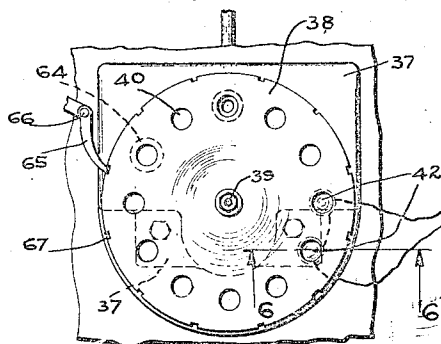
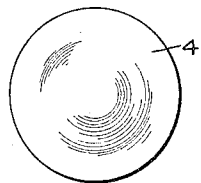
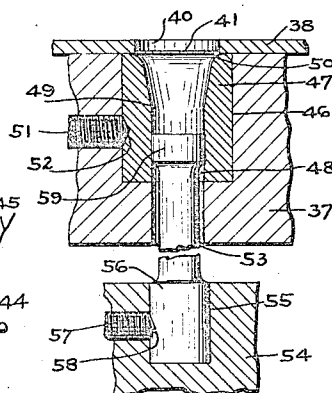
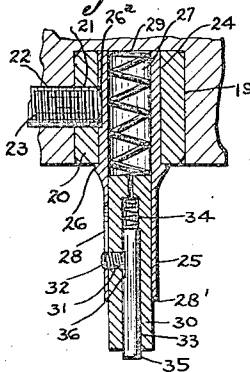
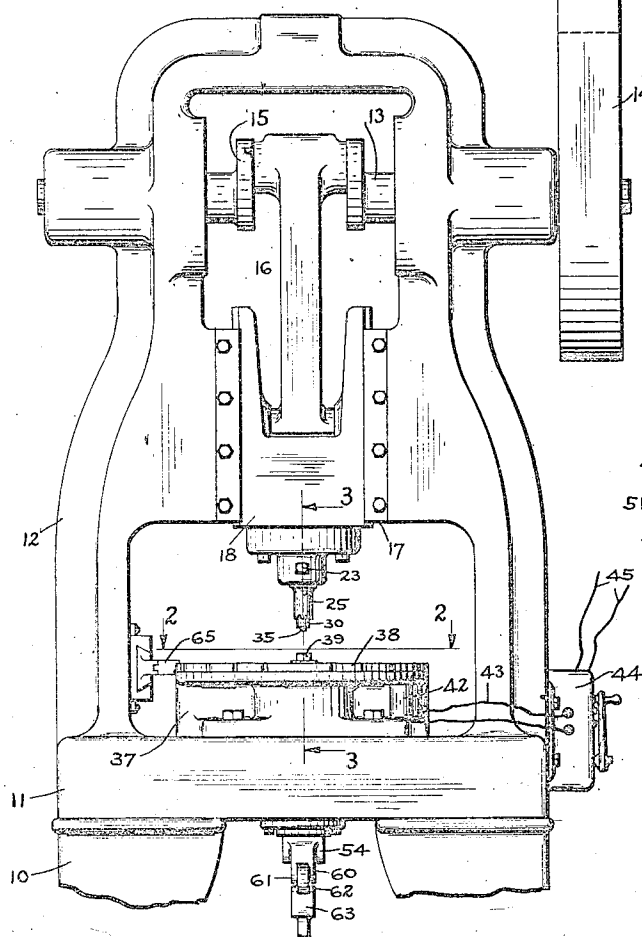


1,402,286.

2 SHEETS—SHEET 1.



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H. DE OLANETA.
MACHINE FOR MAKING PAPER CUPS AND THE LIKE.
APPLICATION FILED JUNE 28, 1920.

1,402,286.

Patented Jan. 3, 1922.

2 SHEETS—SHEET 2.

Fig. 4.

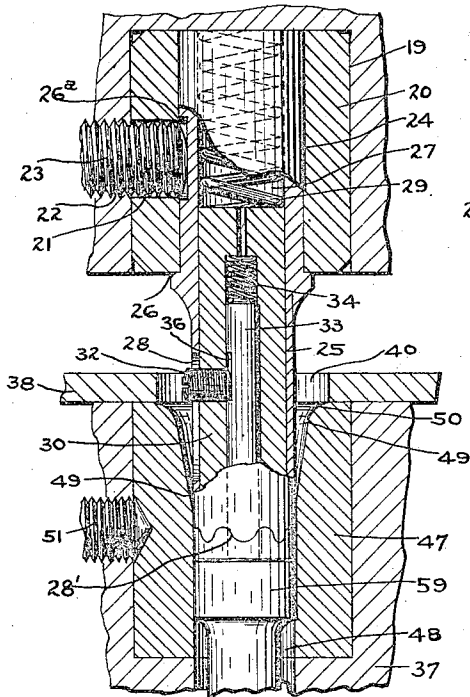


Fig. 5.

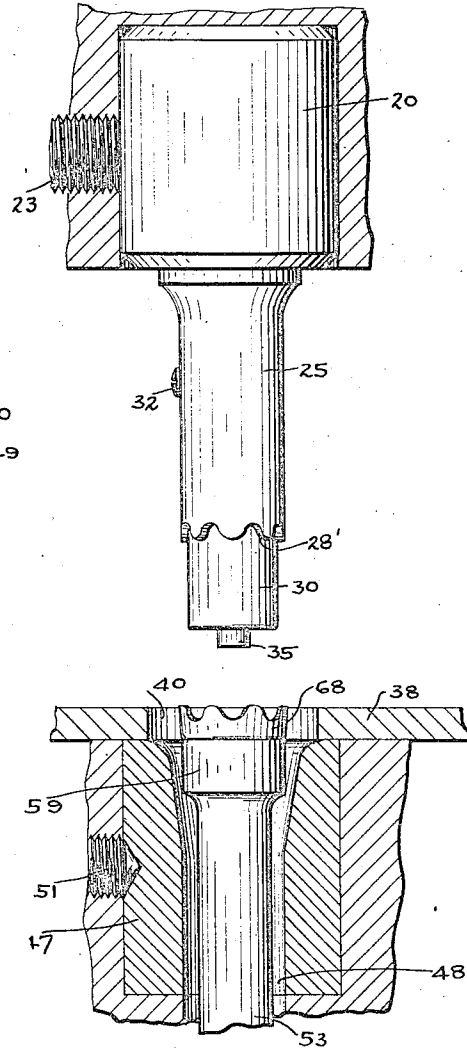
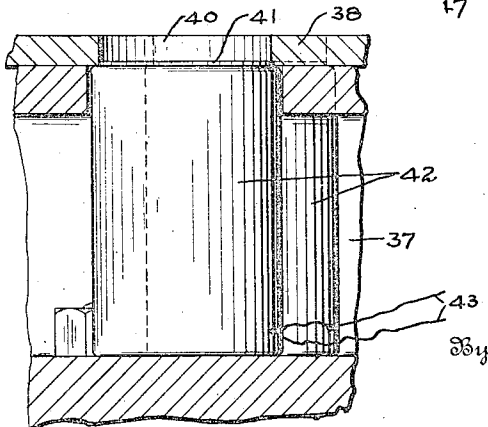


Fig. 6.



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MACHINE FOR MAKING PAPER CUPS AND THE LIKE.

1,402,286.

Specification of Letters Patent.

Patented Jan. 3, 1922.

Application filed June 28, 1920. Serial No. 392,286.

To all whom it may concern:

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

This invention relates to machines for making paper cups, and more particularly to a machine for making paper cups which are designed to be used in the manufacture of dry cells, although the device is not necessarily limited in this respect as the machine shown and described herein may be used in the manufacture of paper cups for any other purpose desired.

In the manufacture of dry cells, it is common to provide a zinc cup or container which serves as one of the electrodes of the cell. The other electrode is usually in the form of a carbon pencil which is surrounded by, and embodied in a depolarizing substance such as manganese dioxide or the like which is packed tightly around the pencil to form a cartridge. This cartridge is centered in the zinc cup or container, and a paste of a suitable electrolytic substance surrounds this cartridge so as to lie between it and the walls of the cup. The cartridge is centered by a paper cup being slipped over the bottom end thereof, and the cup and cartridge then being placed in the zinc container. The paper cup is of a size that it will fit snugly in the zinc container and of a thickness such that it will fit snugly over the bottom of the cartridge. It is with a machine for manufacturing these paper cups that this application is particularly concerned although it will be apparent that the material from which the cups are made or the use to which they are to be put is not a matter of consequence as many features of the invention may be useful in relations other than those described.

One object of this invention is to provide a simple and efficient machine for manufacturing these paper cups.

Another object of the invention is to provide a machine to which a blank in the form of a disc may be supplied and the formed cup manufactured from the blank by the automatic operation of the machine.

A further object of the invention is to

provide a machine of this character, which will have means for heating the blank in its passage through the machine so as to render its forming or shaping into the cup form less difficult.

A still further object of the invention is to provide an improved punch and die for forming the paper cups as described.

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 drawings:

Fig. 1 is a side elevational view of a machine of the character described, which embodies my invention.

Fig. 2 is a top plan view of the dial and bed of the machine looking down on line 2—2 of Figure 1.

Fig. 3 is a detail sectional view on line 3—3 of Figure 1.

Figures 4 and 5 are views similar to Fig. 3, but showing the parts in different positions.

Fig. 6 is a detail view of the means for heating the paper discs.

Fig. 7 is a plan view of the blank from which the cups are made.

Fig. 8 is a perspective view of the completed, formed paper cup.

It will be apparent that it is desirable to provide a machine which will be capable of manufacturing these paper cups from the blanks in the form of discs in large quantities, and one which will accomplish all of the steps of making the disc from the blank as nearly as possible by its own operation without requiring much attention from the operator.

With these and other objects in view, I have shown a machine in the form of a press for this purpose, which is mounted on suitable standards 10, and consists of a supporting bed or plate 11, and an upper frame 12. In the upper part of the frame 12 is journaled a crank shaft 13, one end of which projects without the frame, and a pulley or crank wheel 14 is secured thereon. The intermediate portion of the crank shaft is provided with a cranked portion 15, to which is pivoted a connecting rod 16. Below this crank shaft, the frame is provided with suitable guides 17, for a press gate 18, to which the connecting rod 16 is pivoted in a well known manner.

The press gate 18 is provided with a 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 alignment 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 alignment 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 28' for the 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.

On the bed 11 is mounted a die block 37, which, as shown in Figures 1 and 2, is provided with a plane supporting surface 37' to support a rotating circular dial 38, mounted on a vertical axis 39, about the center of the die block. The dial 38 is provided near its periphery with a plurality of openings 40 which are spaced equidistantly about the circumference of a circle around the axis 39 as a center. These openings are adapted to receive the disc blanks 41, as shown in Fig. 7, and upon the rotation of the dial, these discs will be carried around until they come into position beneath the punches in the gate of the press. Below the supporting surface 37' are mounted two heating coils 42, which, as shown in Figures 1 and 2, are spaced apart a distance equal to the space between two adjacent holes 40 in the dial. These coils are supplied with electric current through the wires 43, the strength of which current is controlled by a rheostat 44 which is supplied through the lead wires 45. The upper surfaces of the coils 42 are, as shown in Fig. 6, positioned substantially flush with the plane supporting surface 37' so that as the discs 41 are carried around by the dial 38, they will in their progress come into contact with the upper surfaces of these heating coils. The die block is provided with a die socket 46 directly under, and in vertical alignment with the punches secured in the gate 18, for the reception of a die 47. This die is provided with a forming bore located centrally, relative to the die, which, at its lower end, is cylindrical in shape as shown at 48, the diameter being equal to that which is desired for the finished cup. Above this cylindrical portion the bore is formed with a gradually increasing sectional area until a point 49 is reached near the upper surface of the die where it flares abruptly as shown at 50 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 disc blank 41. The die 47 is secured in position in the die block 37 by a set screw 51 which passes through the die block and enters the recess 52 in the die. The die block is provided below the socket 46 with an

opening 53 which is in vertical alignment with the forming bore in the die. Below this opening there is mounted in the supporting bed 11 a reciprocating slide 54, and in a socket 55 in this slide is secured a bottom punch 56 by means of a set screw 57, which passes through an opening in the slide and enters the recess 58 in the punch. This punch 56 is provided with an enlarged head portion 59 which fits snugly within the cylindrical portion 48 of the die bore and provides a convenient and satisfactory means for removing the formed cup from the die.

As shown in Fig. 1, the slide 54 is provided with a laterally and downwardly extending arm 60 in the bifurcated end 61 of which is journaled a roller 62, which is adapted to rest on a cam surface 63, and be actuated thereby. This cam surface 63 may be connected with the working parts of the press in a well known manner so that when the upper punches are withdrawn from the die forming bore, the slide 54 will be caused to move upward by contact of the sheave 62 with the cam surface 63 and the bottom punch 56 will be moved up through the die forming bore and carry the formed cup up to the upper surface of the die as shown in Fig. 5. At 64 the die block 37 is provided with an opening which extends through the block and is of a size to allow the formed cups to drop therethrough when carried to this point by the rotation of the dial. To rotate the dial a pawl 65 is provided pivoted at 66 and this pawl may be connected with the working parts of the machine so that at each complete operation of the punch this dial may be moved about its axis 39 the distance between two of the notches 67 in the peripheral edge of the dial, with which the pawl is adapted to cooperate. There are preferably as many of these notches in the periphery of the dial as there are of the openings 40 in the surface of the dial, so that at each operation of the press gate the dial will be moved the distance between two of the openings 40 in order that a new disc may be presented to the punches for the next operation thereof.

The operation of the parts described is as follows:

The openings 40 which lie between the discharge hole 64 in the die, and the heating coils 42, are kept supplied with the blank discs 41 in any convenient way. The machine is started by the pulley wheel 14 being set into rotation, and the gate will be brought down toward the die block, the punches 25, 30, and 35 being thrust into the die forming bore and upon the continued movement of the crank 13, the gate will be moved upwardly, withdrawing the punches from the bore. As the punches are withdrawn from the bore, the bottom punch 53 will be caused to follow them up as previ-

ously described, it being actuated by the cam surface 63 engaging the sheave 62 of the slide. At each complete operation of the gate, the dial 38 will be rotated the distance between two of the adjacent notches 67. Each disc will, in its travel, rest on one of the heating coils 42 during the time required for one operation of the gate and on the second of the heating coils during a like interval of time. The discs will then be carried on until they rest under the punches and in alignment with the die forming bore as shown in Fig. 3. With a disc in this position, the gate is brought down and the disc is forced downward into the forming bore and there given the proper shape to form the complete cup 68 as shown in Fig. 8 of the drawings. The edge of the disc will be cupped up and folded around the inside punch 30 which maintains a uniform inside diameter for the cup, of a proper size. When in this operation, the stripper punch 35 strikes the blank 41, 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 of Figures 4 and 5. This relative movement between the outside and the inside punches permits 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 and to form cut out portions or scallops 68^a, on this edge of the cup. As shown in Figures 4 and 8, the projecting portions of the scalloped edge of the outside punch crush downwardly the opposing portions of the upper cupped edge of the blank, thus forming the scallops as shown.

On the upward movement of the gate and punches, the springs 29 and 34 urge the inside and stripper punches downwardly 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 formed cup dropping on the bottom punch, and thereby being carried upward to the surface of the die where it may be conveniently carried away by the rotation of the dial. When the completed cup is moved to a position above the discharge opening 64 in the die block, it will drop through this opening into a suitable receptacle or the like, not shown. This hole in the dial, which is now vacant may be supplied with another blank and the series of operations begun again.

While I have shown and described a pre-

ferred embodiment of my invention as applied to a machine for making paper cups, it will be understood that the invention is not limited to the exact form shown or to the use described. It is evident that various modifications and changes may be made in the structure of the machine shown and that articles of various shapes may be made from a wide variety of materials thereby, all of which will lie within the spirit of the invention and within the scope of the appended claims.

What I claim is:

1. A cupping press having means to form a blank into cup shape, and a blank heating means adjacent said forming means.

2. A cupping press having a supporting base, a die in which blanks are formed into cup shape and means for heating the blanks prior to the forming thereof.

3. A cupping press having a supporting base for the cup blanks, and a blank heating means adjacent said base to heat the blanks prior to the cupping operation.

4. In a press for cupping disc blanks, a supporting base, heating means adjacent said base, and means to move said blanks over said base.

5. In a press for cupping disc blanks, a supporting base, heating means adjacent said base and means to move said blanks into position to be heated by said heating means.

6. A cupping press, comprising in combination, means for cupping a blank of fibrous sheet material, and means for heating the blank to render it plastic during the cupping operation.

7. In a device for cupping disc blanks, a supporting base, heating means adjacent said base, and means for presenting said blanks to said heating means.

8. A cupping press, including in combination, means for cupping a blank of fibrous sheet material and means for scalloping the edge of the cupped blank.

9. In a device for cupping disc blanks, a supporting base, heating means in said base, and means for depositing said blanks upon said heating means.

10. A cupping press having a supporting base provided with a recess, and a heating element positioned in said recess.

11. A press for cupping blanks, having means for applying heat to said blanks prior to the cupping thereof.

12. A press for cupping blanks provided with heating means and a forming die, and means to present one of said blanks to said heating means and die successively.

13. A press for cupping disc blanks provided with heating means and means to deposit said disc blanks thereon.

14. A press for cupping disc blanks, pro-

vided with heating means and means to bring said disc blanks in position to be heated thereby.

15. A cupping press for disc blanks having a die block, a heating means in said block, and a dial rotatably mounted on said block to present the blanks to the heating means.

16. A press for cupping blanks, comprising a die having a forming bore, a punch cooperating therewith, heating means, and means to present a blank to said heating means and thereafter to said punch and die.

17. In a machine for cupping blanks, a die block, a die provided with a forming bore, a punch cooperating therewith, heating means in said block, means to present a blank first to said heating means and afterward, to said punch.

18. In a machine for cupping blanks, a die block, a die provided with a forming bore, a punch cooperating therewith, heating means, and an intermittently rotatable member to present a blank first to said heating means and afterward to said punch.

19. A cupping press provided with a cup forming means, means to carry a blank to said forming means, and a heating means in the path traversed by said blank.

20. In a device for cupping blanks, a cup forming means, means for carrying the blanks to said forming means, a heating means in the path traversed by said blanks, said carrying means permitting a blank to lie adjacent said heating means during one operation of said forming means.

21. In a device for cupping blanks, a cup forming means, means for carrying the blanks thereto, a plurality of heating means, means for permitting a blank to lie adjacent each of said heating means during an operation of said forming means.

22. In a device for cupping blanks, a plurality of heating means, and means for presenting a blank successively to each of said heating means.

23. In a device for cupping blanks, a cup forming means, means for carrying the blanks thereto, a plurality of heating means, means for positioning a blank adjacent to one of the heating means during an operation of the forming means, and adjacent a second heating means during a successive operation of said forming means.

24. A forming punch for shaping a paper blank comprising means to hold the edge of a blank against lateral displacement, and means to crush down portions of said edge while so held.

25. A forming punch for shaping a paper cup, comprising an inside punch adapted to enter the cup, and an outside punch adapted to thicken the upturned edge of said cup.

26. A cupping press, including in combi-

nation means for cupping a blank of sheet material, and means for thickening laterally the edge of the cup blank.

27. A cupping press including in combination, means for cupping a blank of sheet material, and means for crushing the edge of the cup blank to thicken the same in a lateral direction.

28. A cupping press including in combination, means for cupping a blank of sheet material, and means for exerting a crushing pressure in a vertical direction upon the edge of the cup blank to thicken the same laterally.

29. A cupping press for disk blanks having a die block provided with a die, a heating means in said block, and a dial rotatably mounted on said block to present the blanks first to the heating means and thereafter to said die.

30. A composite forming punch comprising an inside punch and an outside punch, the operating surface of said outside punch being provided with scallops or indentations.

31. In a paper cupping press, means to shape a cup from a paper blank and means to form scallops or indentations in the edge of a cup.

32. In a cupping press, means to form a cup from a paper blank and means to form scallops in the edge of said cup at the same operation of the press.

33. In a paper-cup forming press, means to heat a blank from which the cup is to be formed, means to form said blank into cup shape, and means to crush the edge of said formed cup to provide scallops or indentations therein.

34. In a paper-cup forming press, means to heat a paper cup, and means to scallop the edge of said heated cup.

35. In a cup forming press, means to heat a cup, means to support the upturned edge of said cup, and means to scallop said edge.

36. In a paper-cup forming press, means to hold the upturned edge of a cup against lateral displacement, and means to scallop the edge while so held.

37. In combination, means for cupping a blank of fibrous sheet material, means for heating the blank to render it plastic during the cupping operation and means to form scallops in the edge of the formed cup.

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

HAROLD DE OLANETA,