

[54] **SHATTER-RESISTANT
INCANDESCENT LAMP**

[75] Inventors: **Emery G. Audesse**, Salem; **Alexander Tartakoff**, Beverly; **John K. Robertson**, Lynn, all of Mass.

[73] Assignee: **GTE Sylvania Incorporated**

[22] Filed: **July 1, 1971**

[21] Appl. No.: **158,712**

[52] U.S. Cl.117/72, 117/94, 117/124 F,
313/315, 313/317
[51] Int. Cl.C03c 17/30, F21v 3/04
[58] Field of Search117/124 F, 124 E, 94, 72

[56] **References Cited**

UNITED STATES PATENTS
3,629,228 12/1971 Hartlein et al.117/124 F X

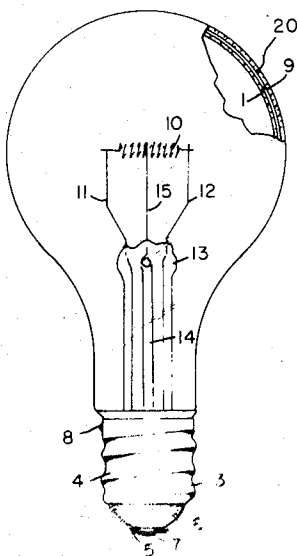
3,420,694	1/1969	James	117/94 X
3,117,245	1/1964	Ehrreich	117/72 X
3,018,187	1/1962	Boyce et al.	117/72 X
3,156,107	11/1964	Shaffer	117/124 E
3,102,049	8/1963	Quirk	117/124 F X

Primary Examiner—Ralph Husack
Attorney—Norman J. O'Malley et al.

[57] **ABSTRACT**

An electric lamp having a glass envelope with a tacky, shatter-resistant silicone rubber coating over the envelope and a coating over that of a hard, heat resistant silicone material to resist the accumulation of dust on the tacky coating.

2 Claims, 1 Drawing Figure



SHATTER-RESISTANT INCANDESCENT LAMP**BACKGROUND OF THE INVENTION****1. Field of the Invention**

This invention relates to electric lamps, and particularly to such lamps coated on the outside to prevent shattering or breakage. It is particularly adapted to lamps in bulbs of glass or the like.

2. Brief Summary Of Prior Art

It had previously been suggested to coat the lamps with a silicone rubber film to hold the glass pieces together on breakage. This had been satisfactory in respect to reducing or eliminating scattering, but the film was of a soft, tacky nature and dust collected on it and adhered so firmly that it could not be removed. This darkened the bulb and reduced its light output; when used in subway systems, where the passing trains stir up an atmosphere of dust, the lamps have been found to lose 80 or 90 percent of their light output, and in fact the light output would become so low that it would seem to have been turned off.

The use of a hard, non-tacky coating instead of the tacky silicone rubber was not effective in reducing shattering.

BRIEF SUMMARY OF INVENTION

However, we have discovered that if a hard, non-tacky coating is used over the tacky coating, it does not interfere with the shatterproofing effect of the silicone rubber, but does provide a hard, polished-looking surface to which dust will not readily adhere, and from which any dust which does appear can be easily wiped off with a cloth or the like.

The hard, non-tacky material should be heat-resistant, at least to the operating temperature of the bulb, and compatible with the tacky undercoat. We have found Dow Corning Silicone resin XR-4-3095 to be very effective.

The resultant doubly-coated lamp has a very glossy surface, and if the undercoat is clear, will be so invisible the coating will not be noticeable, but the outside of the bulb will appear to be merely an uncoated glass envelope. Dust, dirt, grime, fingerprints, scratches and mar marks can easily be removed from the coating. The lamp is very effective in withstanding the dusty atmosphere of a subway in a transportation system.

BRIEF DESCRIPTION OF DRAWING

Other features, objects and advantages of the invention will be apparent from the following specification, taken in connection with the accompanying drawing, which shows a lamp according to the invention, partly in section.

DETAILED DESCRIPTION OF EMBODIMENTS

In FIG. 1, the glass bulb 1 has the translucent coating 2 of plastic over its outer surface, and the usual screw base 3 at one end. The base 3 has the threaded metal shell 4. The eyelet contact 5 and the glass piece 6 insulates the eyelet contact 5 from the metal shell while supporting it therefrom. The usual lead-in wires, not shown since they are inside the base, terminate in the solder drops 7, 8, which affix them to the base contacts, one lead-in wire to each contact.

The bulb envelope 1 carries a clear, transparent coating 9 of a tacky silicone rubber, and over that a coating 20 of a hard heat-resistant silicone material, the lamp filament 10 being visible through the coating 9 and ready for use as substantially a point source. Any of the usual filament types can be used, for example, a coiled-coil of tungsten wire, held near its ends by the support and lead-in wires 11, 12, which extend through the press 13 of stem 14 in the usual manner. The opening 15 in the stem is in communication with the exhaust tube 16, which is used in manufacture for evacuation and gas-filling of the bulb 1, but in the finished lamp described as sealed off within the base 3. Tungsten support wire 15 extends from the press 13 to be looped around the filament 10 in the usual manner. The bulb will generally be filled at slightly below atmospheric pressure with nitrogen, argon, krypton or some other gas inert with respect to the tungsten filament 10.

The filament 10 becomes incandescent in the usual manner when a current is passed through it. For this reason, it is generally called an incandescent or incandescible filament.

The bulb 1 is coated with a clear silicone rubber. We have found the material marketed by Dow Corning Corporation, Midland, Michigan, as "Silastic 2288", a 25 percent dispersion by weight of silicone rubber in xylene, to be quite effective. The thickness of the coating can be varied with the size of the bulb. We have found a coating about 0.004 inch thick to be very effective for the A-19 bulb, that is a bulb of the shape shown in the drawing and nineteen-eighths inch in diameter, that is 2 3/8 inches, and a coating of about 0.015 inch thick to be better for the PS-30 bulb, that is the usual pear-shaped bulb about thirty-eighths inch in diameter, that is 3 3/4 inch diameter. The bulb sizes are given in eighths of an inch in accordance with the usual lamp practice.

The bulb can be coated by dipping it in the dispersion given above, and afterward dried.

After the bulb is coated with the silicone rubber 9, it is air dried and desolvated, and the overcoat 20 applied, or if desired, the coating 9 can be fully cured before applying the overcoat 20.

The material of the overcoat 20 can be a Dow Corning Silicone resin XR-4-3095. It is used as a clear water-white liquid. At room temperature of 20° C this material takes 29 seconds to efflux through a No. 1 G.E. Zahn Cup (viscosity relationship measurement). As such, this can be sprayed on the lamp, flowed on the lamp, or the lamp can be dipped into it. This material could be more viscous, but this would lead to putting on a thicker coat than necessary and increase costs. The optimum thickness for this glossy overcoat is 0.5 mil.

Then, after a 3 - 5 minute air dry and desolvation of the overcoat, we can pass the lamp with both coats through the curing oven (30 minutes at temperature 175° to 185° C) after which, the lamp is tested by lighting it and packed.

This overcoat will withstand the same temperatures that the regular undercoat will withstand — namely, 400° to 450° F for extended periods (2,000 hrs.).

Tested in a fairly clean environment, we see the following after 200 hours burning:

1. Lamps with the silicone rubber coat only show a 3.78 percent loss in light output.

3

2. Hard overcoated lamps show a 1.27 percent loss in light output.

The difference is much greater in a dusty atmosphere such as a subway, that is, the lamps with the silicone coating show a much greater loss in light output than the 3.78 percent in the above test.

The visual appearance of the tested lamp gives a much sharper advantage to the hard overcoat — it still has a clean, clear look and if some dust does settle on top, it can easily be blown or wiped off, while the plain silicone rubber coating does attract and hold dust and no amount of wiping, dusting or blowing will return it to its fresh condition.

Other modifications will be apparent to a worker

4

skilled in the art from the foregoing description, without departing from the spirit and scope of the invention, which is intended to be limited only by the claims.

What we claim is:

1. An incandescent electric lamp including an enclosing envelope, a first coating of clear tacky silicone rubber over said envelope to reduce shattering of the glass on impact, and a second clear coating of a hard, heat-resistant silicone over said first coating to reduce the adherence of dust.

2. The lamp of claim 1, in which the lamp is an incandescent lamp having a globular envelope.

* * * * *

15

20

25

30

35

40

45

50

55

60

65