

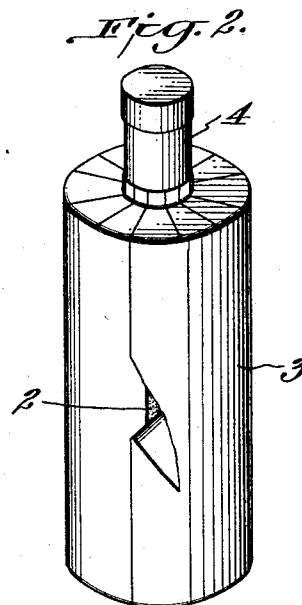
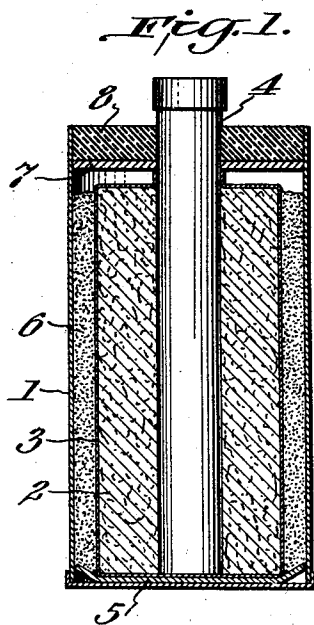
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DRY CELL AND METHOD OF MAKING THE SAME

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UNITED STATES PATENT OFFICE

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DRY CELL AND METHOD OF MAKING THE SAME

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In order to prevent the cathode or bobbin electrode from disintegrating, particularly during the assembly of the several parts of the dry cell, it has been customary, in manufacturing dry cells of the so-called "bag" type, to provide a bobbin with a wrapping of bibulous material such as fabric or paper, the wrapping being held in place about the bobbin by thread or the like. This method of wrapping the bobbin has either required a great deal of tedious hand labor or the provision of more or less complicated and expensive machines for accomplishing the same result, and moreover where paper is used the wrapped bobbin has not been uniformly efficient in operation due to the fact that air bubbles have remained between the bibulous envelope and the bobbin or between the envelope and the gelatinized paste commonly used in dry cells of this type.

In order to eliminate air bubbles within or adjacent to the wrapping it has been proposed to use paper maintained in close-fitting relation to the bobbin by means of cereal paste, either applied to the paper before wrapping it about the bobbin or else applied to the bobbin and then wrapping the paper tightly about the same.

The applicant has found that the paper may be applied to the bobbin so as to eliminate air bubbles without the use of cereal paste and at the same time the wrapper may be utilized to maintain a higher concentration of zinc chloride in the cell than heretofore obtained. This higher concentration of zinc chloride materially increases the efficiency of the cells in certain types of service, but it is difficult to secure such concentration in factory practice.

Accordingly it is an object of the present invention to eliminate air bubbles within or adjacent to the bibulous envelope and at the same time to do away with some of the difficulties incident to the use of a wrapping of thread about the bibulous material. A further object is to eliminate the step of applying cereal paste either to the bobbin or to the wrapper.

It is a further object of the invention to improve the service and shelf characteristics

of the cell by the use of a higher concentration of zinc chloride in effective relation with the mix and to avoid the difficulties in its introduction which have been heretofore encountered.

Other objects and advantages of the present invention will be made clear by the following detailed description, which is to be read in conjunction with the accompanying drawing, wherein Fig. 1 is a sectional elevation of a complete dry cell and Fig. 2 is a perspective view of a dry cell cathode constructed in accordance with the present invention.

In accordance with the method of the present invention, the paper envelope or wrapper for the bobbin is wet with a solution of zinc chloride or of zinc chloride and ammonium chloride and then, while in the wet state, is wrapped about the bobbin. Due to the partial gelatinization of the cellulose of the paper, the wrapper, when wrapped about the bobbin and squeezed firmly against the same to eliminate any air pockets, will adhere closely to the same. The adhesive reaction product of the zinc chloride and cellulose also cements the seam of the wrapper or envelope. The envelope is self-sustaining and does not become detached on standing, but on the contrary greatly increases the mechanical strength of the bobbin, decreases danger of internal short circuits and materially increases the service efficiency of the cell.

Thin and porous tissue papers of good quality have been found to be most suitable for wrapping bobbins. While the concentration of zinc chloride solution may be varied through a wide range, it is preferred to use concentrations substantially higher than those employed in the ordinary electrolyte solution. The following results have been obtained with solutions of different concentrations:

	Service (%)
A.—Unwrapped bobbin (control)-----	100
B.—Wrapped; paper wet with solution containing 100 parts of water to 40 parts of $ZnCl_2$ -----	110
C.—Wrapped; paper wet with solution containing 100 parts of water to 80 parts of $ZnCl_2$ -----	120

Fig. 1 illustrates an assembled cell, wherein 1 indicates the zinc cup or anode containing a cathode 2 comprising the carbon rod 4 and molded mass of depolarizing mix surrounding the same. The cathode is provided with a closely adherent wrapping 3 of paper impregnated with zinc chloride solution and is centrally positioned within the zinc cup by means of a serrated disk 5 of cardboard. The space between the bobbin 2 and the zinc cup is filled with a gelatinized paste electrolyte 6. On top of the bobbin and paste is located a washer or disk 7 which serves to center the bobbin and to support a layer 8 of sealing wax or pitch.

I claim:

1. A dry cell cathode having a self-sustaining envelope impregnated with zinc chloride and cemented to the cathode with the reaction product of zinc chloride on the envelope.

2. In the manufacture of a dry cell of the bag type, the steps of treating a sheet of cellulosic material with zinc chloride to gelatinize the former, and cementing the sheet to the surface of the cathode by the adhesive action of the gelatinized cellulose.

In testimony whereof, I affix my signature.
GEORGE W. HEISE.

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