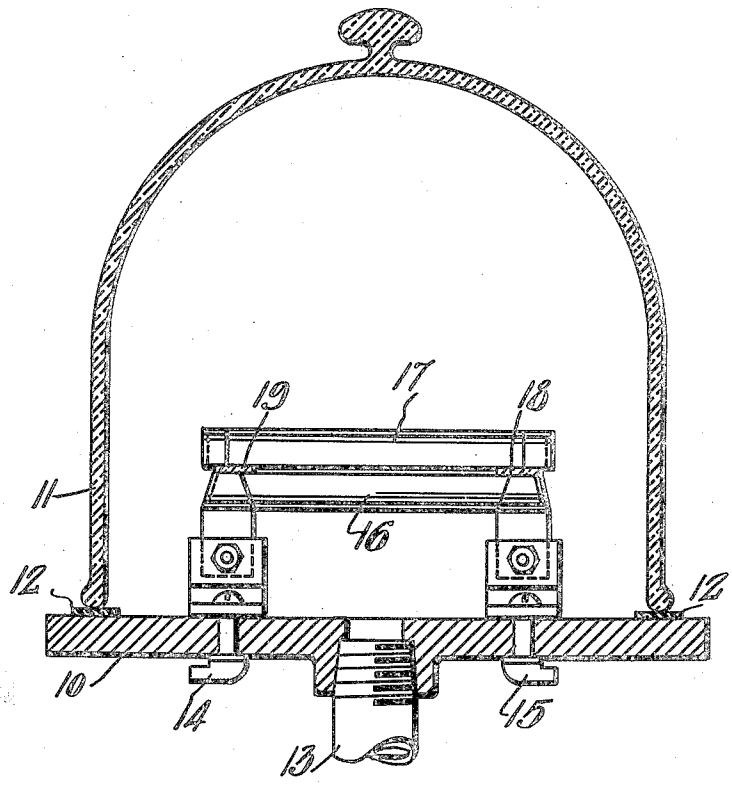
March 27, 1945. J. H. REYNOLDS 2,372,639

METHOD OF PRODUCING LENS COATING MATERIAL

Filed April 18, 1942



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Patented Mar. 27, 1945

2,372,639

UNITED STATES PATENT OFFICE

2,372,639

METHOD OF PRODUCING LENS COATING MATERIAL

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Application April 18, 1942, Serial No. 439,455

5 Claims. (Cl. 106—286)

This invention relates to an improved method of producing a material for providing reflection reducing coatings on lenses or other optical surfaces.

In an application of Glenn L. Dimmick, Serial No. 432,836, filed February 28, 1942, entitled "Reduction in reflection from glass" (RCV Docket 8689), there is disclosed an improved reflection reducing coating for lenses and analogous parts. The said coating is evaporated from a mixture of aluminum fluoride and calcium fluoride, which are in molecular proportions in the mixture. The Dimmick application also discloses the addition of aluminum oxide to the material for the purpose of securing proper characteristics of surface tension.

In the present invention I prepare a pure eutectic compound of the two fluorides by evaporation of a mixture of the constituents in a vacuum.

One object of the present invention is to provide an improved lens coating material.

Another object of the invention is to provide an improved method of making a lens coating material.

Another object of the invention is to provide an improved method of making a pure lens coating material.

Other and incidental objects of the invention will be apparent to those skilled in the art from a reading of the following specification and an inspection of the accompanying drawing, in which the single figure is a view, partly in section, of the apparatus used in the performance of the method.

Referring to the drawing, the evaporating apparatus is provided with the usual base 10 and bell jar 11, which is in turn provided with an appropriate airtight sealing means 12 for preventing leakage between the bell jar and the base. The base is provided with the usual exhaust pipe 13, through which the apparatus may be evacuated, and with terminal connections 14 and 15 for the supply of electric current. The connections 14 and 15 are so constructed that appropriate attachment can be made thereto within the bell jar.

On the connections 14 and 15 there is supported a boat 16, which may be folded from appropriate thin metal, the ends being folded down as shown to make connection with the terminals 14 and 15. The boat 16 is preferably made of platinum, although an appropriate iron-chromium alloy may be used if desired. It will be apparent that if sufficient current is supplied through the connections 14 and 15, the boat 16 may be heated to practically any temperature desired.

On the boat 16 there are placed small insulating pieces 18 and 19, which may be, for example, of mica or porcelain, to prevent the short-circuiting of a portion of the current through the boat 16 by the similar boat 17 which is placed over it in an inverted position.

The boat 17, as shown, is not provided with the extending current carrying portions which are provided on the boat 16, as they are not necessary for the purpose of the boat 17. However, these two boats may be made identical if desired, so that they may be interchanged according to the use to which they are to be put.

The mixture of calcium fluoride and aluminum fluoride in molecular proportions with an appropriate percentage of inert material, such as aluminum oxide, is placed in the boat 16 and the apparatus is then evacuated, the boat 16 being heated to a relatively low temperature to drive off gas during the evacuation. After an appropriate vacuum is secured, the current through the boat 16 is increased to cause volatilization of the material therein. The temperature of the boat 16 may be readily ascertained by an optical pyrometer directed thereupon, and once the boat is calibrated the approximate temperature can be determined by an appropriate ammeter in the supply circuit.

The evaporation is preferably performed at a temperature of approximately 1000° C. As the material is evaporated from the boat 16, it condenses on the inner surface of the boat 17, this process continuing until a considerable quantity of the material has been deposited on the inner surface of the latter boat.

After a sufficient quantity of the material has been distilled into the boat 17, the temperature is reduced, air is admitted, and the boat 17 removed, whereupon the material can be removed therefrom; or, if the boat 17 is equipped with appropriate terminals, the material may be reevaporated therefrom onto the articles to be coated. In re-evaporating, an appropirate percentage of a relatively inert material, such as aluminum oxide, should be added to the mixture, as described in the Dimmick application referred to above, in order to control the surface tension of the material and its adhesion.

The prepared material consisting of the evaporated product and the small percentage of aluminum oxide may be sprayed or otherwise coated onto an appropriate filament such, for example, as one made of tungsten, for evaporation onto optical surfaces; or, as pointed out above, after the material has been removed from the boat and

mixed with an appropriate percentatge of aluminum oxide, it may be replaced in the boat for evaporation.

Having now described my invention I claim:

1. A lens coating material consisting of the evaporation product of a mixture of equal molecular parts of calcium fluoride and aluminum fluoride.

2. The method of producing material for reducing the reflection of optical surfaces comprising the steps of mixing calcium fluoride and aluminum fluoride and distilling off equal molecular proportions thereof in vacuum.

3. The method of producing material for reducing the reflection of optical surfaces comprising the steps of mixing equal molecular proportions of calcium fluoride and aluminum fluoride, evaporating in vacuum and collecting the vapor on a relatively cool surface.

4. The method of producing material for reducing the reflection of optical surfaces comprising the steps of mixing calcium fluoride and aluminum fluoride, evaporating off equal molecular proportions thereof in vacuum and collecting the vapor on a relatively cool surface.

5. The method of producing material for reducing the reflection of optical surfaces, comprising the steps of mixing calcium fluoride and aluminum fluoride, evaporating off equal molecular proportions thereof in a vacuum, collecting the vapor on a relatively cool surface, and mixing the resultant product with aluminum oxide.

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