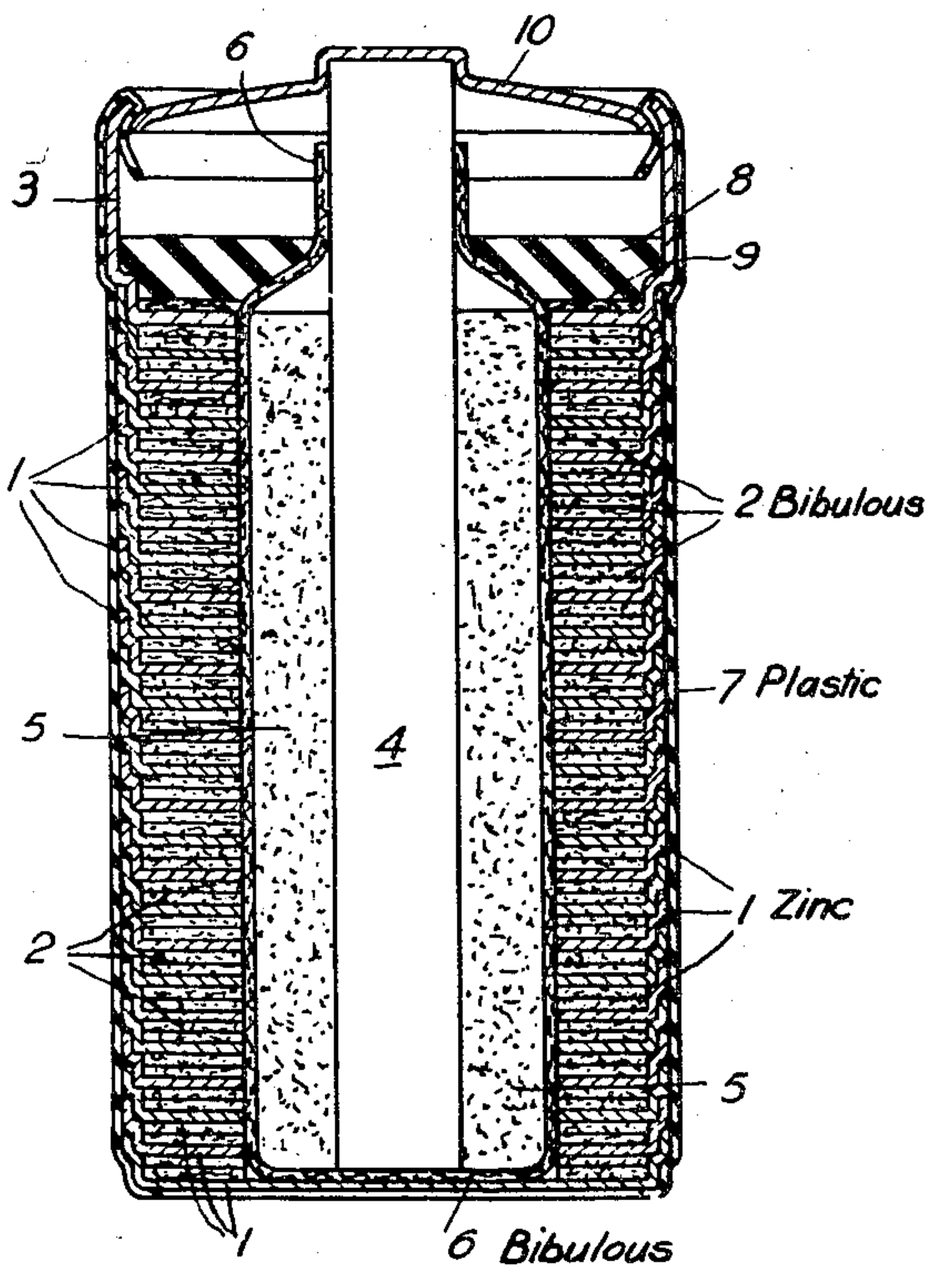
Oct. 31, 1950 R. P. RICHARDSON ET AL 2,528,178

PRIMARY ELECTRIC CELL

Filed May 28, 1948



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Patented Oct. 31, 1950

2,528,178

UNITED STATES PATENT OFFICE

2,528,178

PRIMARY ELECTRIC CELL

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Application May 28, 1948, Serial No. 29,888

6 Claims. (Cl. 136—107)

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This invention relates to the construction of primary electric cells, and especially of cells, such as those employing the system HgO/KOH/Zn, which need a negative electrode of large surface area if a substantial ampere hour output is to be got from a cell of moderate dimensions.

The invention is particularly concerned with the construction of the negative electrode. For the purpose of affording the desired large surface area the electrode is constructed of a number of shallow zinc cups shaped to nest tightly one within the other and each, except the bottom one, with a hole in its bottom.

The cell may conveniently be constructed as a dry cell in which case one or more bibulous washers is placed in each cup to contain the electrolyte.

The invention is illustrated in the accompanying drawing which shows a longitudinal section through a dry cell constructed according to the invention.

The zinc cups are indicated at 1 and it will be seen that their walls are slightly inclined to form a conical or pyramidal surface so that each cup can nest tightly into the one beneath it, the inclined walls coming into good metallic contact. When the cups are thus nested there is still space between the bottom of one cup and that of the next to receive electrolyte. In the case of a dry cell this electrolyte is absorbed by and held in one or more bibulous washers 2.

In the preferred form of cup shown the internal dimensions of the cup at its upper part are increased to the external dimensions of the bottom part of the cup as is necessary for nesting, chiefly by forming the walls of the cup with a shoulder.

The bottom cup 1 is whole; all the rest have a wide opening in the middle. At the top of the pile of cups is placed a deeper, slightly larger and stouter zinc cup 3. The assembled pile may be secured in a jig and dipped in bitumen so as to become coated up to the nesting part of the top cup and then be passed through a gauge to reduce the bitumen coating to uniform and suitable thickness, or it may be sheathed in a tube of plastic 7, preferably of polyvinylchloride.

In the central space in this pile formed by the contiguous central openings in the zinc cups 1 and washers 2 there is placed a dolly consisting of an iron or carbon electrode of rod form 4 surrounded by a bobbin 5 of compressed mercuric oxide suitably wrapped, for example in porous paper 6, and tied about the rod 4 with thread. After insertion of this dolly a caustic potash solution is added. This causes the paper washers 2 and the paper wrapping 6 upon the dolly to swell so that good conductive contact is established from the central electrode 4 to practically all the surface of the zinc cups 1.

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The upper edge of the sheath 7 is turned over the lip of the top cup 3. This cup may be filled with a sealing compound 8 upon a clip washer 9. The top of the cell is closed by a domed metal washer 10 contacting with the electrode 4 and held at its rim by the spinning inward of the plastic-covered lip of the cup 3.

We claim:

1. In a primary electric cell a negative electrode built up of a number of shallow zinc cups nesting tightly one within the other and each except the bottom one having a hole in its bottom.

2. A primary electric cell comprising a negative electrode built up of a number of shallow zinc cups nesting tightly one within the other and each except the bottom one having a hole in its bottom, at least one bibulous washer in each cup impregnated with electrolyte and a positive electrode passing through the holes in the zinc cups and the washers.

3. A primary electric cell comprising a negative electrode built up of a number of shallow zinc cups nesting tightly one within the other and each except the bottom one having a hole in its bottom, electrolyte contained in the space between the said zinc cups, and a positive electrode surrounded by a wrapped bobbin of mercuric oxide inserted in the central opening through the bottom of the zinc cups.

4. A primary electric cell comprising a negative electrode built up of a number of shallow zinc cups nesting tightly one within the other and each except the bottom one having a hole in its bottom, electrolyte contained between the zinc cups, a positive electrode and depolariser filling the central opening through the bottom of the zinc cups, a sheathing of plastic enclosing the zinc cups and turned over the lip of the top cup and a metal cap forming the positive terminal of the cell held in contact with the positive electrode by the insulating inturned lip of the top cup.

5. A primary electric dry cell comprising a number of shallow zinc cups each except the bottom one having a hole in its bottom and fitting within and in rubbing contact with its neighbour, thereby forming a fluid-tight container, bibulous material impregnated with electrolyte filling the space between the bottom of one cup

and the bottom of the next, and a positive electrode and a layer of depolarising material surrounding said electrode passing through the zinc cups and the bibulous material and making contact with the latter.

6. In a primary electric dry cell the combination of a number of shallow zinc cups, each with a hole in the bottom, shaped to nest one in the other, bibulous washers interleaved between the bottoms of neighbouring cups, cups and washers forming together a close-stacked pile, and a positive electrode surrounded by a bobbin of depolariser passing through the bottoms of all the cups.

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