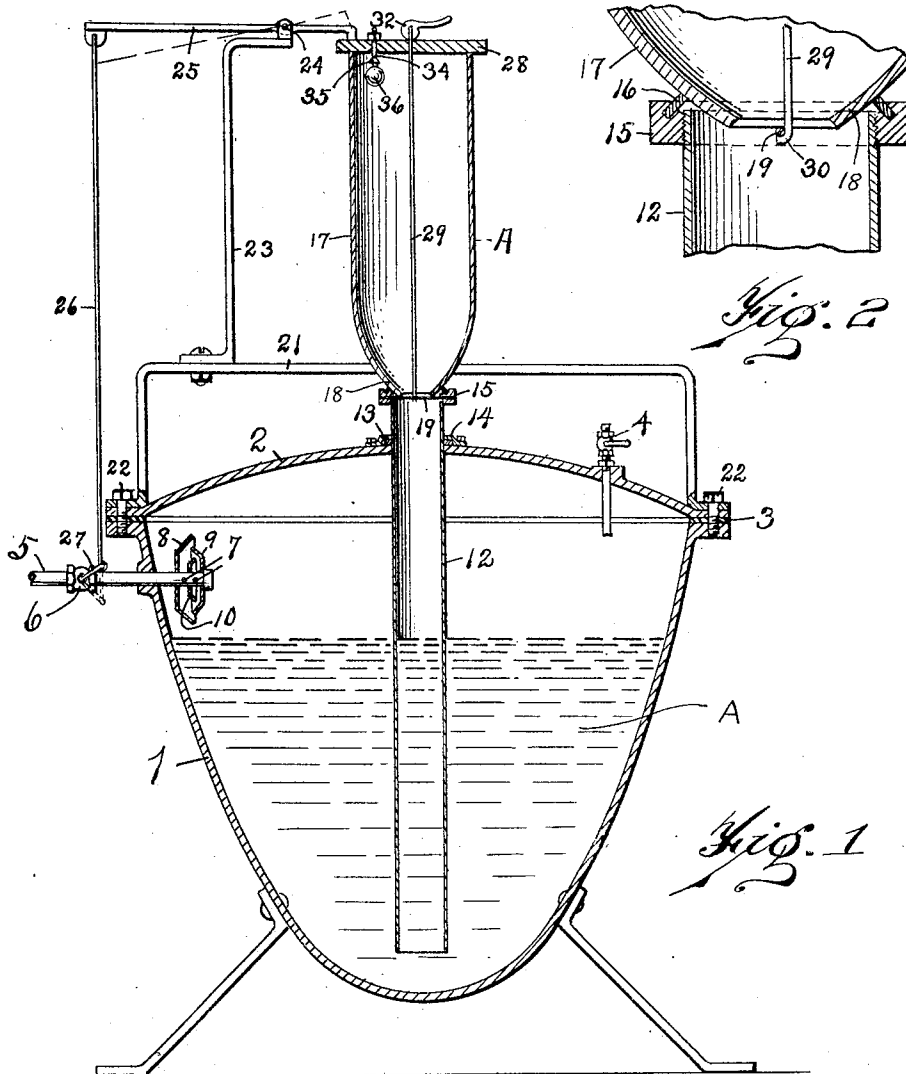


F. C. RUPPEL.
 DEVICE FOR COATING THE INTERIORS OF HOLLOW ARTICLES.
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1,404,547.

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DEVICE FOR COATING THE INTERIORS OF HOLLOW ARTICLES.

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Specification of Letters Patent. Patented Jan. 24, 1922.

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To all whom it may concern:

Be it known that I, FREDERICK C. RUPPEL, a citizen of the United States, and residing at Grand Rapids, in the county of Kent and State of Michigan, have invented a new and Improved Device for Coating the Interiors of Hollow Articles, of which the following is a specification.

This invention relates to means for coating the insides of hollow bodies with any desired liquids, and its object is to provide a device which will apply an excess of coating liquid to all parts of the inner surfaces of such hollow bodies and which will permit the draining of such bodies at any time subsequent to such application. A particular object of this invention is to provide means for coating such interior surfaces as are not readily accessible and also the interiors of bodies whose exteriors are to remain uncoated.

This invention consists in combination with a receptacle for the coating liquid to the top of which the hollow bodies whose interiors are to be coated may be attached, of means for locking such hollow bodies in position to prevent leakage, and of means to supply air pressure to the interior of the receptacle whereby the coating liquid may be forced up into the hollow body.

It further consists of means controlled by the liquid in the hollow body for stopping the flow of air to the receptacle for the coating liquid and thereby stop the flow of the coating liquid into the hollow body.

It also consists in the details of construction illustrated in the accompanying drawing and particularly pointed out in the claims.

In the drawing, Fig. 1 is a vertical section of this improved coating mechanism. Fig. 2 is a section on a larger scale showing the connection between the body to be coated and the upper end of the vertical tube through which the coating is conducted to the interior of the article to be coated.

Similar reference characters refer to like parts throughout the several views.

The receptacle 1 may be of any convenient shape and size and it is provided with a cover 2, a packing ring 3 serving to prevent leakage between them. A small air valve 4 permits the escape of air from this receptacle and a pipe 5 provided with a valve 6 conducts air under pressure to the recep-

table. This air pipe is preferably provided with discharge openings 7 and on the pipe are mounted the baffle plates 8, 9 and 10 which prevent the direct blasts of air on the coating liquid and thus avoid agitating it unnecessarily.

A carefully finished vertical tube 12 is slidably mounted in this cover 2, and a packing ring 13 with the retaining ring 14 may be employed to prevent leakage of air around this tube. The upper end of this tube is provided with a saddle 15 to receive the bodies A to be coated, a separate saddle being provided for each particular type of work to be treated. A packing ring or gasket 16 is mounted in a groove in the saddle and prevents leakage between the saddle and the work to be coated. The saddle is preferably screw-threaded onto the tube 12.

In the present case I have shown a projectile casing 17 which has its tapering end fitting the packing ring 16 mounted in the saddle 15. A rod 19 extends across the upper end of the tube 12 and into the saddle 15 at its ends. A frame 21 may be secured to the top 2 by some of the same bolts 22 which hold the top in position on the container, and on this frame is a bracket 23 which carries a pivot 24 for the lever 25. The outer end of this lever connects to a link 26 which extends down to the operating arm 27 of the air valve 6. A closure 28 is provided with a longitudinally movable locking rod 29 having a hook 30 on its lower end adapted to extend around the transverse rod 19, and a cam 32 at its upper end. The cam is swung to lower the rod 29 which extends down through the body 17 so that its lower end may engage the rod 19. When the cam is swung to the position shown in Fig. 1, it forces the closure 28 down onto the upper end of the body 17.

The lever 25 is then swung to the position shown in solid lines in Fig. 1, which permits the entrance of air under pressure to the receptacle 1 above the liquid A therein, forcing the liquid up the pipe 12 and into the receptacle 17. The air in the receptacle and in the tube 12 above the liquid therein is forced out through a small opening in the closure 28 wherein is mounted a rod 34 having a valve 35 and a float 36 at its lower end, and as the liquid reaches the float this is lifted until the valve 35 closes the small air passage. The distance between the float

36 and the valve 35 determines the final height of the coating within the work. Further admission of air to the receptacle 1 now causes the tube 12 and the body 17 thereon to be lifted, which causes the lever 25 to be swung to the position indicated in dotted lines in Fig. 1, and the valve 6 to be closed.

The coating liquid is permitted to remain in the work being coated as long as is deemed necessary. If the work is of a porous material which is to be saturated with the liquid in the container 1, it may be necessary to permit this liquid to remain in the work for an extended period of time. Where the work is of an impervious material, the valve 4 may be opened directly after the valve 6 is closed to permit the escape of air in the container 1 and permit the tube 12 and the work thereon to descend and the liquid within the tube 12 and within the work to flow back into the receptacle 1, after which the cam 32 is swung over to release the hook 30 from the rod 19 and the article which has been coated is lifted off and replaced by another.

It will be noticed that this coating mechanism is of especial value where it is desired to coat the interiors of hollow bodies which have very small openings and which are therefore difficult to coat with an ordinary brush, and it is also particularly advantageous for coating the interiors of bodies made up of porous material which absorb liquids freely, as this device permits an application of an excess of such liquids for any desired length of time. The small air valve in the closure 28 and the closure itself may be omitted in many cases, especially where it is not deemed necessary to apply a coating to the interior of the article up to the upper edge of it.

It is apparent that the article 17 being coated may itself be a receptacle to receive articles to be coated, in which case these articles become entirely covered by the liquid forced up into the receptacle 17 and which freely drain into the container 1 after proper coating.

The details and proportions of this coating mechanism may all be changed by those skilled in the art without departing from the spirit of my invention as set forth in the following claims.

I claim:—

1. In a machine for coating the interiors of hollow articles, the combination of a receptacle for the coating liquid and a top therefor, a pipe extending through the top toward the bottom of the liquid in the receptacle, a saddle at the upper end of said pipe, means to secure the article to be coated to the saddle, and means to convey air under pressure to said receptacle.

2. In a machine for coating the interiors of hollow articles, the combination of a receptacle for the coating liquid and a top therefor, a pipe extending through the top toward the bottom of the liquid in the receptacle, a saddle at the upper end of said pipe, means to secure the article to be coated to the saddle, means to convey air under pressure to said receptacle, comprising a pipe extending into said receptacle, a valve in said pipe to control the flow of air through the same, and means within the receptacle mounted on the pipe to prevent the agitation of the liquid within the receptacle by the incoming air.

3. In combination, a receptacle for a coating liquid, means to introduce air under pressure, a valve to permit the escape thereof, a saddle to support articles to be coated, and a tube extending down from the saddle to below the surface of the coating liquid.

4. In a machine for coating the interiors of hollow articles, the combination of a receptacle for the coating liquid and a top therefor, a saddle for the articles to be coated and a pipe extending therefrom into the receptacle to below the level of the liquid therein, means to introduce air under pressure into said receptacle, a cross bar in said saddle, and means extending up from the cross bar to the top of the article to secure the article to be coated to said saddle.

5. In a machine for coating the interiors of hollow articles, the combination of a receptacle for the coating liquid and a top therefor, a tube slidable vertically in said top and means to prevent the escape of air around the tube, means to secure the articles to be coated to the upper end of the tube, a pipe to introduce air under pressure into the receptacle, to force the liquid in the receptacle up the tube into the article to be coated, a valve to control the admission of air, and means in the path of the article being coated when moved upward by the liquid therein to close said valve.

6. In a machine for coating the interiors of hollow articles, the combination of a receptacle for the coating liquid and a top therefor, a tube slidable vertically in said top and means to prevent the escape of air around the tube, means to secure the article to be coated to the upper end of the tube embodying a cover for such article and a rod extending down within said article to the upper end of the tube, means to prevent leakage between the tube and said article, and an air valve mounted in said cover embodying a valve and a float whereby the coating liquid when it reaches a predetermined height within the article seats the valve and prevents further escape of the air therein.

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