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Bogotá, D.C. 15 DE MAYO DE 2007

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 03-097823- -00006-0000

Fecha: 2007-05-15 15:48:35 Dep. 2020 NUECREACIONE  
Tra. 2 PATENTES Eve: 1 REGDEPOSITO  
Act. 487 SOLICIPRORROGA Folios: 2

SEÑORES  
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO  
DIVISION DE NUEVAS CREACIONES  
CIUDAD

|        |            |              |
|--------|------------|--------------|
| ASUNTO | Radicación | No. 03/97823 |
|        | Trámite    | 002          |
|        | Evento     | 001          |
|        | Actuación  | 430          |
|        | Oficio     | 2323         |

Por Medio de la presente solicito a usted, una prorroga de 30 días para que pueda contestar el requerimiento hecho por usted según oficio No. 2323 fijado el 15 de febrero de 2007.

Atentamente;

*Mario Yankel Alvarez Segura*

MARIO YANKEL ALVAREZ SEGURA  
CC. 19.176.889 DE BOGOTÁ, D.C.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 03-097823- -00006-0000

Fecha: 2007-05-15 15:46:35 Dep. 2020 NUECREACION  
Tra. 2 PATENTES Eve: 1 REGDEPOSITO  
Act. 467 SOLICIPRORROGA Folios: 2

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 900176089-2

RECIBO OFICIAL DE CAJA : 07 - 38,810  
FECHA : MAYO 15 DE 2007

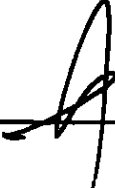
\*\*\*\*\* CONSIGNACION \*\*\*\*\*

| DEPOSITANTE  | TIPO PAGO    | BANCO         | CUENTA      | No. PAGO | FECHA PGO  | Vr. PAGO  |
|--------------|--------------|---------------|-------------|----------|------------|-----------|
| MARIO YANKEL | CONSIGNACION | BANCO POPULAR | 050-00110-6 | 55091034 | 15/05/2007 | 72,000.00 |
| MARIO YANKEL | CONSIGNACION | BANCO POPULAR | 050-00110-6 | 55091036 | 15/05/2007 | 2,000.00  |

\*\*\*\*\* CONCEPTO \*\*\*\*\*

| CANT. | RENTISTICO  | CONCEPTO                | TOTAL CONCEPTO |
|-------|-------------|-------------------------|----------------|
| 1     | 50005-01-08 | PRORROGA DE TERMINOS    | 72,000.00      |
|       |             | 31 PRORROGA DE TERMINOS | 72,000.00      |
|       |             | TOTAL :                 | \$ 72,000.00   |

SOM: SETENTA Y DOS MIL PESOS

RESPONSABLE : \_\_\_\_\_ 

[54] DRY CELL BATTERY

[76] Inventor: Mario Y. Alvarez Oscar Milla, both of Avenida 29 No. 14-82, Bogota, Colombia

[21] Appl. No. 775,188  
[22] Filed Mar. 1, 1977

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1,251,021 10/1916 Mitchell et al. \_\_\_\_\_ 428/190  
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FOREIGN PATENT DOCUMENTS

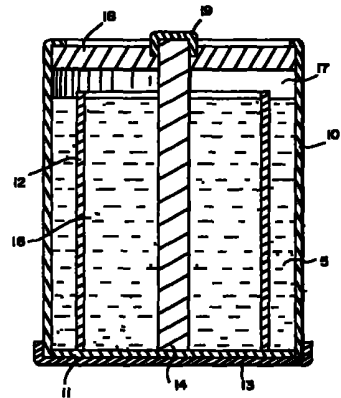
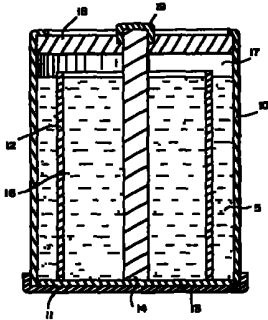
614027 5/1928 United Kingdom  
Primary Examiner—Anthony Simpson  
Attorney, Agent, or Firm—Beverly and Palmer

[57] ABSTRACT

A dry-cell battery construction includes a zinc electrode and a graphite electrode. An internal electrolyte of a wet paste material from vegetal origin connects the zinc electrode. The internal electrolyte is particularly raw potato material of the flesh of the potato peepers. The filler material which connects the graphite electrode contains carbon black. The carbon black may be any type black, but can be carbon black of other types, preferably petroleum black, but also even black or the like, including carbon black produced from natural gas.

17 Claims, 1 Drawing Figure

Related U.S. Application Data  
Continuation-in-part of the No. 657,383, Feb. 11, 1976, which is a continuation-in-part of the No. 446,688, Feb. 18, 1974, abandoned.  
Foreign Application Priority Data  
Nov. 9, 1975 [52] Colombia \_\_\_\_\_ 141879  
[51] Int. Cl. \_\_\_\_\_ H01M 6/04  
[52] U.S. Cl. \_\_\_\_\_ 428/164; 428/224; 428/225;  
428/164; 428/224; 428/225;  
[53] Field of Search \_\_\_\_\_ 428/224, 225, 226, 194,  
428/223, 216, 164, 159, 199  
References Cited  
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215,289 5/1879 Hanning \_\_\_\_\_ 428/196  
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4,348,945

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NEW CELL BATTERY

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of the copending application of Mark Yundel Adams et al. entitled "Electrolyte Device" filed Feb. 11, 1976 under Ser. No. 677,250 which, in turn, is a continuation-in-part of the application of Mark Yundel Adams et al. entitled "Dry Battery Construction" filed Feb. 26, 1974 under Ser. No. 446,893, and now abandoned. The disclosure of these prior applications are incorporated herein entirely by reference.

FIELD OF THE INVENTION

This invention relates to a dry cell which includes carbon black, preferably petroleum black, and zinc as constituents of the depolarizing solution or internal electrolyte which is contained about its carbon electrode, this internal electrolyte being placed within a zinc capsule whose interior surface, in turn, is hermetically sealed by an organic electrolyte, preferably composed of the first carbon paste, and sealing in zinc and electrolyte.

BACKGROUND OF THE INVENTION

The dry-cell construction Leclanche devised by 1860 affords the basic principle on which the present zinc dry or primary batteries are constructed. According to Leclanche's construction, a carbon plate or rod was surrounded by a solution of powdered carbon and ammonium chloride, with an amount of 10-20 weight percent ammonium chloride solution. Manganese dioxide was sometimes added. As the battery ran, zinc dust was lost.

A 1.5 volt changing reaction was obtained. From such cells the reaction slowly dropped off, with an initial average value being from 1.2 to 1.5. During its lifetime, the original reaction was nearly wholly ignored, the battery being so particularly useful for intermittent action.

The general chemical reaction involved is now so pointed as follows:



Dr. Carl Oleson in 1888 improved the Leclanche cell, emphasizing the first dry-cell battery. This improved battery was composed of a zinc case, sealing in both the battery anode and its cathode. A gel-like electrolyte was put up within such container and a carbon rod, enclosed by depolarizing solution, was inserted at the center thereof. This is the basic construction followed at the present for manufacturing commercial dry batteries, of any model, which are extensively used to generate low-voltage electric power.

Recently, the electrolyte formulation used for dry batteries has consisted of a gel-like body containing therein about 20 weight percent ammonium chloride and 9 weight percent zinc chloride, arranged between the battery anode and cathode. Such gummy paste usually comprises a mixture of the electrolyte substances and zinc starch and wheat meal. Synthetic materials offering improved electrical properties and longer shelf life,

such as methylcellulose, Cellulose and the like, are also used.

It is well known that during the discharging process the battery electrolyte changes in composition. In the latter adjustment the zinc chloride the pH value changes from about 5.7 to about 3.5 (this becoming more acidic) while in the meantime the pH of the solution changes from about 5.5 to 11 (more alkaline).

Dry batteries comprising the attached conventional electrolyte, generally show a steady slow rate characteristic of discharge, until reaching the 1-volt final voltage, when discharging at 20° C. The electrical reaction of the battery substantially decreases as it discharges. The rated capacity depends upon, therefore, the intended final voltage. For commercial purposes, when testing commercial zinc D batteries, at a 4 ohm load, the results are forth in the following Table I are obtained, for different final voltages.

TABLE I

| Final Voltage | Time in Hrs. | At 20° C. | At 30° C. | Weight |
|---------------|--------------|-----------|-----------|--------|
| 1.4           | 0            | 0         | 0         | 0      |
| 1.2           | 0.2          | 0.244     | 0.17      | 0.2    |
| 1.0           | 0.2          | 0.244     | 0.17      | 0.2    |
| 0.8           | 1.0          | 0.98      | 0.7       | 0.87   |
| 0.6           | 1.0          | 0.97      | 0.7       | 0.85   |

Another kind of electrolyte was 20 weight percent caustic soda, in which the zinc case later reacted to form sodium zincate, the hydrogen released being absorbed at the carbon surface by the atmospheric oxygen contained within the electrolyte, thus spending air at a rate above 1 liter in one hour. In order to decrease the hydrogen loss consumption, sodium hydroxide, which is normally caustic, is added to the electrolyte, thereby forming soluble sodium zincate being an oxidized form of sodium hydroxide. The electrolyte in this latter kind of dry battery is held in place by adding therein zinc starch paste. Presumably, the substance 1.5 ampere-hour dry battery can be constructed.

Also, the electrolyte may be composed of 35-40 weight percent potassium hydroxide saturated with sodium chloride, prepared in a slightly alkaline. The chemical action of batteries have a rather short life as mentioned in that one attributable to the batteries according to the invention as claimed in the above-mentioned U.S. patent application for No. 677,250 and 446,893.

It is known to provide, as the depolarizing solution in conventional dry cells, a mixture which includes ammonium chloride, graphite, animal cells, carbon black, ammonium chloride, zinc chloride and other less important constituents. It is believed that carbon black, as compared to other types of carbon black, has been used because of its relatively superior low resistance and superior absorption characteristics. The use of other types of carbon black has not proved feasible in the construction of commercial dry cell batteries.

While it has been proposed, as known from U.S. Pat. No. 215,695, to use zinc as an electrolyte (anode) in Oleson's battery, it has not been known how to use zinc in a dry cell to reduce its internal resistance and to increase the absorption of carbon black.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a dry cell battery which contains a depolarizing solution

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or internal electrolyte which need not include carbon black.

It is another object of the present invention to provide a dry cell battery which includes a depolarizing solution or internal electrolyte containing a carbon black other than carbon black, preferably petroleum black.

It is a further object of the present invention to provide a dry cell battery which includes carbon black and has an extended life and improved characteristics, using as internal electrolyte one made up of or equal substances such as carbon paste.

It is an additional object of the present invention to provide a depolarizing solution suitable for use in dry cell batteries.

The foregoing objects are achieved, in accordance with the present invention, by providing a dry cell battery having among the constituents of its depolarizing solution or internal electrolyte carbon black and zinc.

The carbon black, in accordance with the present invention, is preferably petroleum black, but may also be even black or the like, as well as carbon black.

Applicants have discovered that it is a dry battery comprising an anode and a cathode separated from one another by means of a permeable web, such as diaphragm paper, a new paste material from vegetal origin, especially paste material from the fruit of the papaya, is used as the battery internal electrolyte according to this invention, especially a longer lasting action characteristic of discharge is obtained, with much discharge current at a more steady rate, as contrasted to the whole performance of the prior art batteries. This type of battery is further improved by using as constituents of its depolarizing solution zinc and carbon black which gives for greater power of absorption.

The unique barrier heretofore to the substitution of zinc as anode of carbon black, such as petroleum black, for carbon black in dry cells is believed to lay in that there are two phases and insufficiently absorbed, and consequently not up for use in the internal electrolyte. Applicants have found that by adding ammonium chloride, graphite, ammonium chloride plus zinc, petroleum black and the like have their power of absorption greatly enhanced, making such blacks equally equal to that of carbon black. The substances of the anode are believed to be absorbed in such a manner that they convert the groups of substances of the petroleum black and the like, making them black more conductive and stable in the manufacture of dry cells similar as to voltage, impedance, durability and use to those made with carbon black.

Absorption has been found by applicants to be substantially and equally high when the depolarizing solution consists of the zinc case, carbon black, graphite, ammonium chloride, and ammonium chloride as a conventional, and on the other hand, petroleum black, graphite, ammonium chloride, ammonium chloride plus zinc in accordance with the present invention.

Hence, by treatment with zinc in the depolarizing solution, petroleum black and the like are made to have absorption characteristics similar to those of carbon black. These results are apparent while the dry cell contains if the paste of a fruit, preferably carbon paste, gelatin with zinc leaves gelatinous (starch, etc.) and dried with a drying agent such as wheat meal, coffee, etc., is used as the internal electrolyte, thereby providing

ing a dry cell of 1.5 volts and up to 6 ampere with equal or greater effectiveness than the Leclanche type cells.

An electrolyte which may be used in a dry cell battery according to the present invention is composed of new paste material of vegetal origin, in particular of new paste of fruit of the carbon papaya (Carica papaya). By the term "new material of vegetal origin" and through-out this description, new pulp of fruit of plants and pulp of new cells is meant. If desired, such paste material may contain compressed charcoal, animal or synthetic animal agents, such as yeast starch, zinc starch, wheat meal, whole cereals, and the like or gelatinous. Particularly suitable for forming the electrolyte is the paste obtained from the fruit of any kind of the vegetable of carbon papaya (Carica papaya). This fruit is commonly known as the papaya. The dry battery containing the electrolyte of papaya paste shows a steady increase drop rate, rather than the jerky-like drop from one voltage level to another lower one, as in the case with the prior art batteries.

BRIEF DESCRIPTION OF DRAWINGS

The title FIGURE of drawing is an elevational, cross-sectional view of a dry cell battery according to an illustrative embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The fruit paste of papaya or other fruit may be formed by liquefying the fruit and thoroughly mixing therewith the starch. The mixture is heated to about 100° C. with continuous stirring. When the paste has dried to some extent, substances may be added. For example, wheat meal may be added as drying agent thereby and heated to keep the mixture boiling at 100° C. until a thick and sticky gel is formed which may suitably be allowed to be the internal electrolyte of the battery shell.

The pulp of fruits is composed of a number of vegetable components, varying as to interest and value, depending on the solvent used. Among such vegetable components there are organic acids, carbohydrates and protein composed of high-weight molecules. Without attempting to be limited to any particular vegetable source, it may be pointed out that such high-weight substances, probably on hydrolysis converting in the electrolyte process performed in the dry battery, undergo structural changes of wet cell battery action, but that as a result they yield into lower substances which are capable of solution with this mixture thus offered to the system by the zinc case, the ammonium chloride and zinc starch in two amounts found as ingredients in the cell container.

It is known that the metal electrode forms are generally more soluble than the salts of their own metal and that, therefore, they will form a bridge of continuous substitution, thus permanently acting as electrolyte for the dry battery comprising new paste of fruit of plants. The mechanism of the process performed is not well known at the present, but its novel improved effectiveness is brought out by means of the following illustrative, non-limitative example.

EXAMPLE

To 7.60 g. of paste formed from the fruit of the carbon papaya there is added in gelatinous 1.50 g. of yeast starch and 1.60 g. of wheat meal or coffee or drying agent with thorough mixing. The so-prepared mixture was gently heated at about 100° C. for 25 minutes using



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efficiency. The voltage and current of these batteries, however, declined rapidly in comparison to batteries constructed with a depolarizing substance in accordance with the present invention.

Using the same depolarizing substance as set out above, including blower cathode, but substituting a paste of fruit of the onion papaya for the conventional animal electrolyte, a battery similar having an initial voltage of 1.3 volts, a current of 1.0 amp and a somewhat longer life, but again the voltage and current fell rapidly in comparison to similar batteries using the depolarizing substance of the present invention.

In a similar experiment 20% by weight parts of other organic substances, such as guava, apple, plumapple, banana or the like were added to a zinc-carbon depolarizing substance consisting essentially 60% carbon black and 40% manganese dioxide, by weight. When this substance was used in a battery having a conventional animal electrolyte, an initial voltage of 1.3 volts with current in the range of from 1.1 to 1.3 amperes were obtained. If papaya in a gelatinous form is substituted for the conventional animal electrolyte and used with these depolarizing substances, initial voltage 1.4 volts and initial currents of from 1.0-1.5 amperes were obtained. Cells so constructed exhibited better results than those using a solution of the blower type as set out above nevertheless, life of these zinc-carbon battery batteries was still short in comparison to batteries of the present invention.

It can thus be seen that the use of water in the depolarizing substance gives unexpectedly superior results from other electrolytes.

It is to be understood that the various substances mentioned above which can form the depolarizing substance according to the present invention, can in one preferred aspect of the invention, be pressed under pressure into shaped bodies, such as a web which can be formed into a spiral. These bodies shaped under pressure provide a somewhat increased current capacity for the depolarizing substance when used in a battery, as compared to the mass solution which has not been subjected to pressure. It is to be appreciated that the chemical and structural embodiments of the present invention have been set out by way of example, not by way of limitation. Other embodiments and numerous variants are possible within the spirit and scope of the present invention, its scope being defined in the appended claims.

What is claimed is:

1. In a dry cell battery having at least two electrodes spaced apart from one another an electrolyte produced in-situ between said two electrodes and a depolarizing substance positioned adjacent one of said electrodes, the improvement wherein the depolarizing substance consists essentially of carbon black, an oxygen producing substance, paste of fruit of the onion papaya and water.

2. An improved dry cell battery in accordance with claim 1, wherein said carbon black is acetylene black.

3. An improved dry cell battery in accordance with claim 1, wherein said carbon black is carbon black produced from natural gas.

4. Improved dry cell battery in accordance with claim 1, wherein said carbon black is thermal black.

5. An improved dry cell battery in accordance with claim 1, wherein said carbon black is petroleum black.

6. An improved dry cell battery in accordance with claim 1, wherein said carbon black is oven black.

7. An improved dry cell battery in accordance with claim 1, wherein said oxygen producing substance is manganese dioxide.

8. An improved dry cell battery in accordance with claim 1, wherein said depolarizing substance consists essentially of about 51.6% carbon black, about 23.9% manganese dioxide, about 12.5% paste of fruit of the onion papaya and about 10% water, by weight.

9. A depolarizing substance useful in dry cells, the substance consisting essentially of carbon black, water, manganese dioxide and paste of fruit of the onion papaya, the said paste and water being present or compressed.

10. A depolarizing substance useful in dry cells consisting essentially of about 51.6% carbon black, about 23.9% manganese dioxide, about 12.5% paste of fruit of the onion papaya and about 10% water, by weight.

11. A depolarizer comprising a porous body formed by sintering pyroxene to a solution consisting essentially of carbon black, manganese dioxide, paste of fruit of the onion papaya and water.

12. A dry cell comprising at least two electrodes, spaced from one another, an internal organic electrolyte located between said electrodes and a depolarizing substance or internal electrolyte adjacent to one of said electrodes, said substance including water, carbon black, manganese dioxide and paste of fruit of the onion papaya.

13. A dry cell according to claim 12, wherein said carbon black is petroleum black.

14. A dry cell according to claim 12, wherein said carbon black is acetylene black.

15. A dry cell according to claim 12, wherein said carbon black is thermal black.

16. A dry cell according to claim 12, wherein said carbon black consists essentially of approximately 51.6% petroleum black, 23.9% manganese dioxide, 12.5% paste of fruit of the onion papaya and 10% water, by weight.

17. A dry cell comprising at least two electrodes, spaced from one another, an internal organic electrolyte located between said electrodes and a depolarizing substance or internal electrolyte adjacent to one of said electrodes, said substance including water and carbon black, and wherein said internal electrolyte consists essentially of 100% paste of fruit of the onion papaya and said electrodes are made respectively of graphite and zinc.

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