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LEAK-PROOF DRY CELL

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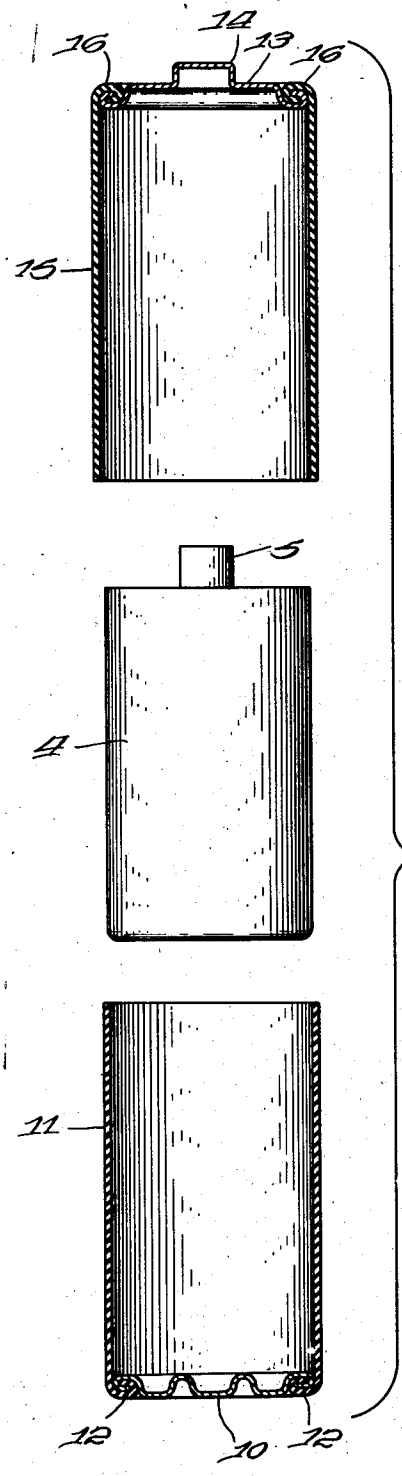


Fig. 3.

Fig. 1.

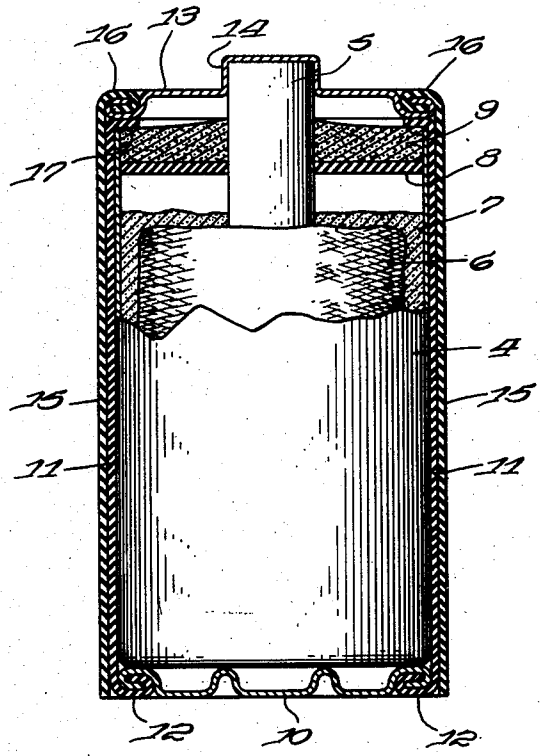
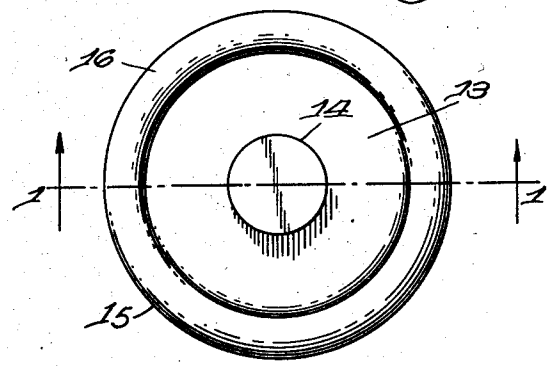


Fig. 2.



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LEAKPROOF DRY CELL

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3 Claims. (Cl. 136—133)

This invention relates to leak-proof dry-cells of the type used in flashlights and more particularly to improved telescoping protective shells which form the outer casing.

The primary object of the invention is to provide an improved dry-cell which will not swell or leak sufficiently to damage a flashlight casing or other equipment with which the cell may be used.

Another object of the invention is to provide an improved leak-proof dry-cell which is capable of withstanding great internal pressure but does not require a metal outer jacket.

A further object of the invention is to provide improved locking connections between the outer shells of the unit and their associated metal end terminals.

The invention is illustrated in a preferred embodiment in the accompanying drawing in which—

Figure 1 is a fragmentary vertical sectional view of a dry-cell embodying the invention, taken as indicated at line 1 of Figure 2; Figure 2 is a top plan view of the cell; and Figure 3 is an exploded view, with some of the parts in section, showing how the casing is assembled.

In the embodiment illustrated, a zinc electrode 4, which may be in the form of a cup, is provided with a central carbon electrode 5 surrounded by a bobbin 6 of depolarizing mix, immersed in electrolyte 7. An insulating washer 8 is provided in the upper portion of the zinc electrode and is impaled by the carbon electrode 5. Suitable sealing material 9 may be provided to close the upper portion of the zinc cup.

A metal disc 10 forms the bottom of the unit and is in electrical contact with the zinc electrode 4. A shell 11 is in the form of a cylinder and preferably is of strong fibrous material such as craft paper and which has been treated to render it moisture resistant and electrically non-conductive. The lower marginal portion of the shell 11 is curled inwardly and makes a tight interlocking connection with the marginal portion of the disc 10 as indicated at 12.

A metal top 13 is preferably provided with a socket 14 to tightly embrace the carbon electrode 5. Another cylindrical shell of non-conductive material 15 is secured by an interlocking connection to the metal top, as indicated at 16, and has an internal diameter which is slightly larger than the exterior of the shell 11 so that a tight telescoping fit may be made.

After the carbon electrode 5 and the depolarizing mix have been introduced into the zinc cup 4 and the sealing material 9 applied, the assembly is thrust downwardly into the shell 11 until the zinc electrode contacts the bottom terminal 10. The upper marginal portions of the shell 11 are then turned inwardly over the upper end of the zinc cup, as indicated at 17, and a suitable moisture resistant adhesive cement is applied. The top shell 15 is then telescoped over the assembly and the cap 13 may be crimped onto the carbon electrode.

It has been found that this construction will prevent loss of moisture through evaporation and is capable of withstanding any gas pressure which may be developed in the cell in normal use. It may be noted that the roll construction of the interlocking connections between the terminals and paper shells provides rounded corners which prevent damage to the metal parts even though subjected to rather rough handling.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, for some modifications will be obvious to those skilled in the art.

What I claim as new, and desire to secure by Letters Patent, is:

1. A leak-proof dry-cell provided with circuit terminals at opposite ends, comprising: a hollow cylindrical zinc electrode containing electrolyte; a centrally disposed carbon electrode and depolarizing mix in said electrolyte; a metal base electrically connected to said zinc electrode and forming an exposed bottom terminal for and of less diameter than the zinc electrode; a strong cylindrical shell of moisture resistant, electrically non-conductive material extending upwardly around the zinc electrode and having its lower marginal portion interlocked with and sealed in the marginal portion of said metal base; a metal top of less diameter than the zinc electrode and electrically connected to said carbon electrode and forming a top terminal therefor; and a strong cylindrical shell of moisture resistant, electrically non-conductive material having its upper marginal portion interlocked with and sealed in the marginal portion of said metal top and having its side walls extending downwardly in telescoping relation with the first mentioned shell and cemented thereto so as to make a tight permanent connection therewith.

2. A dry-cell as specified in claim 1, in which the cylindrical shell, which is locked to the base terminal, is co-extensive with and tightly embraces the side walls of the zinc electrode and is overlapped by the companion coextensive telescoping shell which is locked to the top terminal.

3. A dry-cell as specified in claim 1, in which the interlocking connection between each non-conductive shell and its end terminal is formed by curling the shell inwardly into an interlocking grip with the metal terminal and thereby presenting a rounded insulated shoulder portion, reinforced with metal, at each end of the cell.

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