producing objectionable cloudiness, resist normal handling, will not increase the likelihood of lamp explosions and at the same time produce a decided reduction in electrostatic charge accumulation and associated high flash rate. Statikil, manufactured by Statikil, Inc., Cleveland, Ohio, has been found to give very good results. This material is preferably diluted at the rate of 1 part to 15 parts of isopropyl alcohol by volume and applied to the lamps in a dipping process as they emerge from the lacquer drying ovens.

Another anti-static material which has been found to produce a decided reduction in electrostatic charge accumulation and associated high flash rate is Catanac SP made by the American Cyanamid Company.

What I claim is:

1. A photoflash lamp comprising: an hermetically sealed, light-transmitting envelope; a source of actinic light disposed within said envelope; a protective, light-transmitting, lacquer coating on the outer wall of said envelope; and a coating of a light-transmitting, anti-static conductive material, compatible with said lacquer coating and covering substantially the entire surface of the outer wall, over said lacquer coating.

2. In a photoflash lamp having an hermetically sealed light-transmitting envelope and a pair of electrical contacts external of said envelope, the combination of: a protective, light-transmitting, lacquer coating on the outer wall of said envelope; and a coating of light-transmitting anti-static conductive material substantially coextensive with said outer wall, compatible with said lacquer coating, over said lacquer coating and extending into electrical contact with at least one of said electrical contacts.

3. A photoflash lamp comprising: an hermetically sealed, light-transmitting envelope; a source of actinic light disposed within said envelope; and a light-transmitting coating on the outer wall of said envelope substantially coextensive with said outer wall, said coating consisting essentially of a mixture of a protective lacquer and an anti-static conductive material compatible therewith.

4. A photoflash lamp as defined in claim 3 and in which

the said coating extends into electrical contact with at least one of the external electrical contacts with which said lamp is provided.

5. A photoflash lamp comprising: an heremetically sealed light-transmitting envelope; a filling of zirconium foil disposed within said envelope, said foil providing a source of actinic light; a protective, light-transmitting, lacquer coating on the outer wall of said envelope; and a coating of a light-transmitting; anti-static conductive material, compatible with said lacquer coating, over said lacquer coating and covering substantially the entire surface of said outer wall.

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