

Specification No. 95422. Application No. 95422, dated 31st August, 1964. Complete Specification left on 16 May 1965. (Application accepted 16th May 1966.)

PROVISIONAL SPECIFICATION.

Index at acceptance—14B & D2 [LVII(1)].

IMPROVEMENTS IN OR RELATING TO THE CONSTRUCTION OF SINGLE SHOT BATTERIES.

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, RAJI MARG, NEW DELHI-1, INDIA, AN INDIAN REGISTRATION OF SOCIETIES ACT (ACT XXI OF 1860).

The following specification describes the nature of this invention.

This is an invention by PATTARAKALAM LUKOSE JOSEPH, Citizen of India; MICHAEL ANGELO VINCENT DEVANATHAN, Citizen of Ceylon; BALKUNJE ANANTHA SHENOI, Citizen of India; VENKATARAMAN BALASUBRAMANIAN, Citizen of India, employed in the Central Electrochemical Research Institute, Karaikudi.

This invention relates to improvements in or relating to anode material for single shot battery.

Hitherto it has been proposed to use Magnesium, Zinc as anode material.

This is open to the objection that Magnesium is not available in India and Magnesium and Zinc give lower voltages than the present material.

The object of this invention is to obviate these disadvantages by using Aluminium in place of zinc or magnesium in primary cells together with any conventional depolarizer.

To these ends, the invention broadly consists in using aluminium or aluminium alloy anode in combination with a suitable separator soaked in saturated solution of a mercury salt and dried.

The following typical examples are given to illustrate the invention:

Anode	—Pure aluminium
Amalgamating agent	—0.02—0.5 gms of mercury salt per sq. cm. area of the anode.
Electrolyte	—Sodium chloride, Ammonium chloride, Zinc chloride, Aluminium chloride.
Cathode material	—Manganese dioxide/Carbon

The following are among the main advantages of the invention :

1. The cell gives open circuit voltage of 2.5 volts
2. The anode polarisation is very little
3. Ingredients can be packed dry and cell can be activated by adding water.

R. BHASKAR PAI,

Patent's Officer,

Council of Scientific & Industrial Research.

Dated this 24th day of August 1964.

COMPLETE SPECIFICATION.

IMPROVEMENTS IN OR RELATING TO THE CONSTRUCTION OF SINGLE SHOT BATTERIES.

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, RAJI MARG, 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 PATTARAKALAM LUKOSE JOSEPH, citizen of India, MICHAEL ANGELO VINCENT DEVANATHAN, citizen of Ceylon, BALKUNJE ANANTHA SHENOI and VENKATARAMAN BALASUBRAMANIAN, both citizens of India, all of the Central Electrochemical Research Institute, Karaikudi-3, S. Ry., India.

The invention relates to improvements in or relating to the construction of single shot batteries and has particular reference to anode material for single shot batteries.

Since the materials of construction of single shot batteries are wasted as soon as they are used, they should be made up of cheap materials. Often they require very high ampere-hour output for short duration.

Hitherto it has been proposed to use zinc or magnesium as anode material for single shot batteries. This is open to the objection that magnesium is not available in India and magnesium give lower anode potentials and ampere hours per gram in neutral or alkaline solutions compared to the material of this invention.

The object of this invention is to obviate these disadvantages by using aluminium or aluminium based alloys in the form of sheet or powder sintered or compressed in place of zinc or magnesium in primary cells together with any conventional depolarizer, organic depolarizer or any other cathode material such as silver oxide, manganese dioxide, mercuric oxide, copper oxide and lead dioxide and electrolytes acid, alkaline or neutral.

The present invention consists in using amalgamated aluminium electrode as anode material, the amalga-

tion being done by the mercury compounds which are added to the electrolyte or cathode mix of the cell. Alternately, the amalgamation of the anode can also be effected by a compound formed by the action of potassium iodide and mercuric oxide added to the cell electrolyte or cathode mix. Mercuric oxide and potassium iodide are inactive in the dry state; but when water is added they react together forming the active mercury compound in solution.

The following examples are given to illustrate the invention:

Aluminium or aluminium based alloys in the form of sheet or sintered powder is taken as the anode material of the cell. The anode area is determined by the current output desired, one sq. cm. area for 100 mA current will be convenient. Next to the anode is placed a separator (absorbent paper, cotton pad or synthetic diaphragm) which may be soaked in a solution of mercury salt and dried. Next to the diaphragm is placed the cathode material which may contain besides the cathode mixture and cell electrolyte 0.05—0.5 gm of mercury salt per sq. cm. of the anode area.

EXAMPLE I

—ive		+ive
25 alloy sheet or sintered powder anode	Diaphragm soaked mercury salt and dried	Cathode mix eg MnO_2-C and electrolyte $NH_4Cl, ZnCl_2$ and mercury salt

Price : TWO RUPEES.

The cell is activated by adding water or a solution of ammonium chloride and zinc chloride.

EXAMPLE II.

-ive	Anode	+ive
Super purity aluminium	Diaphragm soaked in potassium iodide and dried	Cathode mix- ture eg HgO —C, KI

The cell is activated by adding potassium solution. The following are among the chief advantages of the invention:

1. The cell prepared according to the invention can be stored for any length of time without causing damage or loss in activity.

2. A cell thus prepared and stored gives anode potentials of the order of 1.4—1.6V against saturated calomel electrode when activated by adding neutral solutions of sodium chloride or water. To give higher potentials of the order of 1.6—1.9V, the cell is activated by adding 4M potassium hydroxide solution.

3. Anode potential can be varied by adjusting the amount of mercury salt from .05 gm to .5 gm per sq.cm. area of the anode surface.

4. When activated the cell produces much heat due to amalgamation and hence works efficiently even at low temperatures, e.g., 0° C.

We claim:

1. A method of construction of single shot batteries which consists in mixing with the cell electrolyte or cathode mix mercury compounds where mercury occurs in the cation or anion.

2. A method as claimed in Claim 1 wherein the activating mercury salt is either added to the cell electrolyte or cathode mix in amounts equal to .05—.5 gm per unit area of the anode or is later produced by the action of potassium iodide and the mercury compound added to the cell electrolyte or cathode mix in the presence of water, which is added to activate the battery just before use.

R. BHASKAR PAI,

Patents Officer,

Council of Scientific and Industrial Research,

Dated this 28th day of June 1965.