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IMPROVEMENTS IN OR RELATING TO PROCESS FOR MAKING DRY CELLS

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

THIS IS AN INVENTION BY HANDADY VENKATAKRISHNA UDUPA, DIRECTOR, MAHADEV GOVIND POTDAR, SCIENTIST,
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PROVISIONAL

The following Specification describes the nature of this invention.

This invention relates to improvements in or relating to
Leclanche type Dry cells.

Hitherto it has been proposed to make the dry cells of
the cylindrical type in the conventional manner wherein the
paste electrolyte is added to the clean zinc can and the
bobbin of black mix is inserted into the can so that the
paste electrolyte rises in the annular space up to the
shoulder of the bobbin. The cell is then cooked in water
bath at 80-90°C for five minutes to immobilise the paste
electrolyte. The cell is then allowed to cool for a day
before sealing.

This is open to the objection that the unit operation
involving cooking which is a slow operation becomes the
controlling factor in a battery industry affecting the produc-
tion capacity.

The object of this invention is to obviate these
disadvantages by avoiding the cooking operation altogether
from the process of making dry cells thereby increasing out-
put capacity.

To these ends the invention broadly consists in the
development of a process of making dry cells without the
use of cooking operation to immobilise the paste. This
has been done by the addition of compounds such as salts
of aromatic hydroxy acids and alkalies either individually
or in combination to the paste electrolyte to immobilise the
same in cold.

The following typical examples are given to illustrate
the invention :

Example 1

Cells were assembled by addition of sodium salicylate
7-10% W/v and salts of alkali metal group such as lithium,
sodium, potassium, rubidium and caesium 0.001 to 1% to
the paste electrolyte compound as described in Indian
Patent No. 103216, containing ammonium chloride, zinc
chloride, water, starch, carboxymethyl cellulose, flour, mer-
curic chloride.

The paste electrolyte gets immobilised within 2 to 5
minutes. The cell is then sealed straightaway.

The cells on continuous discharge through 4.5 Ohms
give the same performance; i.e. these show 1 volt after 3
hours and 0.75 volts after 6 hours as the normal cells made
in conventional manner by cooking.

The following are among the main advantages of the
invention :

1. Cells made with cold set electrolyte give comparable
performance with those made in the conventional
manner.
2. This invention eliminates the unit operation of cook-
ing thereby gets over the bottleneck in the running
industry.
3. It helps reduce overall cost of production for a dry
cell manufacturing company.

COMPLETE

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

This invention relates to improvements in or relating to
Leclanche type dry cells.

Hitherto it has been proposed to make dry cells of the
cylindrical type in the conventional manner wherein the
paste electrolyte is added to clean zinc can and the bobbin
of black mix is inserted into the can so that the paste electro-
lyte rises in the annular space up to the shoulder of the
bobbin. The cell is then cooked in water bath at 80-90°C
for five minutes to immobilise the paste electrolyte. The
cell is then allowed to cool for a day before sealing.

This invention avoids the cooking operation altogether
from the process of making dry cells.

According to this invention the process of making dry
cell without cooking operation consists in mixing the ingre-
dients of black mix, compressing black mix in the form of a
bobbin round a central carbon rod, wrapping the bobbin
in cloth, cleaning zinc can and putting bottom washer,
pouring the paste electrolyte into the can, inserting bobbin
into the can before the paste electrolyte becomes immobile,
putting top washer and capping and sealing, inserting the
cell into a carbon and packing, characterised in that the
salts of aromatic hydroxy acid and alkalies either individually
or in combination are added to the paste electrolyte to
immobilise the same in cold.

Dry cells made in the conventional manner use cooking
as one of the unit operations for immobilising paste electro-

lyte. This operation becomes production rate controlling
factor both for actual cooking process and cooling of the
cell thereafter before sealing.

This, however, has been overcome by the use of novel
method described in this invention which consists of a
process of adding 7-10% w/v of sodium salicylate and salts
of alkali metal group such as lithium, sodium, potassium
rubidium and caesium to the extent of 0.001 to 1% to the
paste electrolyte, the composition of the paste electrolyte
being the same as in Indian Patent No. 103216, containing
ammonium chloride, zinc chloride water, starch, carboxy-
methyl cellulose, flour, mercuric chloride. The paste
electrolyte gets immobilised within 2 to 5 minutes and the
cell can be immediately sealed.

The cells made by the use of the new method outlined
above on continuous discharge through 4.5 ohms show 1 volt
after 3 hours and 0.75 V after 6 hours like the cells made in
the conventional manner,

The present invention consists of a process of making
dry cells without cooking operation in manner stated earlier.
The cells made by the cold setting or immobilising the paste
in cold give the same performance as those made in the
conventional manner by cooking the paste electrolyte for
making it immobile.

The cells on continuous discharge through 4.5 Ohms
give the same performance : i.e. 1 volt after 3 hours and

Price : TWO RUPEES.

0.75 volt after hours as the cells made in the conventional manner by cooking.

This invention eliminates the unit operation of cooking.

It helps to reduce overall cost of production for a dry cell manufacturing company.

A process has been invented to make dry cells which help the industry to increase the production output by eliminating the process of cooking to immobilise the paste electrolyte and to wait for a day to cool the cell before sealing. In the invented process the immobilising of the paste electrolyte has been achieved in cold by the addition of agents such as alkali salts of hydroxy benzoic acids together with salts of alkali metal group. The addition facilitates the immobilisation in cold thereby reducing heating cost and also reducing the time lag introduced by cooling operation in the conventional method. These two changes help in overall reduction in the cost of production of the cell without in any way affecting the performance characteristics.

We claim :

1. A process for making dry cell without cooking operations comprising mixing the ingredients of black mix, compressing black mix in form of bobbin round a central carbon rod, wrapping the bobbin in cloth, cleaning zinc can and putting bottom washer, pouring

the paste electrolyte into the can, inserting bobbin into the can before the paste becomes immobile, putting top washer and capping and sealing, inserting the cell into a carton and packing, characterised in that the salts of aromatic hydroxy acid and alkalies either individually or in combination are added to the paste of electrolyte to immobilise the same in cold.

2. A process as claimed in claim 1 wherein the electrolyte paste contains zinc chloride, ammonium chloride, mercuric chloride, starch, carboxy methyl cellulose, water, in proportion as patented in Indian Patent No. 103216, and having salts of aromatic hydroxy acid such as sodium salicylate 7 to 10% w/v and alkali metal salts such as lithium, sodium, potassium, rubidium, caesium, 0.001 to 1% as addition agents.
3. A process for making dry cells substantially as herein described.

Dated this 21st day of May 1971.

Sd.

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