

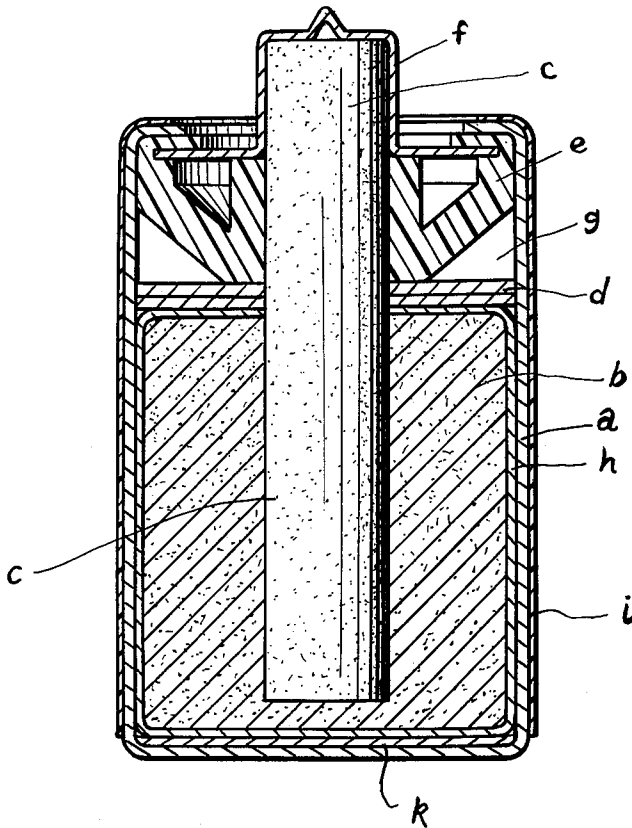
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DRY CELL

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DRY CELL

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The invention relates to a dry cell composed of a cup-shaped solution electrode, a depolarizing substance carrier (puppe), separated therefrom by a diaphragm impregnated with electrolyte, and a distance ring made of a synthetic plastic whose upper edge simultaneously serves as a sealer and as an insulator for the metal closing cap.

More particularly, the invention relates to an improvement of the distance ring, especially in paper-lined dry cells, wherein said distance ring fulfilling several functions denotes a marked improvement over the state of the art.

Paper-lined dry cells hitherto known come in one of two embodiments. After introduction of the depolarizing substance carrier in the zinc cup, the latter is sealed by means of a plastic closure or by a plastic or bituminous cast, at times together with a metal cap. According to one embodiment, this sealer is disposed directly on top of the depolarizing mass carrier, and according to the other embodiment, an unfilled void remains between the upper edge of the carrier and the sealer.

The disadvantages of the first embodiment are obvious as during the discharge of the cell reaction products form ensuing in an enlargement of the volume within the cell creating a considerable amount of pressure. Hence, leaks and undesirable leakage of electrolyte occur.

With the second embodiment, attempts have been made to overcome these advantages by leaving a free space between the upper carrier edge and the sealer. It has been found, however, that during discharge and also through external influences (e.g., vibration and shock) an expansion of the carrier into the free space occurs. This leads to an uneven electrical load of the cell based especially on unequal internal resistances.

It is the object of the present invention to do away with the shortcomings of both these embodiments. This is attained by placing between the polarizing substance carrier and the metal sealing cap of the cell a plastic cone as a distance ring which has a concentric drill hole and therefore is hollowed out. The cone's peak is flattened and is disposed on top of the carrier. It is opportune to place therebetween a disc of paper board or plastic. The wide upper part of the cone lies closely on the wall of the zinc cup and carries, in an upper recess, the metal closing cap. Upon ensuing flanging of the cell, the recess effects sealing and insulation between the closing cap and the zinc electrode. The pressure created is transferred thereby evenly by way of the cone and the disc to the upper edge of the depolarizing substance carrier.

This overcomes the disadvantages shown above for paperlined dry cells. The hollow conical shape of the insert described effects a demaining free space between the closing cap and the upper edge of the depolarizing substance carrier for expansion due to a volume increase of the electrolyte during discharge. The expansion of

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the carrier also is counteracted by the steady and even pressure of the plastic cone. The conical distance ring does not substantially increase the cost of a dry cell since it can be manufactured cheaply, e.g., by injection molding.

A preferred embodiment of the instant invention will now be shown with reference to the accompanying drawing. However, it should be understood that this is given merely by way of illustration, not of limitation, and that numerous changes may be made in the details without departing from the spirit and the scope of the invention as hereinafter claimed.

In the drawing, which is a longitudinal section through an entire dry cell, *a* is the solution electrode wherein is disposed the depolarizing substance carrier *b* and carbon rod *c*. Electrode *a* and carrier *b* are separated by a diaphragm *h* impregnated with electrolyte. On the upper edge of the carrier *b*, a disc *d* is disposed on which rests the plastic cone *e*. The upper closure of the dry cell is formed by metal cap *f* which is insulated from the solution electrode *a* by the flanged edge of the plastic cone *e*. Space *g* serves to receive electrolyte which expands upon discharge. On the outside of the solution electrode label *i* is disposed having a plastic layer. Between solution electrode *a* and the depolarizing substance carrier *b*, a bottom disc *k* is disposed.

I claim as my invention:

1. In a dry cell having a cup-shaped solution electrode; a depolarizing substance carrier disposed within said electrode and substantially filling the lower three-quarters thereof; a carbon rod vertically and concentrically disposed in said electrode, reaching from near the bottom of said carrier beyond the upper end of said electrode; a diaphragm impregnated with electrolyte and separating said electrode from said carrier; a metal closing cap at the upper end of said cell and also enclosing said carbon rod; a disc disposed on top of said carrier; and a distance ring directly above said disc; the improvements which comprise said distance ring having substantially the shape of a hollow cone and having a flattened lower end; said distance ring tightly enveloping said carbon rod; being seated on said disc; tightly fitting with its upper portion the walls of said electrode; thereby exerting a constant pressure on said depolarizing substance carrier; said distance ring and said electrode forming a space for expansion of gas and electrolyte liberated during actuation of said dry cell.

2. In a dry cell as defined in claim 1, the further improvement which comprises said distance ring, at its upper part, being provided with a notch, and said metal closing cap fitting in said notch.

3. In a dry cell as defined in claim 1, the further improvement which comprises said conical distance ring, together with said metal closing cap, forming the upper limit of said dry cell.

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