Z. LIPOWSKI.

METHOD OF MAKING CUPS.

APPLICATION FILED MAY 24, 1920.

1,403,043. Patented Jan. 10, 1922.

2 SHEETS—SHEET 1.

Fig 1

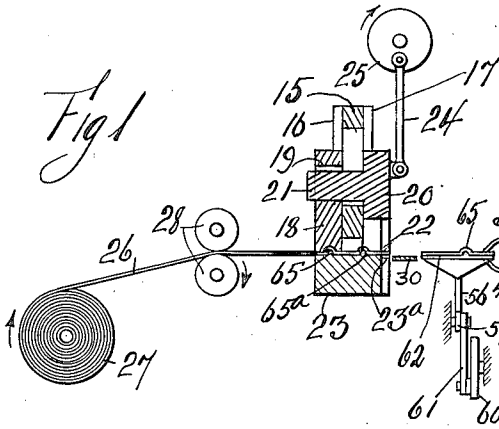


Fig 3a

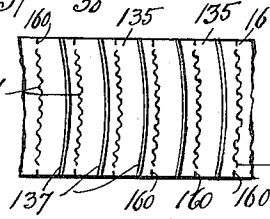


Fig. 3

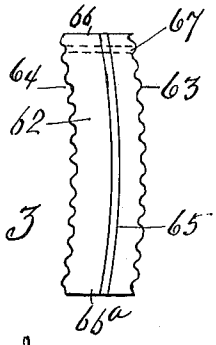


Fig. 2

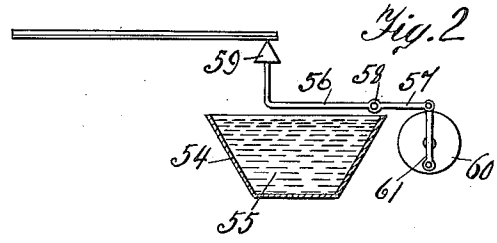


Fig 4

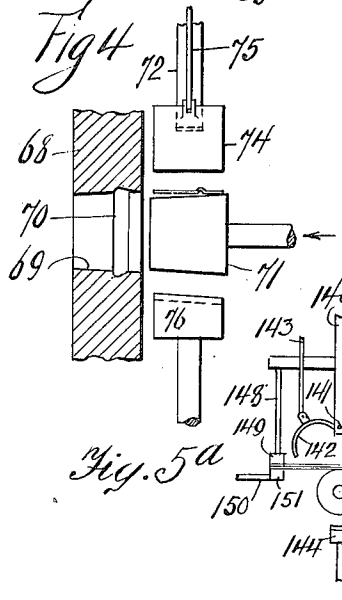


Fig 5

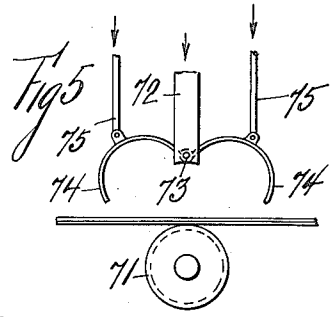
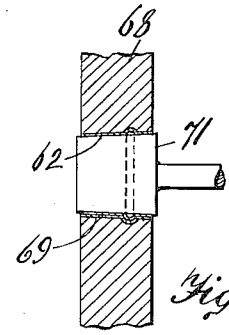


Fig. 5a

Fig. 6



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2 SHEETS—SHEET 2.

Fig. 7

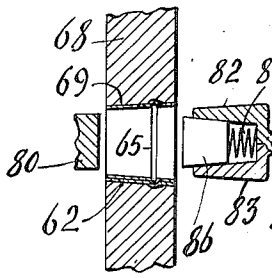


Fig. 8

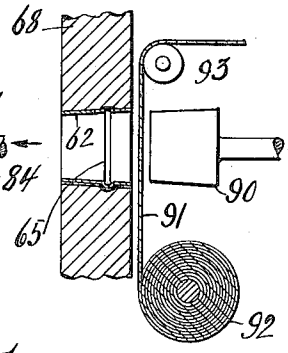


Fig. 9

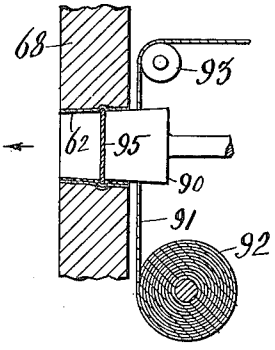


Fig. 10

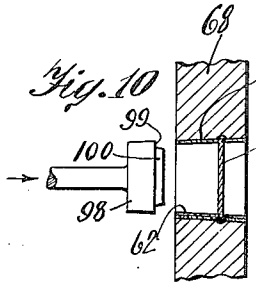


Fig. 11

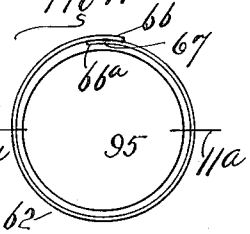
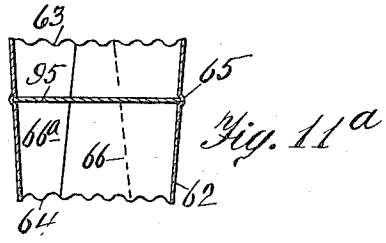


Fig. 11a



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UNITED STATES PATENT OFFICE.

ZYGMUNT LIPOWSKI, OF HOBOKEN, NEW JERSEY.

METHOD OF MAKING CUPS.

1,403,043. Specification of Letters Patent. Patented Jan. 10, 1922.

Application filed May 24, 1920. Serial No. 383,672.

To all whom it may concern:

Be it known that I, ZYGMUNT LIPOWSKI, citizen of the Republic of Poland, and resident of Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in a Method of Making Cups, of which the following is a specification.

This invention relates to an improved method of making cups, and is particularly directed to the steps employed in making tubular paper charlotte russe cups. One of the novel points of the method consists in forming a crease in the wall of the cup and forcing a disc, to constitute the bottom of the cup, into said crease to obviate the necessity of using any adhesive to secure the said bottom in place. With the apparatus to be described, a plurality of cups are simultaneously formed, that is to say, upon the partial completion of one cup, another is started. In the present instance four cups are in the course of manufacture at the same time.

The accompanying drawings exemplify the apparatus for carrying out the different steps of the method, and show the cup produced.

Fig. 1 shows a side view and partial section of apparatus to form the blank for the wall of the charlotte russe cup and means for coating an end portion thereof with an adhesive; Fig. 2 is a left hand side view of a portion of Fig. 1; Fig. 3 is a top plan view of a blank for the wall of the cup; Fig. 3ª is a top plan view on a reduced scale of a modified blank for the walls of a plurality of cups, Fig. 4 is a side view of a rotating disc and appurtenances for pressing the wall of the cup to its proper form; Fig. 5 represents a right hand side view of Fig. 4, Fig. 5ª shows a modification of Fig. 5 on a reduced scale, Fig. 6 is a view of some of the elements of Fig. 4 in a different position, Fig. 7 is a sectional view of the disc and an automatic expanding punch, Fig. 8 represents a sectional view of the disc with a cutting punch and their appurtenances; Fig. 9 is a view similar to Fig. 8 with some of the elements in another position; Fig. 10 shows a sectional view of the disc and a knockout punch; Fig. 11 represents a top plan view of the completed charlotte russe cup and Fig. 11ª shows a section of Fig. 11 on the line 11ª, 11ª.

Referring to Figs. 1 and 2, a guide frame 15 has connected thereto the dovetailed guides 16 and 17, a reciprocating die 18 with the opening 19 is slidably connected to the guides 16 and a crosshead 20 with the boss 21 and corrugated blade 22 is slidably connected to the guides 17.

The boss 21 extends through the opening 19. A stationary bottom die 23 has connected thereto the corrugated blade 23ª. A connecting rod 24 has one end pinned to the cross-head 20 and its other end is pinned to a rotating disc 25. A paper band 26 extending from a roll 27 is used for making the side wall of the cup and is fed through a pair of pressure rollers 28 to the dies 18 and 21. A supporting table 30 is located adjacent to said blades. Two pairs of grippers like 35 have each journaled to its legs 36, rollers 37 that are guided in the guides 38. A link 39 has one end connected to the fulcrum pin 40 of the grippers. A bell crank 43 is pivoted on the pin 44 and has the arms 45 and 46. The arm 45 is pinned to the link 39. A crank disc 50 has pinned thereto one end of the connecting rod 51 and the other end of said rod is pinned to the arm 46. A pot 54 contains an adhesive 55. A lever having the arms 56 and 57 is pivoted on the pivot 58 over the pot 54. A triangular dipping point 59 is carried on the arm 56. A crank disc 60 has pivoted thereto one end of a link 61 and the other end of the latter is pivoted to the arm 57.

In Fig. 3 the side wall of the cup while still flat is shown at 62 with the corrugated edges 63, 64, the crease 65, the ends 66, 66ª and the adhesive 67.

Referring to Figs. 4, 5 and 6 a fragmentary portion of a rotating disc 68 has formed therein a tapered female die 69 with the annular clearance channel 70. A tapered reciprocating forming punch 71 coacts with the die 69. A reciprocating bar 72 has pivoted thereto on the pin 73, the semi-cylindrical folding wings 74. The latter are actuated by the reciprocating links 75. A reciprocating bottom closing punch 76 coacts with the folding wings 74.

In Fig. 6 the disc 68 is shown with the wall 62 of the cup seated in the die 69 with the punch 71 bearing on the inner face of the wall 62 of the cup. The folding wings 74 and the closing punch 76 are shown removed from the punch 71.

In Fig. 7 the punch 71 has been withdrawn from the disc 68 and the latter has

been revolved with its die 69 and located axially in line with a stop punch 80 and an automatic tapered expanding punch 81. The latter comprises the hollow tapered cylindrical members 82 and 83 pivoted on the reciprocating rod 84 by means of the pin 85. A tapered plug 86 is located within the members 82 and 83 and a helical spring 87 connects the plug 86 and the roof of one of the members of the punch 81.

In Fig. 8 the expanding punch 81 has been withdrawn from the disc 68 and from the wall 62 therein, and the said disc 68 has been revolved with the longitudinal axis of its die 69 axially in line with the tapered cutting punch 90. A band of paper 91 leads from a roll 92 between the disc 68 and the punch 90 to the guide roller 93. In Fig. 9, the punch 90 has pierced the band of paper 91 forming the disc 95, which latter has been located in the crease 65.

In Fig. 10 the cutting punch 90 has been withdrawn from the wall 62, and the finished charlotte russe cup is located in the die 69. The disc 68 has been revolved with the die 69 axially in line with the knock-out plunger 98. The latter is shouldered at 99 to form the reduced portion 100. To detach the cup from the die 69, the plunger 98 is moved to locate the reduced portion 100 within the bottom end of the cup and the shoulder 99 is brought to bear against the bottom edge of the wall 62.

In Figs. 11 and 11[a] the completed cup is shown after being detached from the die 69.

The crease 65 forms a bearing seat for the disc 95. The ends 66 and 66[a] of the wall 62 overlap each other and are connected to each other by the adhesive 67.

In the modification indicated, Figs. 3[a] and 5[a], there is shown a plurality of side walls 135 that have formed therein the corrugated slots 136 that form the top and bottom edges of the cups.

The corrugated slots 136 do not extend entirely across the blank. A crease 137 is formed in each of the walls 135.

Referring particularly to Fig. 5[a] a reciprocating bar 140, similar to 72, has pivoted thereto on the pin 141 the semi-cylindrical folding wings 142. The latter are actuated by the reciprocating links 143 similar to 75. A reciprocating bottom closing punch 144 similar to 76 coacts with the folding wings 142. A cross bar 145 extends from the bar 140 and has extending therefrom the knife bars 148 with the knife blades 149. Knife bars 150 have attached thereto the stationary knife blades 151. The blades 149 coact with the knife blades 151.

To produce the cup the disc 25 is rotated by means of which the cross head 20 is reciprocated. Upon the down stroke of the crosshead 20 the blade 22 forms one of the corrugated edges of the wall 62 and the crease 65 is formed by the die 18, the similar crease 65[a] having been made by the die 18 in its previous down stroke. It will be noted that upon the down stroke of the crosshead 20, the die 18 descends therewith and forms the crease 65 a little ahead of the operation of the knife blades 22 and 23[a]. Upon the up stroke of the crosshead 20, the grippers 35 pull the severed wall 62 over the dipping point 59. The disc 60 rotates and causes the dipping point 59 to become immersed into the adhesive 55 of the tank 54 and to be in proper position at the proper instant to contact with the wall 62 adjacent to the end 66. The grippers locate the wall 62 upon the punch 71 and the folding wings 74 close upon the wall 62 and locate it around said punch. Immediately thereafter, the closing punch 76 bears up against the wall 62 and causes the end 66 of the wall 62 to become fastened to its other end 66[a].

The wings 74 and punch 76 next recede from the punch 71, the latter having the wall 62 located thereon. The punch 71 carries the formed wall 62 into the female tapered die 69 as indicated in Fig. 6. The disc 68 rotates and is brought, with the partially formed cup, axially in line with the stationary stop 80, (Fig. 7) and the expanding punch having the members 82 and 83. The latter now enter the wall 62, presses it into proper form and causes the pasted ends of the cup to become securely fastened to each other.

The disc 68 is next brought to the position shown in Fig. 8 opposite the band of paper 91 and with the formed wall 62 axially in line with the cutting punch 90. The latter now moves and cuts the disc 95 from the band 91 and forces it in place in the crease 65 as indicated in Fig. 9, and constitutes the bottom of the cup. The disc 68 is again rotated so that the formed cup will be located axially in line with the knock-out plunger 98, which latter moves and removes the cup from the disc 68, the reduced portion 100 of the plunger 98 entering the bottom of the cup and the shoulder 99 bearing against the bottom edge thereof.

Referring particularly to Figs. 3[a] and 5[a], the paper band 26 has formed therein the corrugated slots 136 which do not extend to the side edges of the wall 135, by means of blades like 22 and 23[a] that do not extend over the full width of the wall 135.

One end of the wall 135 is then coated with an adhesive as already described. The wall is next located on the forming plunger 71 (see Fig. 5[a]) and the forming blades 142 and the closing punch 144 bend it on the said punch 71 as described for the folding wings 74 and bottom closing punch 76. At the same time the knife blades 149 and 151 sever the wall 135 at 160 between the ends

of the corrugated slots 136 and the sides of the said wall. The succeeding steps are similar to these already described, four cups being simultaneously formed.

Having described my invention, what I desire to secure by Letters Patent and claim is:

1. The method of making a cup consisting in forming a flat blank with a crease in the body thereof, coating one of the ends of the blank with an adhesive, folding the blank to the form of a frustum of a cone, pressing the ends of the formed blank together, cutting a disc from a band of material, inserting the disc into the crease of the formed blank and ejecting the formed cup from the apparatus in which it was made.

2. The method of making a cup consisting in forming a crease in a band of material, severing a portion of said band with its crease from the main portion thereof, coating one face of one end of the severed portion or blank with an adhesive, bending the blank to form a tubular cup-shaped wall, pressing the ends of the wall together, subjecting the cup shaped wall to further pressure, locating the cup-shaped wall opposite a band of material, cutting a disc from the latter band, forcing disc into the crease of the cup-shaped wall and ejecting the formed cup from the apparatus in which it was made.

3. The method of making a tubular paper cup consisting in forming a flat blank with creases therein, severing the blank between the creases to form corrugated edges, advancing the severed portions of the blank, coating one face of one side end of each severed portion with an adhesive, bending each flat blank to form a tubular cup-shaped wall, pressing the ends of the cup shaped wall together, subjecting the cup to pressure to force it to proper form, locating the cup shaped wall opposite a band of paper, forming a disc from the latter band, forcing the disc into the crease of each cup shaped wall and ejecting the formed cup from the apparatus in which it was made.

4. The method of making paper cups consisting in forming a flat blank, with corrugated top and bottom ends and a crease in body of the blank, coating one face of one side end of the blank with an adhesive, bending blank cup shaped, pressing the end of the blank having the adhesive to the other end, subjecting the cup shaped wall to pressure to force it to proper form, forming a disc of paper for the bottom of the cup, locating said disc into the crease, ejecting the cup formed from the operating apparatus, and during the operation of making the first cup forming one after the other, a plurality of similar cups.

5. The method of making tubular cups having the form of a frustum of a cone, consisting in forming creases across the width of a band, forming corrugated slots between the creases to within a short distance of the sides of the band, coating the band on one face near one side end thereof with an adhesive, severing the band in the portions between the ends of the corrugated slots and its sides, bending each severed blank portion to form a tubular cup shaped wall, pressing the ends of the cup shaped wall together to fasten the coated end to the other end, subjecting the cup shaped wall to pressure, cutting discs from a band and inserting one of said discs in crease of each cup shaped wall.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York, this 21st day of May, A. D. 1920.

ZYGMUNT LIPOWSKI.