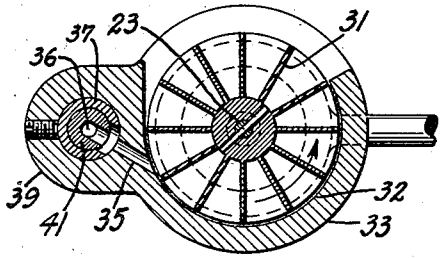
Feb. 5, 1935. D. S. GUSTIN 1,989,800

MOUNT GETTERING DEVICE

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Fig. 3.



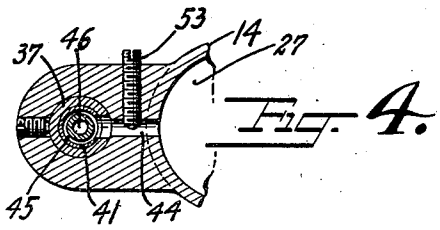
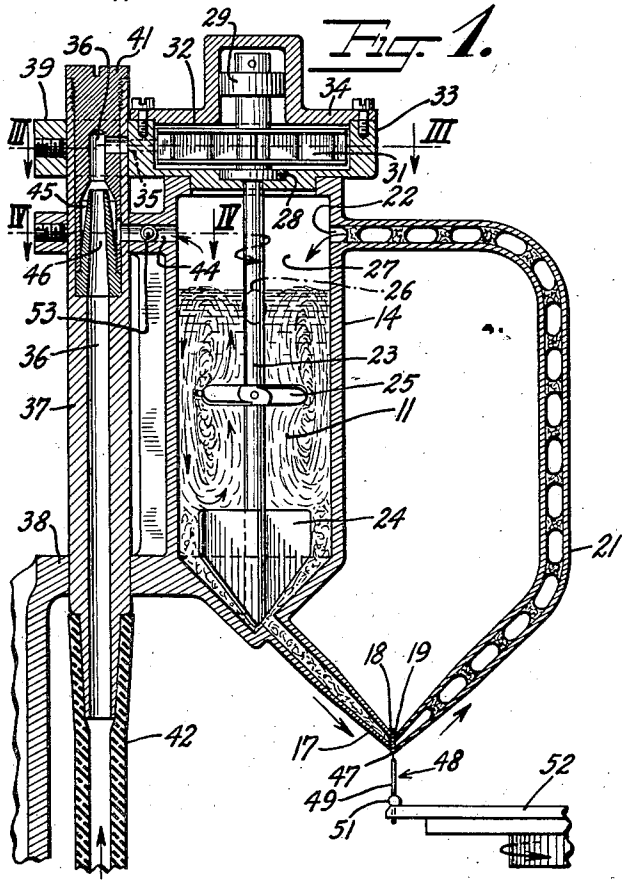


Fig. 4.

Fig. 1.



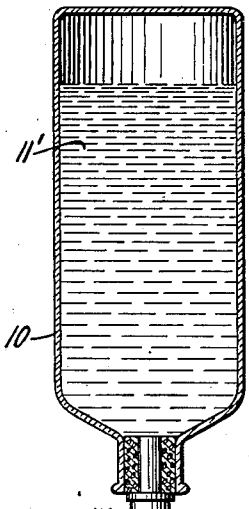


Fig. 5.

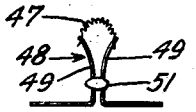
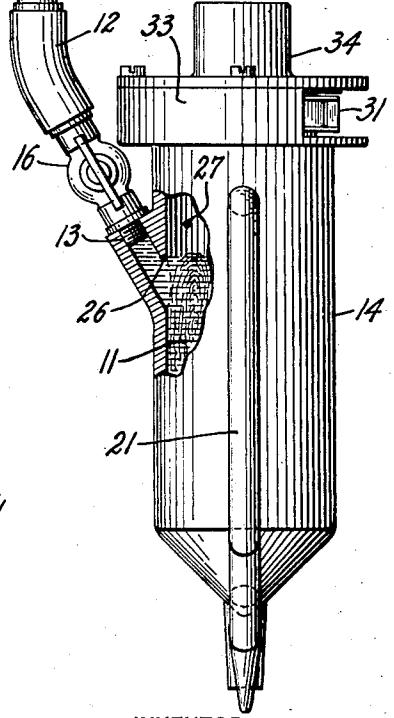


Fig. 2.



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Fig. 8.

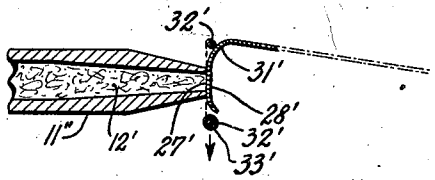


Fig. 9.

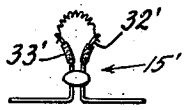


Fig. 6.

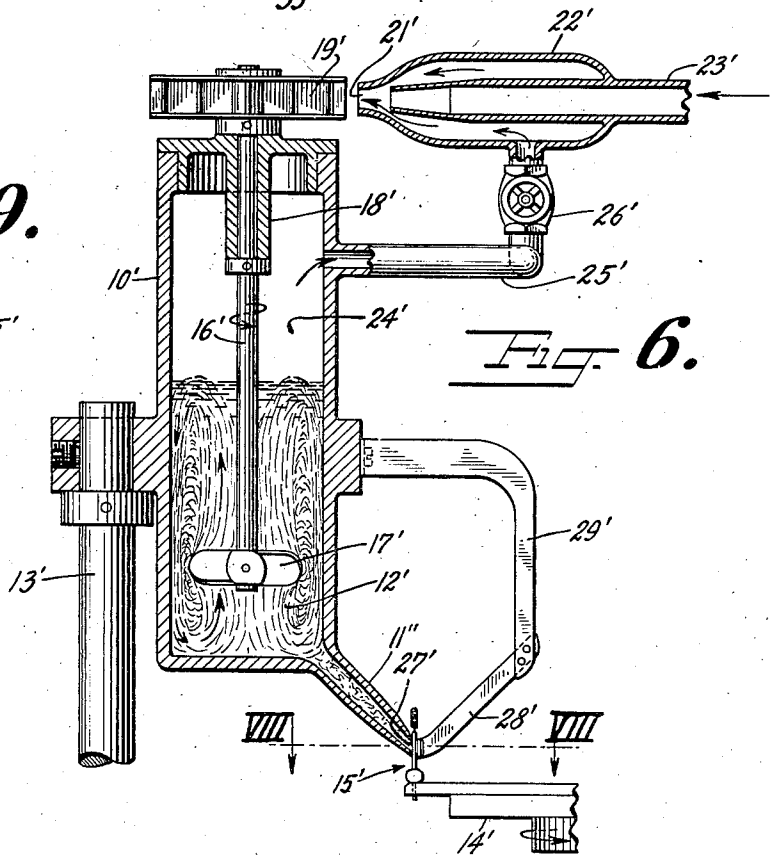
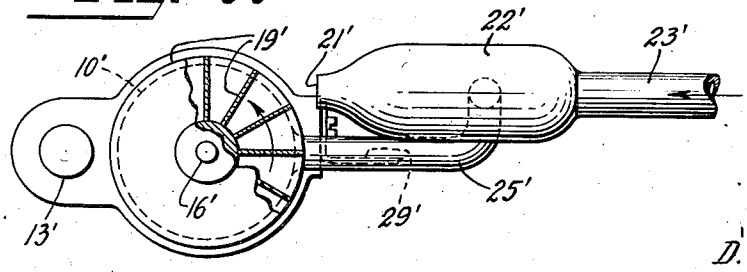


Fig. 7.



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UNITED STATES PATENT OFFICE

1,989,800

MOUNT GETTERING DEVICE

Daniel S. Gustin, Bloomfield, N. J., assignor to Westinghouse Lamp Company, a corporation of Pennsylvania

Application August 24, 1932, Serial No. 630,234

7 Claims. (Cl. 91—46)

This invention relates to an apparatus for applying a quantity of liquid or mobile material on an article and relates more particularly to an apparatus for applying a "getter" mixture on the filaments and/or lead wires of incandescent electric lamps.

In the manufacture of incandescent electric lamps, particularly lamps of the miniature type, the problem of applying a getter mixture to the filament and/or lead wires is presented. A miniature incandescent electric lamp includes what is termed a mount which consists of a pair of lead-in conductors or wires held together by a glass bead and having a coiled filamentary section connected to the ends of the leads.

It is the practice, in connection with lamp production, to apply the getter material to the filament and/or lead wires and this has been accomplished in various ways, as for example, by means of a wiper or brush or by dipping the filaments in a bath of getter. In the production of miniature lamps it is important to be able to apply the getter material at high speed, and heretofore the methods practiced for treating the filament tended to slow up production.

It is an object of the present invention, therefore, to provide an apparatus whereby a getter material may be applied to a filament and/or the lead wires in an effective manner and at a speed commensurate with the speed of manufacture of the other lamp parts.

Another object of the invention is to provide a method of gettering whereby a filament and/or the lead wires may be automatically treated while moving through a predetermined path.

Another object of the invention is to provide a stream of getter material so arranged that a filament and/or the lead wires may be passed therethrough and the getter applied in the absence of any mechanical applying instruments.

Another object of the invention is to provide an apparatus for gettering filaments and/or lead wires whereby a stream of getter is projected across an air gap and in the provision of means for removing excess getter material.

Other objects and advantages will be more fully understood from the following description together with the accompanying drawing in which

Figure 1 is a vertical cross-sectional view of an apparatus for gettering filaments constructed in accordance with the present invention;

Figure 2 is an end elevational view of the apparatus shown in Figure 1;

Figure 3 is a view taken on line III—III in Figure 1;

Figure 4 is a view taken on line IV—IV in Figure 1;

Figure 5 shows one type of lamp mount which may be provided with a getter by means of the present apparatus, shown in Figure 1:

Figure 6 is a vertical cross-sectional view of an apparatus for applying a material to lead wires constructed in accordance with the present invention;

Figure 7 is a top plane view of the apparatus, partly broken away, shown in Figure 6;

Figure 8 is an enlarged view taken on line VIII—VIII of Figure 6; and

Figure 9 is a view of one type of mount having a deposit of material on the lead wires thereof as applied by the present apparatus, shown in Figure 6.

As illustrated, the invention may comprise a supply reservoir 10 for holding a quantity of getter diluting or thinning liquid 11' which may be a volatile solvent. A getter supply reservoir or tank 10 may be suitably supported and connected by a pipe 12 with an inlet 13 of a feed tank 14 for getter material 11. The pipe or connection 12 is provided with suitable valves 15 and 16 to shut off the flow of thinning material to the tank 14 when the device is not in operation. The tank 14, is provided with an outlet nozzle 17, the orifice 18 of which is disposed in spaced relation to an orifice 19 at one end of a return pipe 21 which empties into the tank 14 at 22. Within the tank 14 is a centrally disposed spindle 23 having its lower end provided with a paddle or agitator element 24 to stir up the getter 11. Above the paddle and secured to the spindle 23 is a propeller 25 which serves to force the getter material upwardly so as to mix it thoroughly with the very slowly flowing thinner material 11' and to prevent it from running too freely through the nozzle 17.

The getter material is maintained at the level of the inlet opening 26 through means of the slowly flowing thinner 11' and the upper portion 27 of the tank 14 is kept under a partial vacuum by means to be presently described. The upper end of the spindle 23 is journaled in a bearing seat 28 and a guide bearing 29. For the purpose of rotating the spindle 23, the same is provided with a turbine wheel 31 mounted in a chamber 32 comprising a casing 33 having a cap or cover 34 secured to the casing.

The turbine or impeller wheel 31 is driven by an air jet projected from a passage 35 which passage is in communication with a passage 36 within a member 37 supported by a bracket 38

integral with the tank 14 and extension 39 integral with the casing 33.

The upper end of the passage 36 is closed by a plug 41 and the lower end is provided with a tubular connection 42 which in turn is connected with a supply of air under pressure, not shown. The flow of air under pressure through the passage 36 and out through the passage 35 results in an impact on the vanes of the turbine 31 causing it to rotate and consequently rotate the spindle 23 to operate the propeller 25 and the agitator 24. For the purpose of creating a partial vacuum in the upper portion of the tank, an outlet 44 is provided in communication with a chamber 45 in which an ejector 46 is provided so that as air is forced through the passage 36 the ejector action results in a removal of air from the upper portion 27 of the tank.

The getter material flows through the nozzle 17 and out the outlet orifice 18 and across the gap to the orifice 19 of the return pipe 21. The diameter of the orifice 18 is relatively small and air bubbles occur which travel up the pipe 21. These bubbles decrease the weight of the material or liquid in the pipe 21 and, by reason of the difference in pressure between the orifice and the interior portion 27 of the tank, a rush of air occurs which sucks away any excess getter flowing out of the orifice 18 and returns such getter to the tank 14.

Although various types of filaments or other articles may be treated or given a deposit of getter material with the present apparatus, it is found of particular advantage in applying a getter to the filament 47 of a mount 48. This mount comprises a pair of lead wires 49 held together by bead 51 and is of the usual construction employed in a miniature lamp such as an automobile headlight lamp or the like.

The mounts 48 are usually made on an automatic machine and are carried, in the process of their manufacture, through a predetermined path by means of a conveyor 52. The present machine may, therefore, be mounted in position so that as the mounts are made, they are moved with the conveyor and the filaments thereof passed through the gap between the orifices 18 and 19 at which time the deposit of getter material is applied to the filament, any excess material being carried up in the pipe 21 as above explained.

It will be evident that inasmuch as the portion 27 of the tank 14 is under a partial vacuum, that the tendency of the material 11 to flow through the orifice 18 is retarded by reason of the difference in pressure. For this purpose a valve 53 is provided so as to regulate the degree of vacuum to balance it with the potential energy of the material under the force of gravity so that the amount of material issuing from the orifice 18 may be regulated. The member 37 is so constructed as to also serve as a valve and, as shown in Figure 3, the plug 41 may constitute a valve stem so that when it is rotated, the passage 35 through which air is ejected, the turbine may be opened or closed and the outlet 44 may also be opened or closed by rotation of the stem 41. The valve 53 has been found in practice, however, to give sufficient control in regulating the vacuum in the tank.

Figures 6 to 9 show a modified form of the device which may comprise a tank 10' having an outlet nozzle 11'' for the discharge of a getter material 12'. This material is in fluid or semi-fluid state and is capable of flowing freely through the nozzle. The tank may be supported on a post 13' located so as to bring the nozzle 11'' in operative position to a conveyor 14' upon which the mounts 15' are carried. Centrally disposed within the tank is a spindle 16' having an agitator or propeller 17' at one end thereof. The spindle may be journaled in a bearing 18' and provided with a turbine wheel 19' disposed in position to be rotated by air under pressure discharged from the end 21' of an ejector 22'. The ejector 22' may be connected by a pipe 23' with any suitable source of air pressure supply, not shown.

The purpose of the ejector is to provide means for partially evacuating the upper portion 24' of the tank 10' and the ejector is, therefore, provided with a by-pass connection 25' leading into the said upper portion 24' of the tank. A valve 26' is provided to regulate the degree of vacuum desired. The material 12' moves by gravity through the nozzle 11'' and issues from orifice 27' thereof. The rate of flow of the material may be controlled by regulating the degree of vacuum in the upper portion 24' of the tank.

The material is normally prevented from flowing through the nozzle 11'' by a spring-tension member 28' carried on arm 29' suitably secured to the side of the tank. The spring 28' makes light tensional contact with the orifice 27' and is rounded at 31', as shown in Figure 8, as to be readily moved aside by a lead wire 32' of a mount as it is moved between the orifice 27' and the tension member 28'. After the passage of a mount across the orifice 27', a deposit 33' of getter material will adhere to the lead wires.

A simple and effective device is thus provided for automatically depositing a quantity of material on the lead wires of a mount and that by reason of the present construction, the same may be readily positioned to cooperate with the mount-making machinery and the material may be applied as the mounts are made without retarding other manufacturing operations.

It will be evident that by reason of the present invention a continuous supply of getter material is provided and lamp filaments may be moved in a continuous stream through the getter material so that the operation of applying the getter in no way delays other manufacturing operations. Furthermore, the apparatus, as shown in Figure 1 for example, makes it possible to perform the gettering operation without the use of any mechanical implement such as a brush or other tool which might change the relation of the filament to the lead wires of the mount. Furthermore, in the device shown in Figure 1 a stream of material is projected across a gap by reason of the nozzle and the return conduit which pulls the material across the gap. When a filament is passed through the stream the spaces between the coils of the filament are filled with material by reason of the suction action in the conduit or return pipe.

The amount of material used for each treatment is extremely small and the tank holds sufficient material for a long run of mounts. The thinner material keeps the volume of the material constant. The amount of getter used is very small for a day's run and it is preferable to fill the tank each day and owing to the small amount of material used the addition of the thinning does not appreciably change the density of the composition.

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. A device for applying a liquid material to an article comprising a tank for the material, said tank having an outlet nozzle below the level of the material, a return conduit having its inlet orifice in spaced relation to the outlet orifice of said nozzle and means for reducing the pressure above said liquid to cause said material to bridge said orifices.

2. A device for applying liquid material to an article comprising means for projecting a stream of material and a pipe having one end disposed in spaced relation to said first means and means for reducing the pressure in the other end of said pipe to cause the same to receive excess material when an article is passed through said stream to receive a deposit of said material.

3. A device for projecting a liquid material for deposit on an article comprising a nozzle, a conduit having its orifice spaced from the orifice of said nozzle a distance substantially equal to the thickness of the article to be treated to provide an exposed stream of liquid, means for projecting material from said nozzle and means for causing said material to travel through said conduit.

4. A device for depositing a quantity of a material on an article comprising a tank for a liquid material, said tank having an outlet for the material for deposit on an article, a pump for stirring said mixture, said pump operating to produce a vacuum in said tank above the level of said liquid.

5. A device for feeding a liquid for deposit on an article comprising a container partly filled with a liquid, a nozzle at the lower end of said container for the discharge of said liquid by gravity and an ejector for producing a vacuum in said container to control the flow of liquid from said nozzle.

6. A device for feeding a liquid for deposit on an article comprising a container partly filled with a liquid, a nozzle at the lower end of said container for the discharge of said liquid by gravity, means for producing a vacuum in said container to control the flow of liquid from said nozzle and a return conduit communicating with the evacuated portion of said container for the flow of material from said nozzle to said container.

7. A device for feeding a liquid for deposit on an article comprising a container partly filled with a liquid, a nozzle at the lower end of said container for the discharge of said liquid, rotary means within said tank for stirring said liquid, pneumatic means for actuating said rotary means, said pneumatic means operating to produce a vacuum in said container.

DANIEL S. GUSTIN.