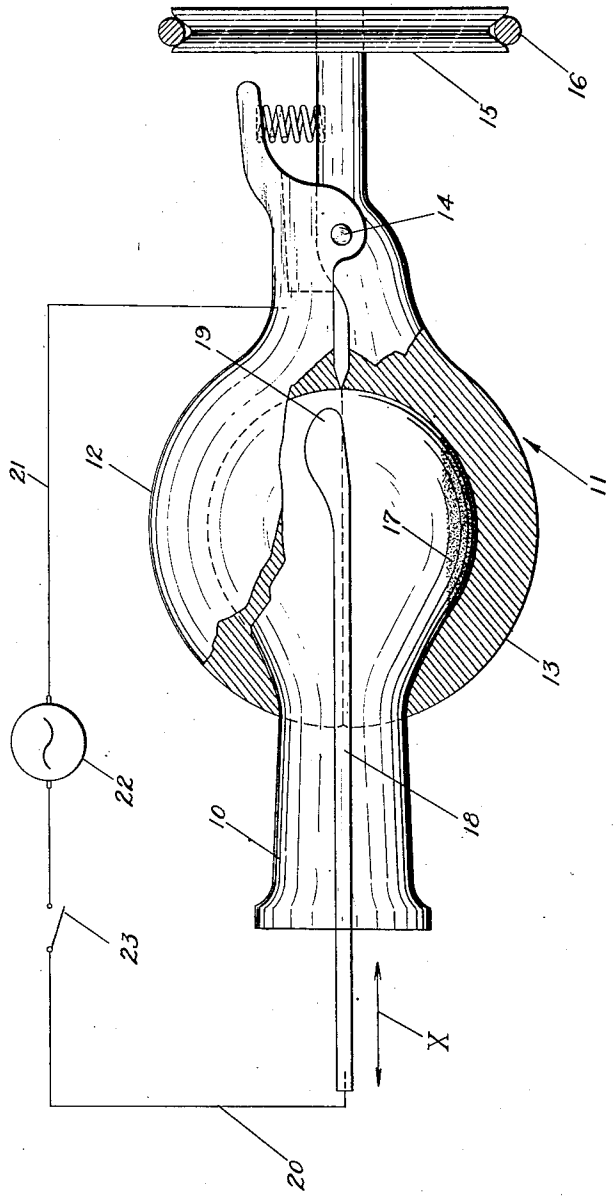
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METHOD OF DRY COATING LAMP BULBS

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METHOD OF DRY-COATING LAMP BULBS.

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This invention relates to the manufacture of hollow bodies such as incandescent electric lamp bulbs provided with a light diffusing layer upon the interior surface thereof.

In the manufacture of incandescent electric lamps, it is preferable to provide lamps for certain uses with a light diffusing layer either of a dull or frosted character, or one containing a color. It has been proposed to coat the inner surface of a bulb with a light diffusing layer by spraying finely divided material upon the bulb surface. It has also been proposed to first etch the inner surface of a bulb and then apply a coating by dusting the etched surface with a dry color material so that particles of the material adhere to the surface of the bulb to produce what may be termed a tinted bulb.

An example of such character of bulb may be found in connection with bulbs of novel shape such as in the shape of a flame, having the inside wall coated with what is termed a flame tint. Heretofore in producing the so-called flame tint bulbs it was necessary to apply the powder and agitate the same within the bulb until a sufficient quantity of powder had become deposited upon the wall.

The present invention aims to provide a more effective and positive method of applying powder to etched or smooth interior surfaces of bulbs. In practicing the present invention, a powder such as ultra-marine, kaolin or sienna is placed within the bulb and at the same time a high tension, high frequency discharge is passed through the bulb wall. The action of the discharge causes the particles of powder to be propelled or precipitated to the bulb wall to such an extent that the particles adhere to the wall and are not dislodged by general handling or impact, as during transportation.

The application of the finely divided pigment or other powder to the bulb may be accomplished by a desposit of such powder in the bulb or by propelling the powder in the form of a dry spray into the bulb and at the same time passing the high frequency discharge through the bulb. The action of the powder, that is, its apparent affinity for the glass or wall of the bulb may be due to an ionization of the powder which is thereby directed to the glass by reason of its charge. Whatever the reason may be for the adherence of the powder to the glass wall it has been found in practice that the particles stick to such extent as to provide a suitable light diffusing coating.

A coating applied by the present method is of a more uniform character and is more easily distributed upon the wall of the bulb than is possible by such methods as manually dusting the bulb with a powder, and, whereas, the dusted powder is only practical with etched surfaces, the present method makes it possible to coat unetched surfaces.

If it is desired to increase the light diffusing character of the bulb above that given to it by the powder, the bulb may be first etched or frosted by a suitable etching solution. Frosted bulbs are well known in the art and such bulbs may be employed in connection with the present method.

The invention will be more fully understood by reference to the accompanying drawing which shows a bulb held in position for the application of a coating.

A bulb 10 may be held in a holder 11 comprising jaws 12 and 13. These jaws may be of hemispherical form so that when positioned about the bulb they will provide an enclosing chamber. The jaws may be pivoted at 14 and a pulley 15 may be provided for a rotation of the holder through a belt 16 from any suitable source (not shown).

Within the bulb may be deposited a quantity of finely divided coating material 17 and an electrode 18 may be positioned within the bulb. An end 19 of the electrode 18 may be formed with a surface of generally the same contour as the interior surface of the bulb.

For the purpose of causing a discharge of electrical energy through the powdered material, the holder 11 may constitute an outer electrode and conductors 20 and 21 may be provided for supplying current from a suitable high frequency source 22 upon the actuation of a switch 23. The discharge between the electrodes being intercepted by the agitated or disturbed powder or finely divided

material, causes the same to become ionized and propelled against the interior surface of the bulb with the result that a layer of a coating material is deposited.

The material desposited gives a translucent light diffusing layer. This layer adheres to the bulb surface and inasmuch as it is on the inner surface of the bulb is protected against mechanical abrasion. The absence of a binder makes the coating particularly desirable for the inside of bulbs since the coating may be dry and free from moisture which in other coatings often gives off vapor detrimental to the life of the lamp.

The degree of density of coating desired may be controlled by the character of the pigment and by the length of time the bulb is rotated in the presence of a flow of electrical energy between the electrodes. After a sufficient deposit of material has adhered to the wall of the bulb, the remaining loose material may be removed and the bulb sealed to a mount in the usual manner to constitute an electric incandescent lamp.

From the above, it will be evident that when a quantity of finely divided coating material is deposited within the bulb the rotation of the bulb agitates the material, thus bringing the finely divided particles in the path of the discharge between the electrodes. It is, of course, obvious that if desirable the bulb may be held stationary and the electrodes may be rotated.

With the present method, it is possible to confine the coating to given portions of the bulb by providing an electrode 19 as shown which may be held in close proximity to said portions in a fixed position so that the discharge occurs betwen the surface 19 of the electrode and the shoulder 11, causing a coating to be deposited upon the bulb surface which passes between the two electrodes during a rotation of the bulb.

If it is desirable to coat the entire surface of the bulb, the electrode 18 may be reciprocated within the bulb in the direction of the arrow X so that during the rotation of the bulb the entire interior surface thereof will pass between the electrodes. It will be evident from that, that considerable variation in the formation of the coating is possible. Heretofore, difficulty has been experienced in coating given portions of a bulb as, for example, the top half of the bulb portion which as is desirable in certain types of lamps. When the lamp is sprayed or flushed, difficulty arises in confining the spray coating to the prescribed area, whereas, in the present method, any desirable area may be coated in an effective and efficient manner.

If desirable, the electrode 18 may be in the form of a tube and instead of depositing powdered material in the bulb such material may be discharged from an end of the electrode so that as the particles of powder issue, they will be positioned between the two electrodes and ionized for deposit on the bulb wall.

As above set forth, the present method is particularly advantageous in connection with the coating of an interior surface of a bulb but it is to be understood that the same method may be found desirable in coating the outside surface of a bulb or depositing a layer of material upon other bodies such, for example, as lamp shades, reflectors, or the like.

Although a preferred embodiment of the invention is shown and described herein, it is to be understood that modifications may be made therein without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. The method of coating the interior surface of a hollow body which comprises depositing within the body a coating material and in passing an electrical discharge through the coating material.

2. The method of coating the interior surface of a hollow body which comprises depositing within the body a finely divided coating material, agitating the material and passing therethrough an electrical discharge.

3. The method of coating the interior surface of a hollow body which comprises depositing within the body a finely divided coating material, rotating the body to agitate the material and passing therethrough an electrical discharge.

4. The method of coating the interior surface of a hollow body which comprises depositing within the body a finely divided coating material, and rotating the wall of the body between electrodes connected with a source of electrical energy.

5. The method of coating the interior surface of a hollow body which comprises depositing within the body a quantity of light diffusing material, positioning an electrode within the body and an electrode adjacent to the outside surface of the body and in passing an electrical discharge between said electrodes.

6. The method of coating the interior surface of a hollow body which comprises depositing within the body a quantity of a finely divided coating material, positioning an electrode within the body and an electrode adjacent to the outside surface of the body and in rotating the body during the passage of an electrical discharge between the electrodes.

7. The method of coating a portion of the interior surface of a hollow body which comprises depositing a quantity of a coating material within the body, positioning an electrode adjacent to a portion of the interior surface of the body and another electrode adjacent to a portion of the exterior surface of the body and in passing an electrical discharge between said electrodes.

8. The method of coating a portion of the interior surface of a hollow body which comprises depositing a quantity of a coating material within the body, positioning an electrode adacent to a portion of the interior surface of the body and another electrode adjacent to a portion of the exterior surface of the body, rotating the body and passing an electrical discharge between said electrodes.

In testimony whereof, I have hereunto subscribed my name this 8th day of December 1927.

DANIEL S. GUSTIN.