

Patented May 7, 1929.

1,711,739

UNITED STATES PATENT OFFICE.

PAUL A. MARSAL, OF LAKEWOOD, OHIO, ASSIGNOR TO NATIONAL CARBON COMPANY, INC., A CORPORATION OF NEW YORK.

NITROCELLULOSE LACQUER FOR SEALING TOPS OF DRY CELLS.

No Drawing.

Application filed November 21, 1927. Serial No. 234,907.

This invention relates to dry battery cells and has particular reference to means for sealing such cells against the escape of moisture, while at the same time providing means for dissipating interior gas pressure.

It is generally known that one of the causes of the deterioration of dry cells prior to being put into service is the escape of moisture through the crevices between the seal and the electrodes. In this manner the quantity of electrolyte solution is gradually diminished and the mix bobbin or the bibulous lining shrinks, thus materially increasing the internal resistance of the cell and eventually rendering it inoperative. It is probable also that air enters the cell through these same openings and increases zinc corrosion by depolarizing the centers of local action.

As a remedy for this trouble hermetic sealing of dry cells has been suggested and tried, but with such a seal the internal pressure may become sufficient to distort or rupture some portion of the cell unless elaborate means are provided for absorbing the gases evolved.

In accordance with my invention any customary cell assembling procedure may be followed. When the assembled electrodes and depolarizing mix are ready for sealing, a thin coating of nitro-cellulose lacquer is applied directly over the top of the mix body. If the cell is of a type in which a paste coating or other lining material extends over the top of the depolarizing mix, then said lining or coating is completely covered with the lacquer. An additional seal composed of any of the common sealing compounds such as rosin, sealing wax, pitch, or the like may then be applied if desired.

A number of nitro-cellulose lacquers containing a variety of solvents are obtainable at the present time. I do not wish to limit the invention to the use of any particular grade or type of such lacquer, since I have found that any of the so-called nitro-cellulose lacquers having the property of drying very rapidly and leaving a tenacious film of membranous character, may be used for the purpose of this invention. A solution of pyroxylin in a highly volatile solvent such as an ether-alcohol mixture, or a solution of an ether soluble cellulose derivative such as cellulose acetate or cellulose ethers in a suitable solvent, may also be used to form a satisfactory coating over the cell assembly.

I prefer to apply the lacquer by pouring, but depending somewhat on the nature of the cellulose solution being used, it may also be applied by brushing, spraying, or other suitable means. The thickness of the applied coating will vary somewhat depending on the covering properties of the lacquer, but in all cases should be sufficiently thin to permit easy perforation by interior gas pressure and thus permit escape of the gases.

The use of such a coating of lacquer or cellulose derivatives will effectively prevent the cell from drying out, and thus improve its shelf-life and delayed service capacity. At the same time since the coating is easily perforated means are provided for escape of gases generated in the interior of the cell and also for expansion of paste which may take place when the cell is in service.

I claim:

1. A method of sealing a dry cell which consists in completely covering the top of the mix body with a thin film of a cellulose-derivative lacquer.

2. A method of sealing a dry cell which consists in completely covering the top of the mix body with a thin film of a cellulose derivative lacquer, and adding an additional sealing compound.

3. A method of sealing a dry cell which consists in applying a thin coating of a solution of a cellulose derivative in a highly volatile solvent over the top of the mix body and its covering of lining material, allowing said solution to dry, and adding an additional sealing compound.

4. A method of sealing a dry cell which consists in completely covering the top of the mix body with a thin film of a nitro-cellulose lacquer.

5. A method of sealing a dry cell which consists in completely covering the top of the mix body with a thin film of a nitro-cellulose lacquer, and adding an additional sealing compound.

6. A method of sealing a dry cell which consists in applying a thin coating of nitro-cellulose lacquer over the top of the mix body and its covering of lining material, allowing the lacquer to dry, and adding an additional sealing compound.

In testimony whereof, I affix my signature.

PAUL A. MARSAL