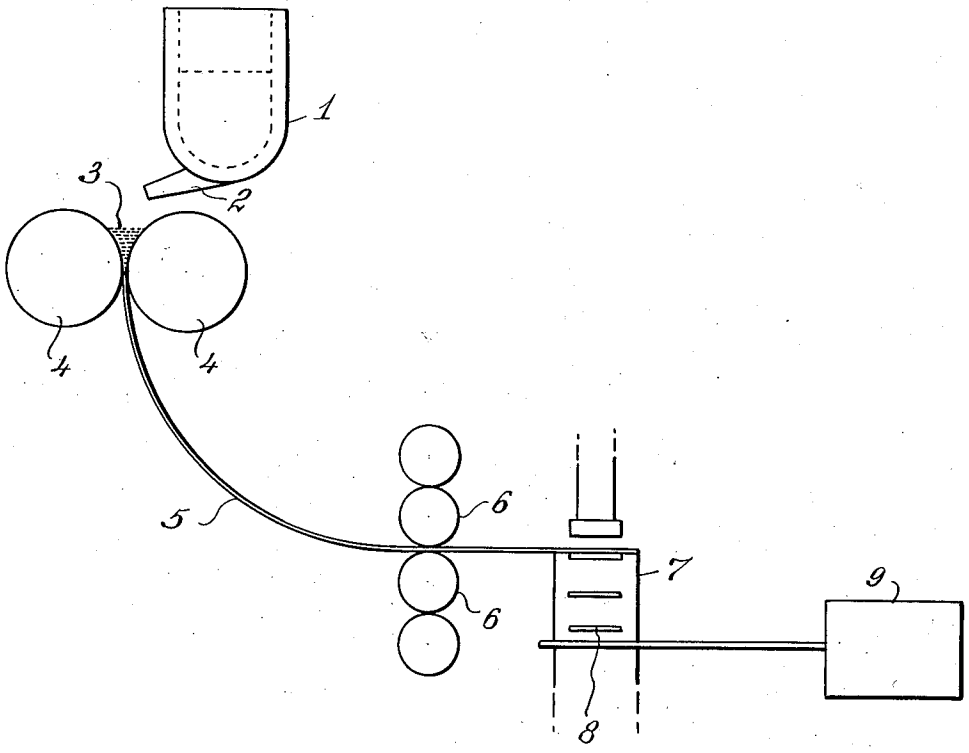
March 4, 1941. T. I. S. BOAK 2,233,578

METHOD OF MAKING BATTERY CANS

Filed Nov. 4, 1937



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Patented Mar. 4, 1941 2,233,578

UNITED STATES PATENT OFFICE

2,233,578

METHOD OF MAKING BATTERY CANS

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Application November 4, 1937, Serial No. 172,731

2 Claims. (Cl. 136—126)

This invention relates to extruded dry cell cans and to a method of making the same.

The zinc cans which form one electrode of a dry cell may be made by several different methods. One method of making such cans is by an extrusion process, blanks being extruded under heat to form the can. Zinc made by the usual rolling mill process is suitable for use in the manufacture of such cans. It is desirable that the zinc of the can be of fine grain size to produce a cell that will be efficient electrically and have a long life.

It has been proposed to produce sheet metal directly from molten metal by means of a pair of horizontally arranged rotating rolls such as is disclosed for example in British Patent 421,539. While zinc so produced is not of the required fine grain size it can be used for making dry cell cans by other processes such as rerolling but it is not capable of being used for the production of high grade cans by the extrusion process. I have found that when zinc so produced is submitted to the extrusion process at the temperature required, that the grain size increases and the resulting can contains zinc of such a large grain size that it is subject to local corrosion and pitting and thus produces a short lived cell which is not satisfactory.

I have also found that the addition of certain elements to the molten zinc from which the sheet zinc is to be made by the process described above prevents the formation of large grain size and produces an electrode can having the fine grain size of zinc produced by the rolling process. The elements which I propose to employ for this purpose are manganese, magnesium and aluminum. The addition of a small quantity of one of these elements to the zinc from which the sheets are made is sufficient. I preferably employ less than .25 percent of the alloying element and best results are obtained when I employ from .05 to .10 percent of manganese, magnesium or aluminum in the zinc from which the cell cans are made.

In the accompanying drawing I have diagrammatically illustrated the manufacture of sheet zinc by the process described in British Patent No. 421,539 and the subsequent steps of blanking and extruding the zinc to form a cell can.

Referring to the drawing, the reference numeral 1 designates an electric furnace or other suitable apparatus for heating zinc or other metal to a molten state. The furnace is provided with a suitable outlet 2 which may be controlled in any suitable manner to deposit a pool 3 of molten zinc between rolls 4. These rolls are spaced from each other and are suitably driven and controlled as to temperature so that the molten zinc as it passes through the rolls will solidify and form a sheet or strip 5. In well established mills the strip may be passed directly to the blanking press 7 whereby blanks 8 of a suitable size for use in the extrusion press for the manufacture of zinc electrodes for dry cells are made. In mills not so well established it may be necessary to pass the strip through suitable sized rolls 6 prior to the blanking press 7. The blanks are then fed to an extrusion press 9 by any suitable means. In this press these blanks are shaped into electrodes or cans for dry cells. The extrusion step requires heat and I preferably carry out this step in the heat of the extrusion from 400° F. to 650° F.

As stated, I have found that electrode cans may be made of zinc that is produced by the process of forming sheet metal directly from molten metal provided a small quantity of manganese, magnesium or aluminum is added to the zinc. The alloy may be made in the customary manner. For example, the manganese or other alloying metal, may be added to the molten zinc in the pouring furnace, or so-called "temper metal" may be added in the required amount to give the desired proportions of manganese or other metal to that of zinc. By "temper metal" is meant a zinc alloy containing a known rich proportion of manganese or other alloying metal which when added to the molten zinc, also of know quantity, gives the proportions desired in the resulting alloy.

In operating this process, molten metal of the desired mixture is fed from the furnace 1 to the rolls 4 so as to maintain a pool 3 between the rolls. The strip zinc 5 so produced has the property of being capable of being extruded under heat without increase in grain size. I may employ as much as .25 percent of manganese, magnesium or aluminum, but as stated, I find that the best results are obtained when the alloying element is present in the proportions of from .05 to .10 percent.

I am aware of prior proposals of alloying zinc with one of many metals including manganese for the purpose of producing metal foil. In the prior practice the alloying metal is used for the purpose of preventing recrystallization of the zinc and producing a product which will have a bright surface. Such process includes the use of substantially pure zinc. In practicing the process of the present invention I employ com-

mercial zinc, such as is used in the manufacture of drawn cans or soldered cans. The zinc employed in the manufacture of drawn cans is generally about 99.84 percent zinc and contains lead, iron and cadmium as impurities. The zinc employed in the manufacture of soldered cans may be from 99.3 to 99.6 percent zinc and contains lead and cadmium as impurities. Either of these forms of zinc may be employed in manufacturing electrode cans according to the present process and the presence of such impurities, or their amounts, within reasonable limits has no material effect on the product produced. The alloying metal is, as stated, added for the purpose of preventing the production of a product of large grain size when the zinc is extruded under heat.

I claim:

1. The method of making electrode cans for dry cells which comprises reducing an alloy containing not more than .25 percent of a metal from the group consisting of manganese, magnesium and aluminum, balance zinc, to a molten state, depositing the molten metal in a pool between a pair of rolls, passing the molten metal through the rolls to solidify it and form a sheet, cutting the sheet into blanks and extruding the blanks to form cans.

2. The method of making electrode cans for dry cells which comprises reducing an alloy of not more than .25 percent of manganese, balance zinc, to a molten state, depositing the molten metal in a pool between a pair of rolls, passing the molten metal through the rolls to solidify it and form a sheet, cutting the sheet into blanks and extruding the blanks to form cans.

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