Jan. 26, 1926. 1,570,916

H. DE OLANETA

APPARATUS FOR INTRODUCING PASTE INTO DRY CELL CUPS

Filed June 9, 1920

Fig. 1.

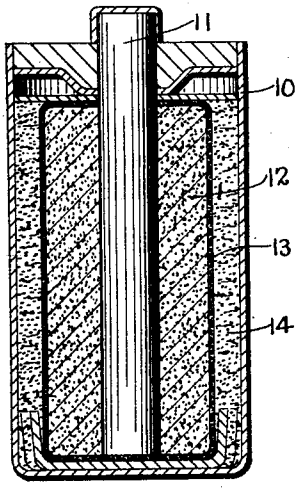


Fig. 2.

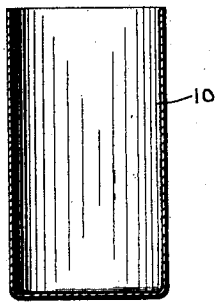


Fig. 5.

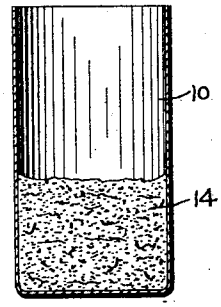


Fig. 3.

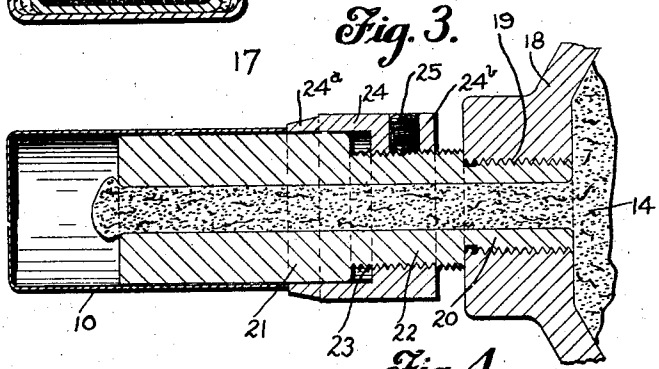


Fig. 4.

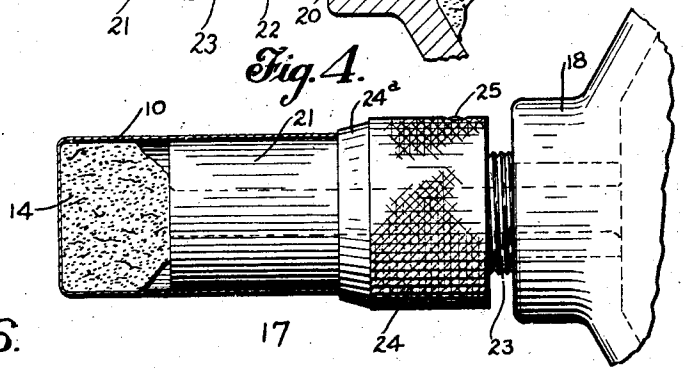
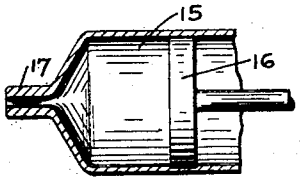


Fig. 6.



Inventor

Harold de Olaneta.

By

Attorney

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UNITED STATES PATENT OFFICE.

HAROLD DE OLANETA, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO WINCHESTER REPEATING ARMS COMPANY, OF NEW HAVEN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

APPARATUS FOR INTRODUCING PASTE INTO DRY-CELL CUPS.

Application filed June 9, 1920. Serial No. 387,674.

To all whom it may concern:

Be it known that I, HAROLD DE OLANETA, a citizen of the United States, residing in New Haven, New Haven County, Connecticut, have invented certain new and useful Improvements in Apparatus for Introducing Paste into Dry-Cell Cups, of which the following is a full, clear, and exact description.

In a companion application, Serial No. 387,675, filed June 9, 1920, I have described and claimed an improved method of introducing semi-liquid or pasty substances into containers. The present invention has particular reference to the apparatus disclosed in that application, which is of peculiar advantage in the manufacture of dry cells of that kind in which a zinc cup contains a body of rather thick paste, into which a depolarizing cartridge is squeezed in the assembling of the cell, the paste being initially located in the bottom of the cup, but being subsequently displaced by pressure to form a layer surrounding the cartridge at the side. The invention provides improved apparatus for injecting an accurately measured quantity of paste into the bottom of the cup, for the purpose mentioned, but it is obviously not limited to this particular application.

One of the primary objects of the invention is the provision of apparatus whereby the cup may be readily and expeditiously filled to the required extent with the paste or similar material.

Another object is to furnish a device whereby the operation may be carried out with cleanliness and neatness.

Another object is to provide a filling device whereby an indication is obtained when the required amount of material has been injected into the cup so that the cup and filling nozzle may then be separated and another cup placed in position for filling.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawing:

Fig. 1 is a vertical central section of a dry cell, in the manufacture of which my improved method may be employed to advantage;

Fig. 2 is a section, on a smaller scale, of the zinc cup;

Figs. 3 and 4 are sectional views of the cup and a portion of the filling apparatus, showing different stages;

Fig. 5 is a section of the cup as it appears after having been partly filled with paste and removed from the nozzle of the filling apparatus; and

Fig. 6 is a diagrammatic sectional view on a small scale of the filling apparatus.

In the cell shown in Fig. 1, 10 is the zinc cup containing the customary carbon pencil 11, which carries a cartridge 12 of suitable depolarizing material. This cartridge is usually covered by a porous envelope 13 of cheese cloth or the like. Between the side surface of the cartridge and the side wall of the zinc cup is the paste 14, which serves as a carrier or vehicle for the electrolyte during the operation of the cell.

I prefer to use a paste which is quite thick. The ammonium chlorid used in the cell may in some instances be all placed initially in the depolarizing mix; and all of the zinc chlorid solution employed in the cell may be placed initially in the paste, as set forth in my application Serial No. 378,458. In this case the paste will be made, for example, by mixing together wheat flour, or some other cereal, with zinc chlorid solution (which serves to keep the paste moist) and a mercuric compound, which acts as an amalgamator for the zinc. For instance, in making up a batch of paste for the manufacture of a number of cells, I may mix together 12.5 kilograms of wheat flour, 50 litres of zinc chlorid solution at 27° Baumé, and 12.5 grams of mercuric chlorid. These ingredients are mixed together until all of the flour is dissolved and the mass is stirred while being cooked until a stiff paste is formed. The paste may obviously be made in other ways so far as the present invention is concerned, but as stated, it will preferably be a thick, precooked paste, because I find that such a paste gives very good results.

In assembling the cell a quantity of the paste is introduced into the bottom of the zinc cup 10, as shown in Fig. 5, and the cartridge 12, carrying the carbon electrode 11, is then squeezed into the paste within the cup in such a manner as to cause the paste to be flowed into the location shown in Fig. 1, wherein it surrounds the cartridge at the side. The particular way in which

this is done, however, is not material, as the present invention is especially concerned with the means for transferring a measured quantity of paste from a large container into the bottom of the cup, as shown for example in Fig. 5.

In carrying out the invention I prefer to employ a filling apparatus, generally similar to that shown diagrammatically in Fig. 6. In this view, 15 is a pump cylinder, into which the paste is introduced in any suitable manner, and 16 is a plunger or follower, which is used for forcing the paste out of a discharge nozzle 17 into the battery cup. The body of paste being located in front of the plunger, the latter can be given a forward movement in the cylinder by any appropriate mechanism, with which the present invention is not concerned, the result being that the paste is forced out of the nozzle 17 and into the cup which is placed against the nozzle for filling. Fig. 6 does not show the detail construction of the nozzle, but Figs. 3 and 4 show in detail a form of nozzle which may be employed advantageously. In these views the forward extremity 18 of the pump cylinder is provided with a threaded socket 19, into which is screwed the reduced end 20 of a nozzle section 21. The main part of the nozzle section 21 is cylindrical, of a diameter only slightly less than the inside diameter of the cup of the dry cell. Between the main part of the nozzle section and the reduced extremity 20 is a portion 22 of intermediate size, having exterior screw threads 23 engaged by interior screw threads of an adjustable sleeve 24. The sleeve 24 has a body portion 24^a of an interior diameter corresponding to the exterior diameter of the nozzle section 21 and said portion 24^a is located at the front of the sleeve and slides on the rear portion of the smooth cylindrical part of the nozzle section 21. At its rear end the sleeve has a wall 24^b with a perforation therethrough, said perforation being provided with threads to engage the threads 23. A screw 25 engaging a threaded lateral socket in the wall 24^b of the sleeve permits the sleeve to be tightly held in place after being adjusted longitudinally with respect to the nozzle.

The sleeve 24 serves as a stop to limit the extent to which the zinc cup 10 may be thrust over the nozzle section 21. By making the sleeve adjustable lengthwise of the nozzle the amount of paste introduced into the cup may be regulated, as hereinafter described. In order to adjust the sleeve the screw 25 is released and then the sleeve is turned in one or the other direction in order to increase or decrease the distance between the front edge of the sleeve and the front end of the nozzle, as may be described. The front edge of the sleeve serves as a stop for the cup, against which the mouth portion of the cup bears, the sleeve being of approximately the same diameter as the cup. For convenience in operation the exterior surface of the sleeve may be knurled, if desired, so that the sleeve may be turned by the fingers of the operator.

The front end portion of the nozzle section 21 is cylindrical in shape, preferably with a flat forward face. When the cup is thrust over the nozzle, as shown in Fig. 3, the forward face of the nozzle defines the space in the cup which is to be filled with paste. By adjustment of the sleeve 24 the space to be filled may be increased or decreased, as will be obvious. It is important to note that while the nozzle section 21 almost fills the mouth portion of the cup and all that part lying in front of the space to be filled, it does not completely shut off the bottom part of the cup from the atmosphere. In order that the cup may be properly filled it is necessary that the bottom space be vented of air and this is provided for by my invention, inasmuch as an air space is left for venting of the air in the bottom portion of the cup as the paste is introduced. In the particular form shown the air vent is at the periphery of the nozzle section 21, the diameter of said nozzle section being so much less than the interior diameter of the cup as to permit the air to pass out of the cup and prevent it from being occluded therein. On the other hand, however, the air venting space, which lies between the outer surface of the nozzle section and the inner surface of the cup wall, is not sufficiently large to permit the outward passage of any appreciable amount of paste into this space from the bottom of the cup under a normal operating pressure.

The operation of the apparatus is as follows: The pump casing having been filled with paste in front of the plunger 16 and the cup having been thrust over the nozzle section 21, as far as this is permitted by the adjustable stop 24, pressure is exerted on the plunger for forcing the paste out of the nozzle into the bottom of the cup. The space which will be filled can be accurately determined by adjustment of the stop, as previously explained. The paste, as previously stated, is of a thick consistency, similar to that of shaving cream sold in collapsible tubes, and if no pressure is exerted on the plunger 16 the paste will not be forced out of the nozzle. When pressure is exerted on the plunger, however, the paste is ejected from the end of the nozzle in a sort of mushroom formation, as shown in Fig. 3, and as the forcing action is continued the size of the mushroom head increases until the paste strikes the bottom of the

cup. While this is going on the air in the bottom portion of the cup is forced out over the cylindrical outer surface of the nozzle in the venting space previously mentioned. There is, of course, leakage between the edge of the cup and the opposing surface of the stop sleeve and this leakage is sufficient to permit the venting of the cup, particularly if the cup is not held against the nozzle by the hand of the operator with any very great pressure. The mushroom head of paste being injected into the cup first strikes the bottom of the cup at the center and then spreads out radially over the bottom and the displacement of air for venting is therefore very direct, as the air is pushed radially and outward to the peripheral venting space between the outer surface of the nozzle and the inner surface of the cup. As the pressure on the plunger is continued the space between the front face of the nozzle and the bottom and side wall of the cup is completely filled.

At the time this space is completely filled an indication of that fact is given by the increased reaction pressure against the hand of the operator. The cup space to be filled is filled first at the bottom and later at the top, remaining throughout the operation in communication with the venting space; but when the paste space is completely filled, increased pressure is caused by the fact that the vent opening is so small as to prevent any appreciable amount of paste from entering the same. In the case illustrated, for example, the vent passage around the outside of the nozzle being very narrow and the paste on the other hand being quite thick, the result is that when the paste space in the bottom of the cup is completely filled the increased pressure caused by the resistance of the paste to passage through the venting space occasions an outward thrust on the cup, which indicates to the operator that the same has been filled to the required extent, and the cup is then removed from the nozzle and another cup placed thereon for filling.

In the foregoing description it has been assumed that the paste pump, the axis of which is preferably horizontally disposed, is fixedly mounted, and that the cup is placed over the filling nozzle by the hand of the operator and then withdrawn after filling. It will be understood, however, that it is not necessary for the filling apparatus to be stationary and the cup movable, so far as certain aspects of the invention are concerned.

Various changes may be made in the details of the apparatus, as herein described, without departing from the scope of the invention as defined in the claims.

What I claim is:

1. An apparatus for dispensing paste into dry cell cups comprising a container having a nozzle through which the paste is discharged, said nozzle being of sufficient length to extend to the bottom portion of the cup and having a relatively small bore and an end surface of substantial area, the exterior diameter of which surface is substantially that of the interior diameter of the cup, whereby the paste discharged into the cup will be confined between the end face of the nozzle and the cup bottom, and means for limiting the insertion of the nozzle within the cup whereby a predetermined quantity of paste may be introduced therein.

2. Means for introducing a predetermined quantity of paste or the like into a dry cell cup, comprising a container having an approximately cylindrical discharge nozzle provided with a flat end face of substantial area and a relatively small bore, the exterior diameter of said end face being substantially that of the interior diameter of the cup, adjustable means for limiting the insertion of the nozzle into the cup whereby the quantity of paste introduced into the cup may be measured by being confined between the bottom of the cup and the end surface of the nozzle, and means for forcing the paste from the container.

In witness whereof, I have hereunto set my hand on the 7th day of June, 1920.

HAROLD DE OLANETA.