H. DE OLANETA.

METHOD OF MAKING PAPER CENTERING CUPS OR THE LIKE.

APPLICATION FILED JUNE 28, 1920.

1,385,431. Patented July 26, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

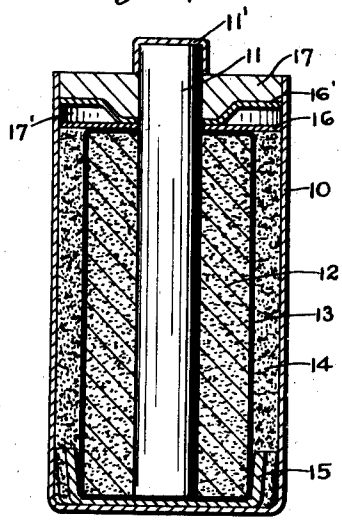



Fig. 3.

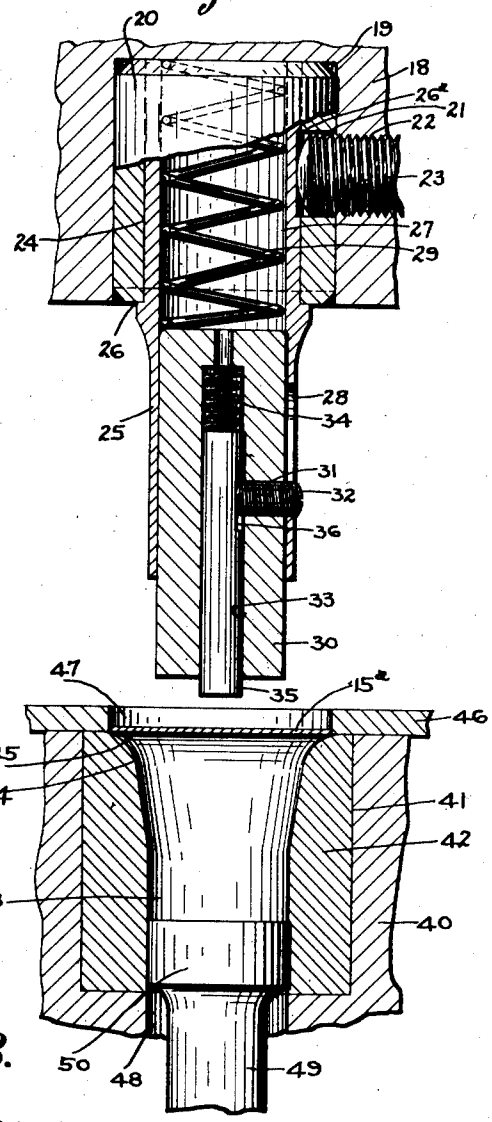



Fig. 2.

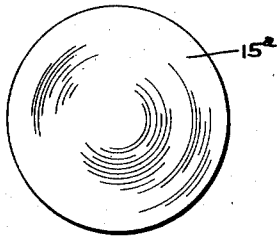



Fig. 6.

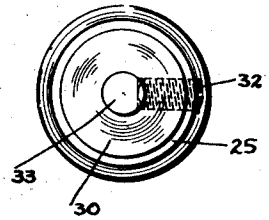
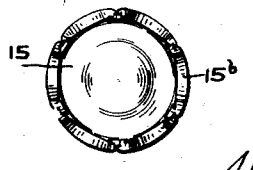



Fig. 8.




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2 SHEETS—SHEET 2.

*Fig. 4.*

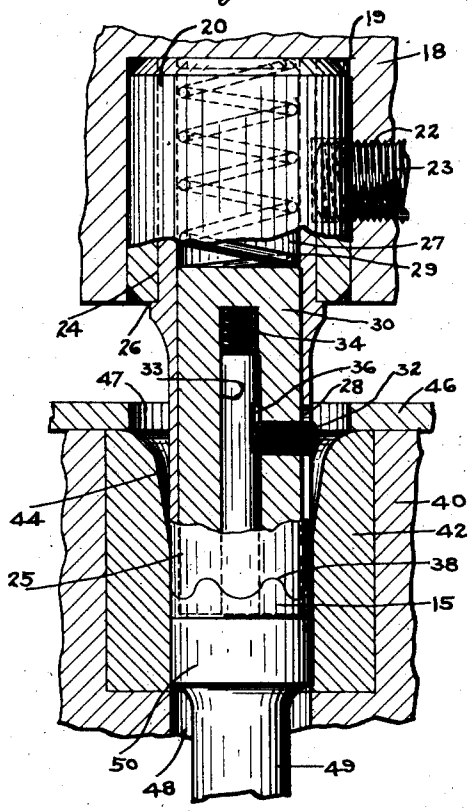



*Fig. 5.*

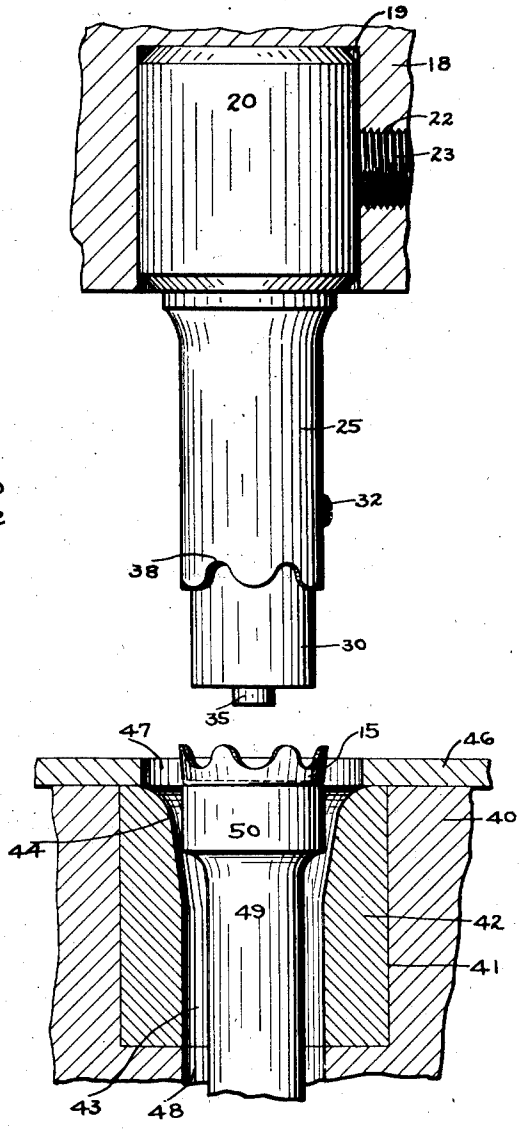
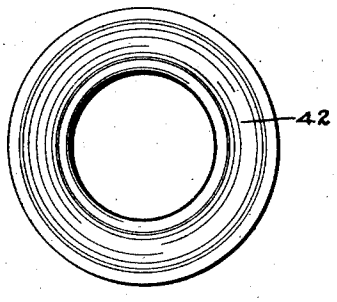



*Fig. 7.*




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# UNITED STATES PATENT OFFICE.

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## METHOD OF MAKING PAPER CENTERING-CUPS OR THE LIKE.

1,385,431. Specification of Letters Patent. Patented July 26, 1921.

Application filed June 28, 1920. Serial No. 392,287.

*To all whom it may concern:*

Be it known that I, HAROLD DE OLANETA, a citizen of the United States, and a resident of New Haven, county of New Haven, State of Connecticut, have invented certain new and useful Improvements in Methods of Making Paper Centering-Cups or the like, of which the following is a full, clear, and exact description.

This invention relates to the manufacture of paper cups, and more particularly to that type of these articles used in making dry cells, although the invention is not necessarily limited in this respect as it may be followed in making similar cups, capable of various purposes and uses.

One of the primary objects of this invention is to provide a simple, expedient, and economical method of making the cups from paper blanks.

A further object of the invention is to provide an improved method of treatment of the blank from which the cup is made so that it may be more easily formed and given the required shape.

A still further object of the invention is to provide an improved method of manufacture of paper cups of this type, which may be performed by suitable machines, and thus enable the cups to be made in large quantities with a minimum expenditure of labor.

To these and other ends, the invention consists in the novel features and steps and procedure to be hereinafter described and claimed.

In the accompanying drawings:

Figure 1 is a central sectional view of a dry cell, showing a paper centering cup in its operative position.

Fig. 2 is a view of the paper blank or disk from which the cup is made.

Fig. 3 is a sectional view of the punch and die used in the manufacture of the cup, showing the position of the blank, and other parts at the beginning of the downward stroke of the press.

Fig. 4 is a view similar to Fig. 3, showing the position of the parts at the end of the downward stroke of the punch.

Fig. 5 is a view similar to Figs. 3 and 4, showing the position of the ports at the completion of the upward stroke of the punch.

Fig. 6 is a bottom plan view of the punch.

Fig. 7 is a top plan view of the die.

Fig. 8 is a top plan view of the completed cup.

In the dry cell shown in Fig. 1 of the drawings, the zinc cup 10, constituting one electrode, contains a carbon pencil 11, which serves as the other electrode. The carbon electrode is embedded in and surrounded by a depolarizing cartridge 12, consisting of a suitable powdery or granular depolarizing material tamped about the carbon in order to form a block or cartridge adhering to the same. The cartridge is preferably inclosed in a paper envelop, such as a bag 13, of cheese cloth or the like. Between the side surface of the cartridge and the inner surface of the side wall of the zinc cup is a suitable electrolytic paste 14. In the bottom of the zinc cup is the paper centering cup or disk 15 which will be dealt with more particularly hereinafter.

Overlying the cartridge 12 and abutting the upper surface thereof, is a washer 16 of paraffined paper or the like, having an opening whereby it is fitted about the carbon electrode. Above the washer 16, is a second washer 16′, which may be of the same material, and which is of cupped form having a downwardly projecting central portion to provide a gas chamber 17′ between the two washers and a deep pocket near the electrode for a sealing material 17. The top of the carbon electrode is provided with a contact cap 11′ usually of brass.

The cup 15 which is used to center the cartridge 12 in the zinc cup is made from a paper blank of disk shape as shown in Fig. 2. This paper blank is treated with paraffin before the cup is formed. The blank is, in practice, cut from strips of paper and the paper may have been impregnated with paraffin before this cutting process or the blanks may first be cut from the untreated paper, and impregnated when in disk form.

While the steps and procedure included in my invention may be performed by various means, I have shown, for this purpose, a preferred embodiment of one form of machine which carries out my method expeditiously and efficiently. It consists, in the

form shown, of a press having a movable punch and a coöperating die in which the cup is formed by pressure.

The press is provided with a gate or movable part 18 in which is provided a suitable socket 19 which receives a punch collar 20. This collar is in the form of a cylindrical sleeve, and is provided with an opening 21, extending through the same, which, when the collar is inserted in the socket 19 may be placed in alinement with a threaded screw hole 22 in the gate, and the punch collar may thus be locked in position by a set screw 23 being inserted in the hole 22 to a sufficient extent to engage the collar. As stated above, this collar is in the form of a sleeve, and is provided with a central bore or socket 24 for the reception of the upper end of an outside punch 25. This punch is generally of a cylindrical shape and is provided with an annular shoulder 26, which is adapted to abut against the lower end of the punch collar 20 when the punch is in position. The upper end of the punch is provided with a recess $26^a$, which is adapted to be placed in alinement with the opening 21 that the set screw 23 may be inserted through the opening 21, until its end will engage in the recess $26^a$, to hold the punch in position in the collar. The punch is also provided with an interior bore or opening 27 extending entirely through the punch. Extending through the wall, near the lower end thereof, is provided a slot or opening 28, of oblong shape. The lower edge of this outside punch is provided with scallops or indentations 38 for a purpose to be hereinafter explained. In the upper end of the bore 27 is a resilient member which in the embodiment shown takes the form of a coil spring 29.

Within the bore 27 and below the spring 28, is inserted an inside punch 30, which snugly fits within the bore and is provided with an opening 31 for the reception of a set screw 32, the outer end of which is adapted to rest in the slot or opening 28 in the inside punch 25, and in this way serves to limit the relative movement of the two punches. It will be seen that the coil spring 29 will serve to normally keep the punch in its lower position so that the screw 32 will normally rest in the lower end of the slot 28. This inside punch is in turn provided with an interior opening 33, extending nearly throughout the entire length thereof, and within this opening, at the upper end thereof, is a second resilient member or coil spring 34, bearing at its upper end against the top of the opening 33 and its lower end against a stripper punch 35, which snugly fits within the opening 33. This stripper punch is provided on the side adjacent the screw 32 with a recess 36, and the set screw 32 is adapted to be inserted through the opening 31 so that it will project into the recess 36 and thus limit the movement of the stripper punch, relative to the inside punch. The recess 36 is, as shown, of greater length than the diameter of the screw 32 so as to permit some relative movement between these two punches. It will be apparent from the structure of the parts just described, that if the press gate is now brought down against a flat surface, the stripper punch will be forced up against the tension of its spring 34, until the lower end is flush with the lower end of the inside punch 30. If the downward movement of the press gate is continued, the inside punch will now be moved relatively to the outside punch against the tension of the spring 29, the screw 32 moving upwardly in the slot 28.

Below the gate and punches just described, is a die block 40 provided with a socket 41 for the reception of a die 42. This die is provided with a forming bore, located centrally relatively to the die, which at its lower end is cylindrical in shape as shown at 43, the diameter being equal to that of the formed cup 15. Above this cylindrical portion this bore is formed with a gradually increasing sectional area until a point 44 is reached, near the upper surface of the die, where it flares abruptly as shown at 45, so that at the upper surface of the die there is provided an opening, the diameter of which is substantially equal to the diameter of the disk blank $15^a$. On the die block rests a dial, a portion of which is shown at 46, provided with openings to receive the disk blanks $15^a$, one of which openings is shown at 47.

Below, and in alinement with the cylindrical portion 43 of the forming bore, the die block is provided with an opening 48, through which is adapted to extend a bottom punch 49, having an enlarged head portion 50 which snugly fits the bore 43, and provides a convenient and satisfactory means for removing the formed cup from the die. As shown in Fig. 5, this bottom punch carries the completed cup up level with the surface of the die block where it may be conveniently removed by the rotation of the dial or in any other desired manner.

It has already been stated that the disks $15^a$ may be cut from strips of paper impregnated with paraffin or the disks may first be blanked out and subsequently treated with the paraffin. This paraffin treated disk is subjected to heat to soften the paraffin to some extent, thus rendering the blank pliable so that it may be more easily folded and formed into the desired shape. The heating of the disks may be accomplished in a variety of ways, one of which is to place the disks on a metal surface heated by an electric coil. The disk is allowed to remain in

contact with this heating surface for a short time and it is then sufficiently pliable to be shaped into the cup.

If the cup is to be made by machinery in large quantities, provision may be made for causing these disks, in their travel to the forming die, to be passed over a heating coil as described, remaining in contact therewith long enough to give them the desired pliability. I have shown such an arrangement incorporated in a machine for manufacturing these cups in my co-pending application, Serial No. 392,286, filed June 28, 1920. After passing through the heating process, the disk is carried in one of the openings 47 of the dial, above the die forming bore. The dial may be brought into alinement with the bore before the disk is inserted, or, if desired, the disk may be inserted in the dial and the dial thereafter moved over the bore. The gate of the press is then brought down and the blank forced down into the forming bore, the edge of the disk being cupped up and crimped or folded around the inside punch 30, which maintains a uniform inner diameter for the cup of a size to receive the cartridge 12.

When the stripper punch strikes the blank $15^a$, it is forced upwardly relative to the inside punch against the tension of the spring 34 until its lower end is flush with the lower face of the inside punch. As the stroke continues and increased pressure is brought upon the lower face of the inside punch it is retracted to some extent within the outside punch against the tension of the spring 29 as shown by a comparison between Fig. 4 and Fig. 3 and Fig. 5. This allows the scalloped lower edge of the outside punch to be brought down on the upper cupped edge of the blank, which is held, against lateral displacement, between the inside punch and the cylindrical forming bore 43, and to form cut out portions, indentations or scallops $15^b$, on this edge of the cup. As shown in Fig. 4, the projecting portions of the edge of the outside punch crush downwardly the opposing portions of the upper cupped edge of the blank, and thus form the indentations or scallops.

On the upward movement of the gate and punches, the springs 29 and 34, urge the inside and stripper punches outwardly to their normal positions, the stripper punch stripping the formed cup from the inside punch, to which it would otherwise be held by friction, the cup dropping on the bottom punch and thereby being carried upward to the surface of the die where it may be conveniently removed for the insertion of a new blank.

As the cup reaches the upper enlarged portion of the die forming bore, the cupped sides will flare slightly from the closely folded or crimped position at the bottom of the bore, due to the release of pressure thereon, thus enabling the cup to be slipped over the end of the cartridge with facility. The scallops or indentations are as shown, formed quite deeply in the edges of the cup so that the upturned cup walls or edges will interfere as little as possible with the action of the electrolyte, while at the same time, presenting a sufficient centering area.

The crushing of the walls to provide the indentations renders these portions of the wall quite thick so that while a comparatively large space may be left for the electrolyte between the cartridge and the zinc cup, yet the thickened portions of the cup will fit snugly in this space and firmly center the cartridge.

I have found the herein described preferred way of performing my method, an expeditious and exceedingly convenient manner of manufacturing these centering cups or the like. It will be understood that my invention is not limited to the exact features or procedure described, but is capable of many variations and modifications which lie within the spirit of the invention and in the scope of the appended claims.

While I have illustrated and described in particularity the manufacture of a paper centering cup for dry cells, it is to be understood that the method which is the subject of my invention may be followed in the manufacture of many similar articles, made of other materials, and designed for use in other relations.

I make no claim in this application to the construction of the dry cell as this forms the subject matter of my copending application Serial No. 368,324 filed March 24, 1920, nor do I claim the centering cup as an article of manufacture as claimed in my copending application Serial No. 379,515 filed May 7, 1920, nor do I claim the apparatus, shown herein, for carrying out my improved method for the same forms the subject matter of my copending application Serial No. 392,286, filed June 28, 1920.

What I claim is:

1. The method of making centering cups for dry cells, or the like, from fibrous material which includes shaping the upturned edge of the cup to form indentations or scallops therein.

2. The method of making paper cups, or the like, which includes shaping by pressure the upturned edge of the cup to form indentations or scallops therein.

3. The method of making centering cups for dry cells, or the like, which includes shaping the upturned edge of the cup to form indentations or scallops therein by crushing said edge.

4. The method of making centering cups for dry cells, or the like from a blank disk of fibrous material, which includes shaping

the peripheral edge thereof to form scallops or indentations therein.

5. The method of making paper cups, or the like from a blank disk, which includes shaping by pressure the peripheral edge thereof to form scallops or indentations therein.

6. The method of making a cup shaped body from a blank of fibrous sheet material which comprises heating to blank to render the same pliable during the cupping operation and thereafter cupping the same.

7. The method of making centering cups for dry cells, or the like, which comprises cupping a suitable blank and shaping the turned edge of said cupped portion to form scallops or indentations therein.

8. The method of making paper cups, or the like, which comprises cupping a suitable blank and shaping the turned edge of said cupped portion by pressure to form scallops or indentations therein.

9. The method of forming a cup shaped body from a blank of fibrous sheet material, which comprises cupping a suitable blank and shaping the turned edge of said cupped portion by crushing said edge to form scallops or indentations therein.

10. The method of making centering cups for dry cells, or the like, which comprises cupping by pressure a suitable blank, and shaping the turned edge of said cupped portion to form scallops or indentations therein.

11. The method of making paper cups, or the like, which comprises cupping by pressure a suitable blank, and shaping the turned edge of said cupped portion by pressure to form scallops or indentations therein.

12. The method of forming a cup shaped body from a blank of fibrous sheet material, which comprises cupping by pressure a suitable blank and shaping the turned edge of said cupped portion by crushing the edge to form scallops or indentations therein.

13. The method of making centering cups for dry cells, or the like, which comprises cupping a suitable blank, and substantially simultaneously shaping the turned edge of said cupped portion to form scallops or indentations therein.

14. The method of making paper cups, or the like, which comprises cupping a suitable blank, and substantially simultaneously shaping the turned edge of said cupped portion by pressure to form scallops or indentations therein.

15. The method of forming a cup shaped body from a blank of fibrous sheet material, which comprises cupping a suitable blank, and substantially simultaneously shaping the turned edge of said cupped portion by crushing said edge to form scallops or indentations therein.

16. The method of making centering cups for dry cells, or the like, which comprises cupping by pressure a suitable blank, and substantially simultaneously shaping the turned edge of said cupped portion to form scallops or indentations therein.

17. The method of making paper cups, or the like, which comprises cupping by pressure a suitable blank, and substantially simultaneously shaping the turned edge of said cupped portion by pressure to form scallops or indentations therein.

18. The method of forming a cup shaped body from a blank of fibrous sheet material, which comprises cupping by pressure a suitable blank, and substantially simultaneously shaping the turned edge of said cupped portion by crushing said edge to form scallops or indentations therein.

19. The method of making centering cups for dry cells, or the like, which comprises cupping a suitable blank, holding the cupped edge against lateral displacement, and shaping said edge to provide scallops or indentations therein.

20. The method of making centering cups for dry cells, or the like, which comprises cupping a suitable blank, holding the cupped edge against lateral displacement, and shaping said edge by pressure to provide scallops or indentations therein.

21. The method of making centering cups for dry cells, or the like, which comprises cupping a suitable blank, holding the cupped edge against lateral displacement, and shaping said edge by crushing the same to provide scallops or indentations therein.

22. The method of cupping a blank of impregnated fibrous material which includes heating the blank to render the same pliable and thereafter cupping the same.

23. The method of making a centering cup, or the like, which comprises coating a suitable blank with a protective covering, subjecting the coated blank to a softening process, and cupping the same.

24. The method of making a centering cup, or the like, which comprises coating a suitable blank with a protective covering, subjecting the coated blank to a softening process, and cupping the blank by pressure.

25. The method of making a centering cup, or the like, which comprises impregnating a suitable blank with paraffin, heating said blank to render same pliable, and thereafter cupping the same by pressure.

26. The method of making a paper centering cup, or the like, which comprises impregnating a suitable blank with paraffin, heating said blank to render the same pliable, and thereafter cupping the same, and simultaneously shaping the edge of said cupped portion to provide scallops or indentations therein.

27. The method of making a centering cup, or the like, which comprises coating a suitable blank with a protective covering,

subjecting the coated blank to a softening process, and cupping the same and simultaneously shaping the turned edge to form scallops or indentations therein.

28. The method of making a centering cup, or the like, which comprises coating a suitable blank with a protective covering, subjecting the coated blank to a softening process, cupping the same by pressure, and shaping the edge of the blank to form indentations therein simultaneously with the cupping process.

29. The method of making a centering cup, or the like, which comprises impregnating the material of which the cup is to be made with a protective filling, subjecting it to a softening process, and shaping the upturned edge thereof to provide indentations therein.

30. The method of making a centering cup for dry cells, or the like, which comprises coating the surface of said cup with a protective covering, subjecting the same to a heating process to render it pliable, and shaping the turned edge to form indentations therein.

31. The method of making a centering cup for dry cells, or the like, which comprises impregnating the walls and bottom of the cup with paraffin, heating the walls of the cup to render them pliable, and shaping the same to form indentations therein.

32. The method of making a centering cup, or the like, which comprises impregnating the material of which the cup is to be made with a protective filling, subjecting it to a softening process, and shaping the upturned edge thereof by crushing said edge to provide indentations therein.

33. The method of making a centering cup for dry cells, or the like, which comprises coating the surface of said cup with a protective covering, subjecting the same to a heating process to render the same pliable, and shaping the turned edge thereof by crushing said edge to form indentations therein.

34. The method of making a centering cup for dry cells, or the like, which comprises impregnating the walls and bottom of the cup with paraffin, heating the walls of the cup to render them pliable, and shaping the edge of the same by crushing it to form indentations therein.

In witness whereof, I have hereunto set my hand, this 25th day of June, 1920.

HAROLD DE OLANETA.