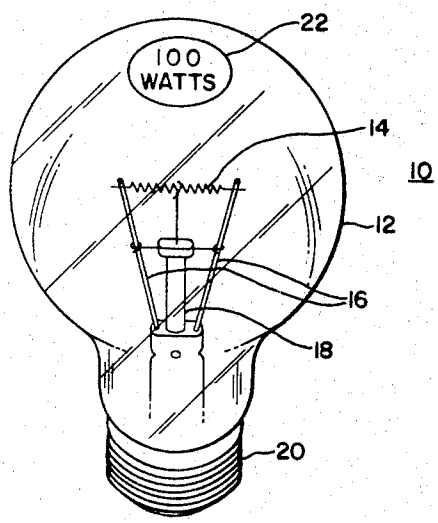
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LAMP MONOGRAM AND MONOGRAM INK

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WITNESSES

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LAMP MONOGRAM AND MONOGRAM INK

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ABSTRACT OF THE DISCLOSURE

Monogram for glass lamp envelope substantially comprises a thin layer of glass adhered to the envelope and having finely divided silver oxide embedded therein. The glass of the thin layer has a softening temperature less than about 450° C. and also less than that of the glass envelope. The ratio by weight of the glass in the monogram to silver oxide in the monogram is from 1:1 to 2.5:1.

This invention generally relates to lamps and, more particularly, to an improved monogram for the exterior surface of the lamp envelope and an ink for applying such a monogram.

It is the general practice to stamp a monogram or so-called etch on the exterior surface of a lamp bulb during the manufacture thereof, in order to identify the lamp type, or wattage, or manufacturer, or all three of these items. Particularly when the lamp is intended for exterior use, it is necessary that the applied monogram be resistant to weathering. Examples of such exterior lamp uses are street lighting and sign lighting.

It has been one practice of the art to utilize a monogram ink formed of about two parts by weight of silver oxide pigment and one part by weight of lead borate. These ink components were suspended in a vehicle such as glycerine and the ink stamped on the exterior surface of the lamp envelope during the manufacturing process. After application, the applied ink was heated to volatilize the glycerine and cause the lead borate to adhere the silver oxide to the envelope surface. The resulting monogram proved unstable when exposed to the elements, the varying proportions of the components of the ink impaired its stability before use.

It is the general object of the present invention to provide an improved ink for applying an abrasion-resistant, adherent and stable monogram to the exterior surface of a vitreous lamp envelope.

It is another object to provide an improved ink for applying a monogram to a vitreous lamp envelope, which monogram is very stable even when exposed to the elements.

It is a further object to provide an electric lamp wherein an improved monogram is adhered to the exterior surface of the lamp envelope, which monogram is very stable even when exposed to the elements.

The aforesaid objects of the invention, and other objects which will become apparent as the description proceeds, are achieved by providing a monogram ink which substantially comprises finely divided silver oxide and finely divided glass having a softening temperature less than 450° C. and also less than the softening temperature of the vitreous envelope to be monogrammed. The parts by weight of the glass relative to the silver oxide are from 1:1 to 2.5:1. The finely divided glass and silver oxide are suspended in a glycerine vehicle and the ratio of total cubic centimeters of glycerine in the ink to total grams of silver oxide in the ink is from 1:1.1 to 1:1.5. There is also provided the lamp which carries the improved monogram which substantially comprises the glass and silver oxide, wherein the ratio by weight of total glass in the monogram to silver oxide is from 1:1 to 2.5:1.

For a better understanding of the invention, reference should be had to the sole figure of the accompanying drawing which illustrates, in perspective view, an electric lamp which carries the improved monogram of the present invention.

With specific reference to the form of the invention illustrated in the drawings, the lamp **10** is of generally conventional construction and comprises a light-transmitting vitreous envelope **12** which encloses an energizable light source **14**, such as an incandescible filament. The filament **14** is supported in position by lead-in conductors **16** which are sealed through a conventional reentrant stem press **18** and electrically connect to the lamp base **20**.

The improved monogram **22** of the present invention is carried on the exterior surface of the envelope **12**, usually at the top portion thereof. It should be understood that the monogram could be used with either an incandescent lamp or a mercury or other type of lamp which is intended for exterior use and the monogram can be applied either to hard or soft glass.

The basic constituents which comprise the monogram are silver oxide and the glass, which glass has a softening temperature less than 450° C., as measured by the standard Littleton method. The glass is preferably used in greater amount than the silver oxide and this relatively large amount of glass protects the silver oxide pigment from any weathering. The parts by weight of glass to silver oxide can vary from 1:1 to 2.5:1 and the preferred composition uses two parts by weight of glass per one part by weight of silver oxide. This monogram, as applied, is a very thin layer of the low-softening temperature glass which has the silver oxide embedded therein. A representative thickness of the monogram is in the order of about one mil.

Glasses which have a softening temperature of 450° C. or less are described in the Journal of the American Ceramic Society, vol. 39, No. 3, pages 109–112 (March 1956). As a specific example, the glass portion of the monogram is formed of about 75% by weight lead oxide, 11% by weight aluminum oxide, 11% by weight boron oxide and 3% by weight silicon dioxide. Such a glass has a softening temperature of about 440° C. Any of the other glasses described in the foregoing journal article can also be used.

The monogram ink which is used to apply the foregoing monogram is formed of a mixture of the foregoing glass and silver oxide, within the foregoing weight ranges, along with glycerine in such amount that the ratio of total cubic centimeters of glycerine in the ink to total grams of silver oxide is from 1:1.1 to 1:1.5 and preferably about 1:1.2. The glycerine serves as a vehicle and viscosity-imparting agent for the ink. The primary ingredients which affect the viscosity of the ink are the relative proportions of glycerine and silver oxide.

As a specific example for preparing the present ink, 600 grams of finely divided silver oxide and 1200 grams of finely divided glass are mixed with 510 cc. of glycerine and 500 cc. of ethyl alcohol. The state of division of the glass and silver oxide is not critical, but preferably these materials should pass through a 200 mesh screen. The foregoing mixture is thoroughly mixed and then heated to a temperature of 70° C. for a prolonged period to completely evaporate the alcohol. The ink is then ready for use and only very slight stirring is required before it is placed into the ink reservoir of the automatic monogramming equipment, which equipment is well known in the lamp-making art.

The monogramming ink is applied to the envelope exterior surface prior to baking or lehring the lamp. Dur-

ing lamp lehring, the lamp is heated in the area of the ink to a temperature of 500° C., for example, which causes the finely divided glass in the ink to soften into the form of a thin layer having the silver oxide embedded therein, with the softened glass tightly adhering to the exterior surface of the vitreous envelope. Of course the envelope should have a higher softening temperature than the glass of the monogram ink, and this will normally be the case since a representative softening temperature for a soft glass lamp envelope is 696° C.

In actual tests, monograms of the present invention are still legible and show very little weathering even after three months exposure to the elements. The best monograms or etches of the prior art, in contrast, weathered badly after only about three weeks and were barely legible.

It will be recognized that the objects of the present invention have been achieved by providing an improved monogram ink for applying a monogram to the exterior surface of a vitreous lamp envelope. The resulting monogram is abrasion resistant, adherent and very stable even when exposed to the elements.

As a possible alternative embodiment, small amounts of other pigments can be used to supplement the silver oxide. As an example, in the foregoing preferred example, twenty grams of finely divided cobalt oxide can be added to the ink.

While a preferred embodiment of the invention has been illustrated and described in detail, it is to be particularly understood that the invention is not limited thereto or thereby.

What is claimed is:

1. An ink for applying an abrasion-resistant, adherent and stable monogram to the exterior surface of a vitreous lamp envelope, said ink substantially comprising the following components mixed together in the following relative proportions:

(a) finely divided silver oxide;

(b) finely divided glass having a softening temperature less than 450° C. and also less than the softening temperature of the vitreous envelope to be monogrammed, with the parts by weight of said glass relative to said silver oxide being from 1:1 to 2.5:1; and

(c) glycerine which serves as a vehicle and viscosity-imparting agent for said ink, with the ratio of total cubic centimeters of said glycerine to total grams of said silver oxide being from 1:1.1 to 1:1.5.

2. The ink as specified in claim **1**, wherein both said silver oxide and said glass are sufficiently fine to pass through a 200 mesh screen.

3. The ink as specified in claim **2**, wherein the weight ratio of said silver oxide to said glass is about 1:2, and the ratio of total cubic centimeter of said glycerine in said ink to total grams of said silver oxide in said ink is about 1:1.2.

4. The ink as specified in claim **2**, wherein said glass has the following approximate composition as expressed in terms of weight: 75% PbO, 11% Al_2O_3, 11% B_2O_3, and 3% SiO_2.

5. An electric lamp comprising, a light-transmitting vitreous envelope which encloses an energizable light source, a monogram adhered to the exterior surface of said envelope, said monogram substantially comprising a thin layer of glass adhered to said envelope and having silver oxide embedded therein, said glass of said thin layer having a softening temperature less than about 450° C. and less than that of said vitreous envelope, and the ratio by weight of the total glass in said monogram to silver oxide in said monogram being from 1:1 to 2.5:1.

6. The lamp as specified in claim **5**, wherein the ratio by weight of the total glass in said monogram to silver oxide in said monogram is about 2:1.

7. The lamp as specified in claim **6**, wherein said glass in said monogram has the following approximate composition as expressed in terms of weight: 75% PbO, 11% Al_2O_3, 11% B_2O_3, and 3% SiO_2.

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