

Specification No. 83365. Application No. 83365 dated 31st July 1962. Complete Specification left on 16th May 1963. (Application accepted 29th November 1963.)

PROVISIONAL SPECIFICATION.

MAGNESIUM COPPER SULPHATE NONPOLARISABLE BATTERIES.

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, OLD MILL ROAD, NEW DELHI-1, INDIA, AN INDIAN REGISTERED BODY INCORPORATED UNDER THE REGISTRATION OF SOCIETIES ACT (ACT XXI OF 1860).

The following specification describes the nature of this invention.

THIS IS AN INVENTION BY DR. PREM BEHARI MATHUR AND NITYANANDAN JOHN PAUL OF THE CENTRAL ELECTROCHEMICAL RESEARCH INSTITUTE, KARAIKUDI-3, INDIA, BOTH INDIAN CITIZENS.

This invention relates to the manufacture of magnesium and copper sulphate cells and batteries.

Compactness, nonpolarisability, high ampere hour capacity and simplicity of fabrication are some of the outstanding features of a new cell system. The system consists of magnesium and copper (or copper deposited over carbon) as electrode materials and copper sulphate solution as electrolyte. No external separator like cellophane paper is needed. When a magnesium electrode is dipped in copper sulphate solution, it develops over its surface a layer of insoluble material which acts as a natural separator between the anode and the cathode and eliminates the danger of short circuiting of the electrodes, and allows compact packing, without offering any resistance to the flow of current. The sulphate solution acts both as electrolyte and depolariser. The cell is capable of giving a very high current per square inch of the magnesium surface. The working voltage of the cell lies between

0.5 and 1.5V, and the open circuit voltage is 1.6-1.9V. This system does not get polarised at any rate of drainage of current and is thus useful for continuous high drains. The activation time of the cell system is of the order of a few seconds and the ampere hour capacity per unit weight of the active materials is very high. By controlling the concentration of the electrolyte solution, the cell can be discharged continuously at constant voltage and constant current. Light and compact batteries are made in plastic structures.

R. BHASKAR PAI

Patent Officer,

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH.

Dated this 6th day of July 1962.

COMPLETE SPECIFICATION.

MAGNESIUM COPPER SULPHATE NONPOLARISABLE BATTERIES.

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, OLD MILL ROAD, NEW DELHI-1, INDIA, AN INDIAN REGISTERED BODY INCORPORATED UNDER THE REGISTRATION OF SOCIETIES ACT (ACT XXI OF 1860).

The following specification particularly describes and ascertains the nature of this invention and the manner in which it is to be performed.

THIS IS AN INVENTION BY DR. PREM BEHARI MATHUR AND NITYANANDAN JOHN PAUL OF THE CENTRAL ELECTROCHEMICAL RESEARCH INSTITUTE, KARAIKUDI-3, INDIA, BOTH INDIAN CITIZENS.

The invention relates to a magnesium primary cell system having copper and magnesium as electrode materials and copper sulphate as the electrolyte.

Magnesium and copper are used in the form of thin plates, foils, ribbons or rods. In place of copper any material coated with copper can be used. The copper sulphate is in the form of anhydrous powder or crystals or solution or a paste coated over a separator, like cotton.

The system has the following advantages:

1. The system is simple to fabricate; it is light and compact;
2. Even small size cell can deliver appreciably high current at useful voltage;
3. The cell system does not get polarised even at heavy rate of drainage of current;
4. When the cell starts functioning, a layer of insoluble material develops over the magnesium, and this layer acts as a natural separator between the electrodes;
5. Copper electrode can be used over and again.

This magnesium cell or battery system may find wide applications as activated type of cell system in defence

and meteorological appliances, in toys, for demonstration in educational institutions, for use in villages and remote places where the power supply is not available or for domestic purposes at the time of power shut down.

Various types and sizes of batteries for specific purposes, can be made, from the present cell system. (Ref.: Mathur, P.B., and Paul, N. J., Indian J. Appl. Chem., 25, 1 (1962) 1, J. Chem., Edn., (USA) 40, (1963) 43).

We claim:

A magnesium cell or a battery system comprising magnesium and copper or copper deposited on another material as electrodes and copper sulphate solution or powder or paste as the electrolyte.

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Dated this 14th day of May 1963.

Price : TWO RUPEES.