United States Patent [19]

Notelteirs et al.

[11] **3,784,861**

[45] **Jan. 8, 1974**

[54] **LAMP WITH OPAQUE SCREEN**

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[73] Assignee: **U.S. Philips Corporation,** New York, N.Y.

[22] Filed: **Feb. 25, 1971**

[21] Appl. No.: **119,021**

Related U.S. Application Data

[62] Division of Ser. No. 805,309, March 7, 1969, abandoned.

[52] **U.S. Cl.** **313/117,** 117/97, 313/221

[51] **Int. Cl.** **H01j 5/08,** H01j 61/40, H01k 1/26

[58] **Field of Search** ..... 313/112, 116, 117, 313/221; 106/47 R; 117/97

[56] **References Cited**

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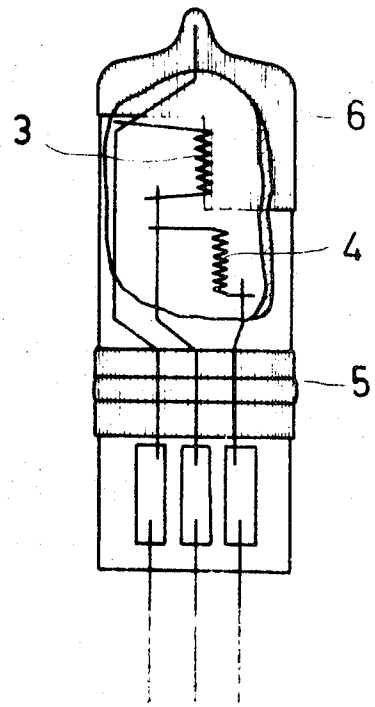
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Primary Examiner—Alfred L. Brody
Attorney—J. David Dainow

[57] **ABSTRACT**

A halogen incandescent lamp having on a portion of the bulb a black opaque coating of silicon and silicon dioxide.

5 Claims, 2 Drawing Figures



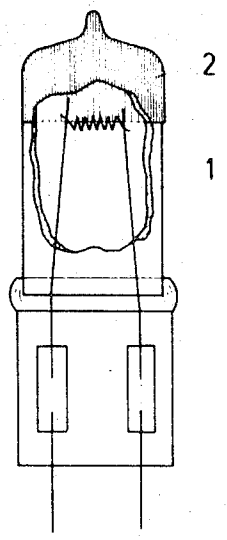


fig.1

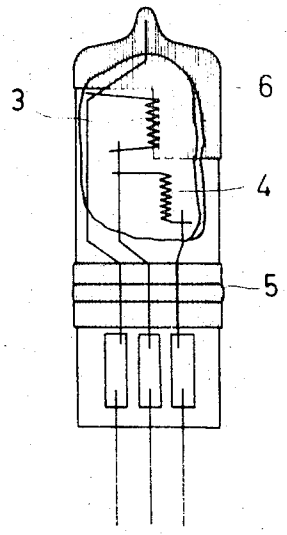


fig.2

LAMP WITH OPAQUE SCREEN

CROSS REFERENCE

This is a division of Applicants'co-pending application Ser. No. 805,309, filed Mar. 7, 1969, now abandoned.

The invention relates to a method of manufacturing a halogen incandescent lamp having a quartz envelope in which a part of the radiated light is screened. A halogen incandescent lamp is to be understood to mean in this connection an incandescent lamp having an envelope of comparatively small dimensions in which a filament is arranged in an atmosphere which contains a halogen. Such a lamp remains bright throughout its life.

In some type of motorcar lamps it is conventional to intercept a part of the radiated light by means of metal screening caps which are arranged in the envelope. Such a method cannot readily be used in halogen incandescent lamps, since the screening caps are attacked by halogen unless they are manufactured from a noble metal.

It is the object of the invention to overcome this difficulty. According to the invention, a method of manufacturing a halogen incandescent lamp having a quartz envelope in which a part of the radiated light is screened, is characterized in that a black layer which does not pass visible light is provided on the part of the envelope destined for that purpose by coating said part with an ethyl silicate paint which contains silicon as a black pigment, removing the solvent and subjecting the layer on the envelope to a thermal treatment. The layers obtained by the method according to the invention are deep black and poorly reflecting.

The ethyl silicate paint used in the method according to the invention may be obtained, for example, as follows:

Powdered silicon (purity better than 98 percent) is ground to a grain size of maximally 50 microns by grinding in a ball mill. The silicon powder is then ground for 3 × 24 hours in a ball mill with an equal quantity by weight of anhydrous kaolin in methanol. The resulting silicon-kaolin mixture is evaporated to dryness and then dried at 140°C for 15 hours. 3 kgms of the silicon-kaolin mixture are dispersed in 5,800 mls of a hydrolized ethyl silicate solution to which 415 gms of boric acid, 480 mls of monobutyl glycol ether, and 250 mls of glycerol are added by grinding the mixture in a ball mill for 3 hours. The hydrolized ethyl silicate solution was obtained by mixing ethyl silicate with water and methanol in a ratio of 180: 34 : 123 parts by volume.

After providing a layer of this paint, which may be done by spraying, it is dried, and then subjected to a thermal treatment by heating the envelope with the layer in a hot air furnace or operating the lamp. Suitable temperatures lie between 250° and 500°C The ethyl silicate is converted at this temperature into silicon dioxide.

In order that the invention may be readily carried into effect, two examples thereof will now be described in greater detail , by way of example, with reference to the accompanying drawing, in which

FIG. 1 is a diagrammatic side elevation of a spotlight lamp.

FIG. 2 is a diagrammatic side elevation of a automobile headlight employing two filaments.

FIG. 1 shows a 6 volt-35 watt halogen incandescent lamp (gas filling 5 atm. Kr + 0.1 percent by vol. of Ch_2Br_2)., for mounting in a parabolic reflector. On the outside of the wall 1 of the envelope, a black layer 2 is provided according to the method of the invention, while using an ethyl silicate paint with silicons as a black pigment as described above. For that purpose the envelope 1 of the lamp was covered with adhesive tape at those places where no black layer was to be provided. The free part of the wall of the envelope was coated by spraying with the black ethyl silicate paint. After drying the layer of paint the adhesive tape was removed and the lamp heated at 400°C in a hot air furnace for 10 minutes. The layer remained deep black throughout the life of the lamp (at least 2,000 hours). The lamp was operated in air; the temperature of the wall of the envelope during operation increased to 500° to 600°C.

FIG. 2 shows a automobile headlight provided with two filaments 3 and 4, for a non-blinding, low beam and for a bright or passing beam, respectively . The lamp is mounted in a parabolic reflector in such manner, that the bright beam filament is in the focus thereof. In the manner as described for the lamp shown in FIG. 1, a black layer was provided at 5 and 6.

The lamp shown is a 12 volt 2 × 55 watt lamp having a life of at least 250 hours. The lamp contains 5 atm. krypton and 0.1 percent by vol. Ch_2Br_2. At the end of the life, the black layer was found to be still in good shape. The lamp was operated in air, temperature of the wall of the envelope between 500° and 600°C.

The method according to the invention provides the following advantages.

1. Providing the screening presents few structural difficulties. 2. A corrosion-resistant screening is obtained which readily adheres to quartz and is resistant to scratches. 3. A sharply marked screening can be obtained. 4. The screening layer is resistant to temperature (600° to 1,000°C).

What is claimed is:

1. In a halogen incandescent lamp including a quartz envelope housing at least one filament, the improvement in combination therewith comprising an opaque coating on a portion of the envelope for providing a screen to block some of the visible light radiated from each filament, said coating comprising a black mixture of silicon and silicon dioxide.

2. A lamp according to claim 4 wherein the coating includes kaolin.

3. A lamp according to claim 1 wherein the envelope has interior and exterior surfaces, and the coating is on the exterior surface.

4. A lamp according to claim 1 wherein the envelope is a closed tubular member with an upper end part adjacent the filament, and said coating surrounds said upper end part.

5. A lamp according to claim 4 wherein the lamp has a second filament within the envelope axially spaced from the first, and a second coating axially spaced from the first and forming a band around the envelope.

* * * * *

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,784,861 Dated January 8, 1974

Inventor(s) VICTOR ROSALLIE NOTELTEIRS, JAN GOORISSEN

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Claim 2, line 1, "4" should be -- 1 --

Signed and sealed this 5th day of November 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents