

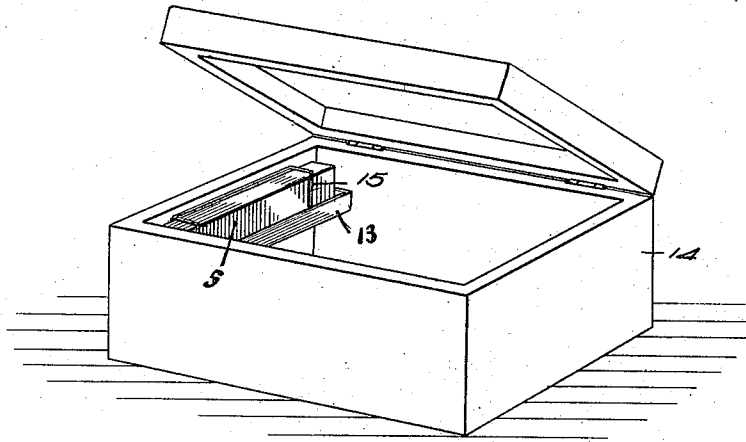
R. S. CURTISS.  
HUMIDOR.

APPLICATION FILED JULY 14, 1915.

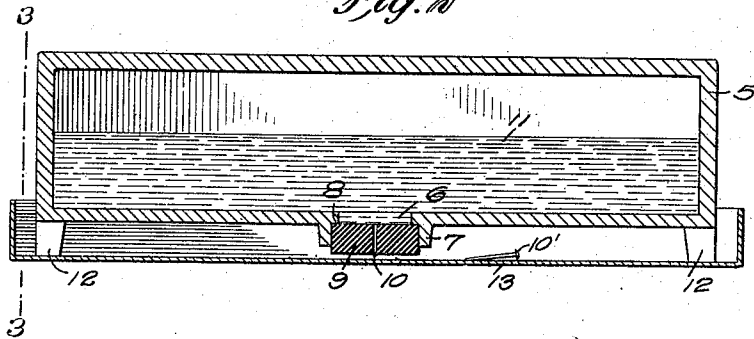
1,237,176.

Patented Aug. 14, 1917.

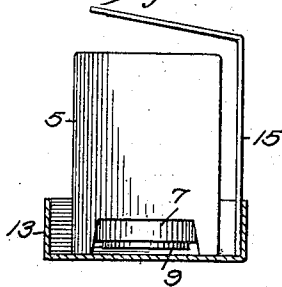
*Fig. 1*



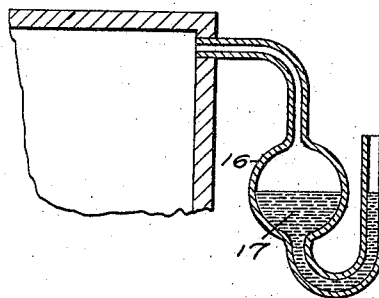
*Fig. 2*



*Fig. 3*



*Fig. 4*



WITNESSES

*F. D. Sweet*  
*B. J. Hoff*

INVENTOR

*Richard S. Curtiss*

BY *Munn Co.*  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

RICHARD S. CURTISS, OF PASADENA, CALIFORNIA.

## HUMIDOR.

1,237,176.

Specification of Letters Patent. Patented Aug. 14, 1917.

Application filed July 14, 1915. Serial No. 39,838.

*To all whom it may concern:*

Be it known that I, RICHARD S. CURTISS, a citizen of the United States, and a resident of Pasadena, in the county of Los Angeles and State of California, have invented a new and Improved Humidor, of which the following is a full, clear, and exact description.

My invention relates to humidors, and has for its object to provide a simple, inexpensive, and efficient apparatus which will automatically maintain in an inclosed body of air a constant and definite amount of moisture, depending on the vapor tension of the liquid used in the apparatus.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination and arrangement of parts as herein fully described, illustrated and claimed. In the accompanying drawings, forming part of the application, similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of a box, which may be of any suitable shape and size, and which is provided with an embodiment of my invention;

Fig. 2 is a longitudinal section through a preferred embodiment of my invention;

Fig. 3 is a section on line 3—3, Fig. 2; and

Fig. 4 is a sectional view showing a modified air inlet of the container.

Referring to the drawings, 5 represents a porous container or receptacle having at the bottom thereof an opening 6 which is preferably surrounded exteriorly by a collar or neck 7 the inner diameter of which is larger than the opening 6, whereby an annular shoulder 8 is formed within the neck at the bottom of the container. Fitting into the neck is a plug 9 closing the opening.

Through this opening 6 the porous container 5 may be filled with a saturated aqueous salt solution, which solution will have a predetermined vapor tension depending on the character of the substance for which the apparatus is designed. It is a well known fact that saturated solutions will exert a definite vapor pressure at a definite temperature, and this pressure varies with the substance in solution. Therefore I can get a different but definite amount of vapor by filling my porous container with the desired saturated solutions.

The plug 9 has a bore 10 of capillary dimension through which air enters into the container when the liquid evaporates at the surface of the container. To facilitate the access of air to the bore 10, the same is prevented from contacting with the supporting means for the container by providing the container 5 with legs 12 which engage the bottom of the supporting tray 13. The porosity of the container is such as to allow a slow passage of the solution 11 to the outer surface of the container, where it forms a surface film, keeping the capillary pores closed, thus preventing air entering into the container above the surface of the liquid therein except through the capillary bore 10, the size of which bore depends on the porosity of the container. A pin 10' is used for sealing the bore when the same is to be rendered inoperative or when transporting the container.

The tray 13 is secured in a casing 14, the form and size of which depends on the size of the goods for which the apparatus is designed. It may be secured at any suitable place within the container. The container 5, when filled to any amount with a liquid having a predetermined vapor tension, is placed on to the tray within the casing, the liquid used having a predetermined vapor tension, depending on the articles for which the apparatus is to be utilized. To prevent the contact of the articles within the casing with the porous container 5, a guard 15 of any suitable form is provided about the container and secured to the tray.

As soon as the solution evaporates from the surface of the porous container 5, a slow but constant flow of air will take place through the bore 10 into the container, tending to equalize the air pressure within the container with the air pressure within the casing 14. When the air within the casing 14 is saturated as far as possible, that is to say, when no more moisture evaporates from the container, the air inlet within the bore 10 is automatically closed by the liquid within the container, and the liquid is prevented from running through the bore 10 by the capillary attraction of the solution in the small bore. If by some cause, the moisture of the air within the casing 14 is reduced below the constant depending on the liquid within the porous container, evaporation from the surface of the container 5 will take place; and as the liquid flows through the

walls to the outer surface of the container, a partial vacuum is created therein. The capillary attraction at the air inlet, that is, in bore 10 will be overcome and air from the outside of the container will bubble through the liquid above the surface to restore equilibrium within the container. This flow of liquid to the surface of the container, and flow of air into the container, will continue until the liquid within the container is evaporated and the dissolved salt is deposited in solid form on the surface of the container.

The tray 13 serves to gather any crystals which may drop from the container. It further serves the purpose of maintaining a partially inclosed space saturated with moisture around the plug 9, thereby preventing for the most part the evaporation of solution around the neck with the consequent deposit of crystals on the stopper, which might clog the air inlet and interfere with the operation of the apparatus.

In Fig. 4 a modified air inlet is shown, which consists of a liquid trap 16 sealed, not by the capillary attraction of the solution used within the container but by providing a sealing liquid 17, which liquid is preferably mercury, displaceable inwardly by the outside air pressure when a partial vacuum is created in the container and whereby air is admitted into the container. As shown, the trap is positioned adjacent the top of the container. It does not make any difference whether the air inlet is at the bottom, as shown in Figs. 1 to 3 inclusive, or at the top as shown in Fig. 4.

The main object of my invention is to provide a humidor comprising a closed container having porous walls, and adapted to contain a saturated aqueous solution of salt or crystalloid. The percolation of the solution through the walls of the container takes place rapidly at first, thus initially supplying a relatively large amount of moisture of the air inclosed in the box 14. The rate of evaporation is controlled by the salt in the solution and depends upon the kind of salt employed. As well known, the vapor tension of a saturated salt solution is determined by the kind of salt in the solution. As the water evaporates on the outside walls of the container 5, a layer of salt is formed which retards still further the evaporation of the water by increasing the thickness of the porous walls of the container through which the solution percolates. This retardation of the evaporation is the main object of using a salt solution, for after the initially large supply of moisture of the air in the box 14, a relatively small amount of moisture only is required to maintain the desired humidity therein.

The percolation of the solution through the porous walls of the container 5, forms

a partial vacuum therein which would, after a comparatively short time, nearly stop any further percolation and evaporation, for the reason that the outer layer of salt would be very dense and almost impervious to moisture so as to destroy the capillarity thereof. Such a stoppage of the evaporation must be avoided and therefore I have provided means for automatically admitting air into the interior of the container 5 as the air pressure therein decreases in order to equalize the air pressure within and without the container. By maintaining a nearly constant air pressure within the container, the formation of a hard, almost impervious scale or crust of salt is prevented and the solution will completely percolate through the walls of the container. The crust of salt may now be scraped off from the outside of the container and reintroduced within the same and water added thereto to repeat the cycle of operation, or, preferably, the crust of salt may be left on the outside and water alone may be introduced into the container which, percolating through the walls thereof, will gradually dissolve the salt by a process of osmosis carrying the salt back into the container 5, which is now again ready to start on its original cycle of operation.

By the use of desired liquid consisting of a saturated solution a constant and predetermined moisture content is maintained within an inclosed body of air. It must be noted that the saturated solution in the inclosed air will not only raise the moisture content of the articles inclosed in the casing where my apparatus is provided to a definite amount, but it will also abstract moisture if there is any excess present in the articles placed within the casing. The abstraction of moisture from the air surrounding the container is due to the presence of solids or crystals deposited on the surface of the porous container.

While I have described the principle of operation, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative and that such changes may be made as are within the scope of the appended claims.

I claim:

1. The combination of a closed container having porous walls and adapted to contain a saturated aqueous salt solution, and of means for maintaining an approximately constant air pressure within said container, as a partial vacuum is formed by reason of the percolation and evaporation of said salt solution, whereby the evaporation of said salt solution is gradually retarded until complete evaporation has taken place.

2. The combination of a closed container having porous walls and adapted to contain

a saturated aqueous salt solution, and of means for maintaining an approximately constant air pressure within said container, as a partial vacuum is formed by reason of  
5 the percolation and evaporation of said salt solution, whereby the evaporation of said solution is gradually retarded until complete evaporation has taken place, and a tray below said container in spaced relation there-  
10 to, said tray being adapted to collect salt

crystals dropping from the walls of said container.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RICHARD S. CURTISS.

Witnesses:

J. C. MURRAY,

C. HUDSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."