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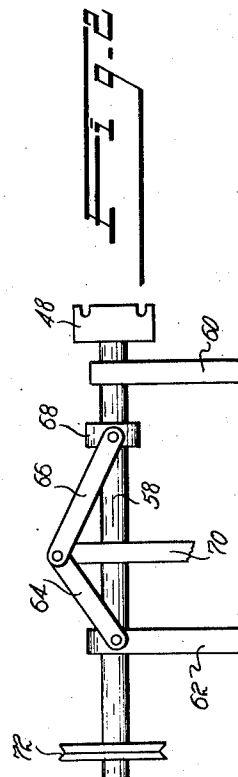
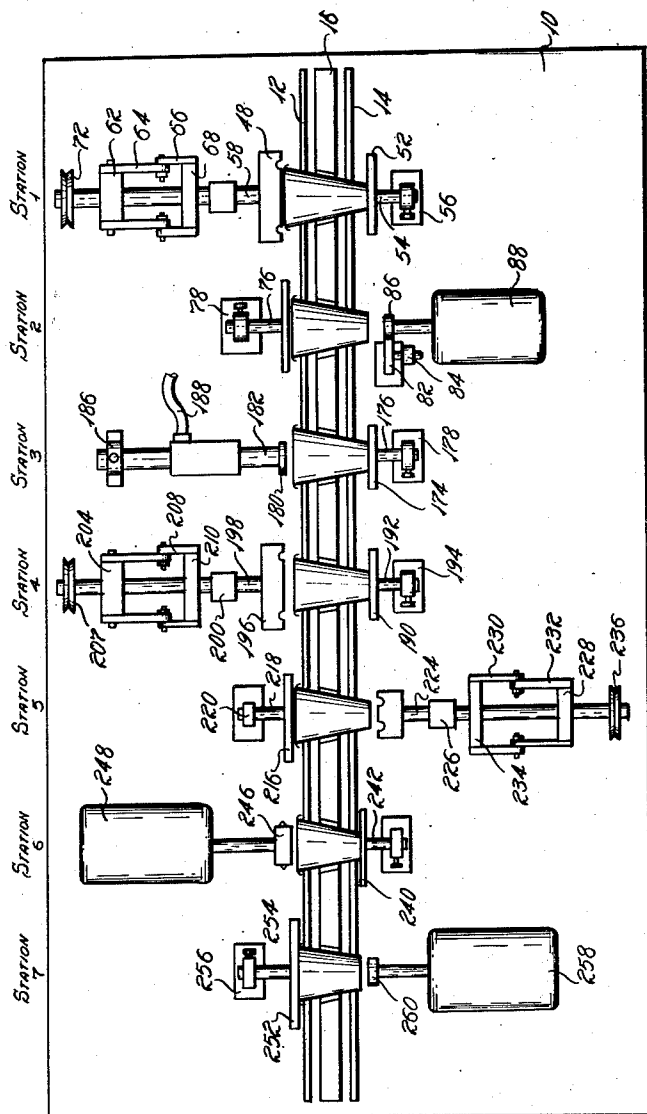
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METHOD OF MANUFACTURING PAPER CONTAINERS

Filed Nov. 23, 1955

4 Sheets-Sheet 1



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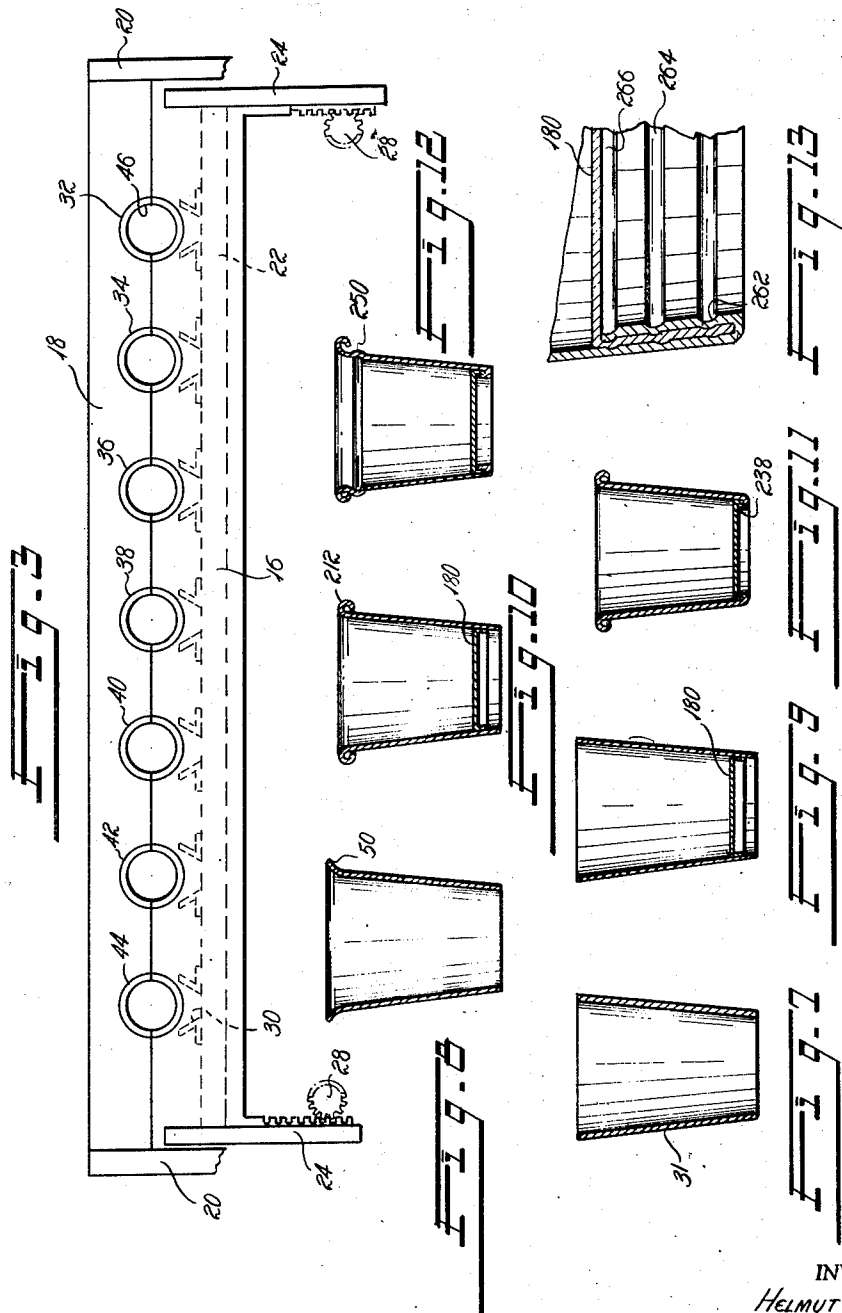
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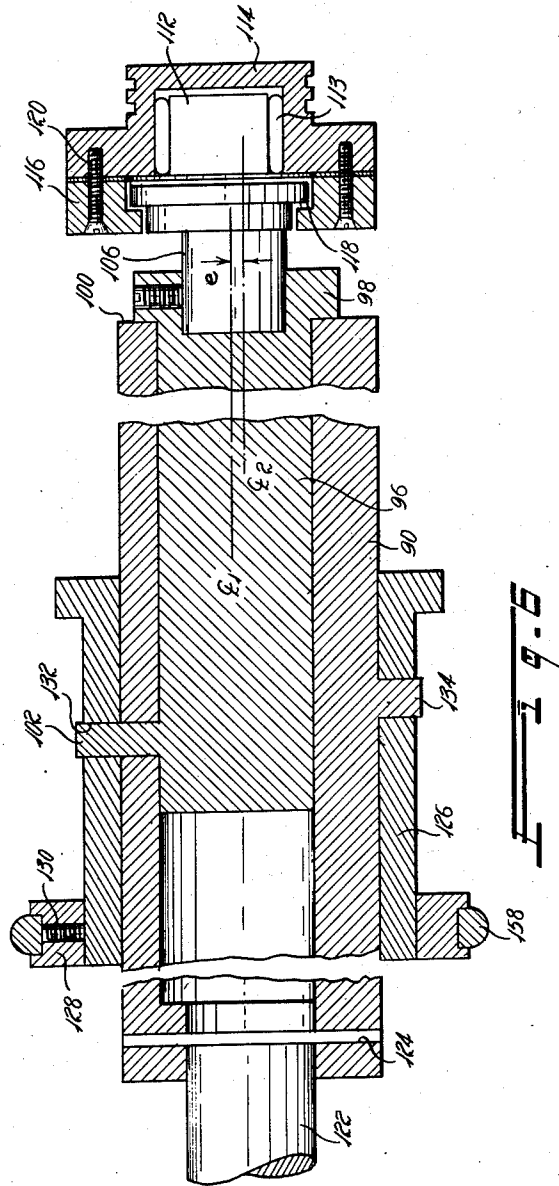
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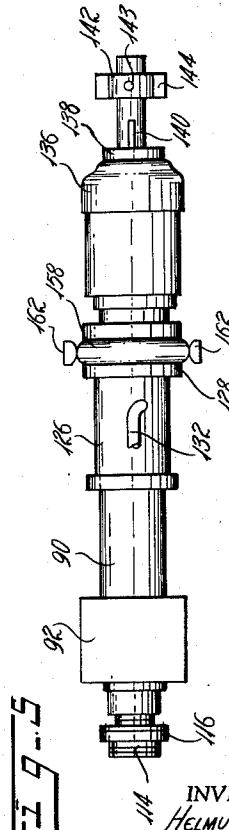
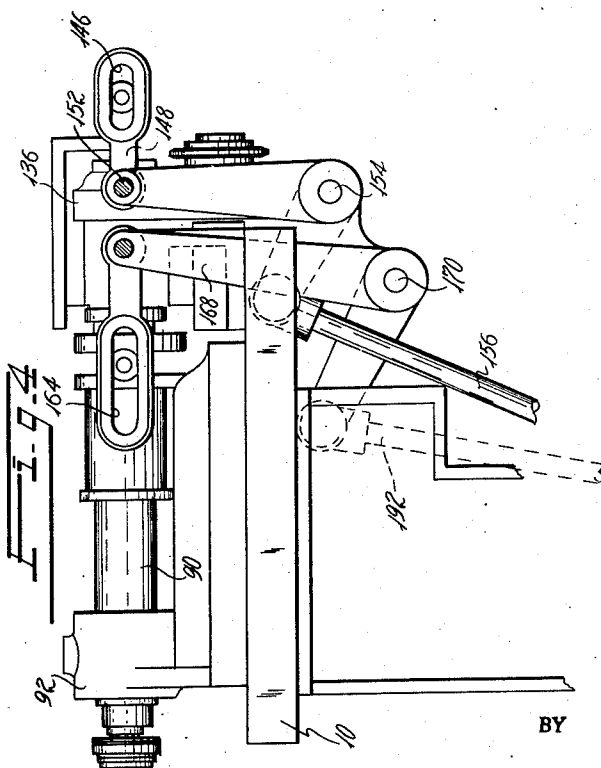
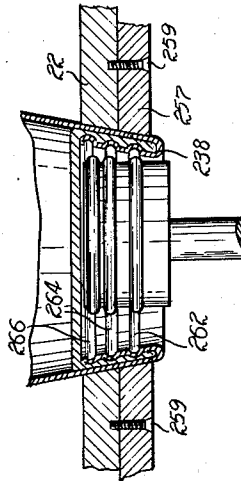
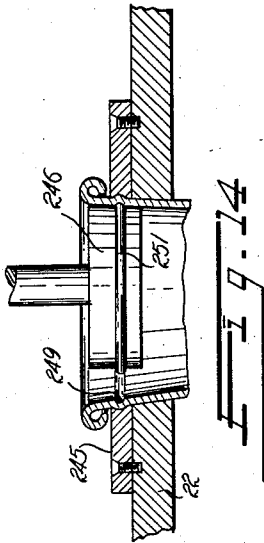
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METHOD OF MANUFACTURING PAPER CONTAINERS

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17 Claims. (Cl. 93—55.1)

This invention relates to the manufacture of containers and more particularly to cup-like containers formed from paper material, such as paper, paperboard and similar materials. Still more particular the invention relates to a method of finishing tube like cup bodies.

While various automatic machines have been heretofore utilized for manufacturing paper containers, particularly paper cups, these have been relatively complex and for the most part have utilized mandrels for maintaining the cup bodies in position during the formation of the cup bottom. Since the mandrel must enter the normally frusto-conical cup body from its large end, it is necessary to remove the body from the mandrel prior to performing any finishing steps near the mouth of the cup.

It is accordingly a primary object of the present invention to provide an improved method of manufacturing paper containers in a simple, economical and time saving fashion.

It is another object of the invention to provide a method of manufacturing paper containers and for mounting bottoms in container bodies without the use of body supporting mandrels during the bottom mounting operation.

It is another object of the invention to provide a method for manufacturing sturdy, fluid-tight paper containers by means of a process wherein the container bodies are moved in a direction transverse to their longitudinal axis through a plurality of processing stations.

It is a further object of the invention to provide such a method of manufacture paper containers utilizing a novel method of mounting the bottoms therein.

These and other objects and advantages of the invention will become apparent upon reference to the following specification and claims and appended drawings wherein:

Figure 1 is a diagrammatic plan view of a machine for manufacturing cups according to the invention showing a series of cups undergoing processing;

Figure 2 is a side elevation of one of the die actuating mechanisms;

Figure 3 is a front elevation showing the guide plates and advancing bar;

Figure 4 is a side elevation showing one of the eccentric die operating mechanisms;

Figure 5 is a plan view of the shaft assembly in the eccentric die operating mechanism of Figure 4;

Figure 6 is a vertical cross section of one of the eccentric die shaft assemblies;

Figures 7, 8, 9, 10, 11 and 12 are cross sections of containers at various stages in the process;

Figure 13 is a cross section of the bottom of a container after the process has been completed;

Figure 14 is a horizontal cross section of a portion of the lower guide plate at the groove forming station; and

Figure 15 is a horizontal cross section of a portion of the lower guide plate at the bottom grooving station.

Referring to Figure 1 there is shown a cup finishing machine consisting of a table 10 which carries sets of guide plates 12 and 14 and a cup advancing bar 16. Referring to Figure 3, each set of guide plates consists of

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an upper guide plate 18 affixed to the table 10 by means of a pair of supports 20 at either end thereof, and of a lower guide plate 22 movably mounted upon the table by means of a pair of supports 24 carrying racks 26 which engage pinions 28 operated by some suitable mechanical arrangement such as motors or cams. The cup advancing bar 16 is mounted for transverse oscillating movement along its longitudinal axis and carries cup support brackets 30 which are so spaced as to firmly grasp a cup nested therebetween.

The cup guide plates 18 and 22 are provided with a series of seven apertures 32 through 44 which are formed by semi-circular openings in the upper and lower guide plates. It is to be understood that the guide plates shown in Figures 3 constitute the top guide plates 12 of Figure 1 whereas the bottom guide plates may be seen through the apertures in Figure 3 at 46.

At the beginning of an operation the lower guide plates are lowered by means of the racks 26 and pinions 28 to such a position that a cup may be fed to the brackets 30 on the advancing bar 16 corresponding to the aperture 32 in the guide plates which shall be called station 1. The lower guide plate 22 is then raised by means of the racks and pinions to lift the cup body off of the advancing bar 16 and firmly clamp it between upper guide plate 18 and lower guide plate 22. The first of seven operations upon the cup body occurs at this time and the lower guide plate 22 is then lowered to allow the cup body at station 1 to rest upon the advancing bar 22 between the brackets 30. The advancing bar 16 then moves in a leftward direction until the brackets originally adjacent station 1 are adjacent the next station 2, and the lower plate 22 is then raised to lift the cup body from the advancing bar to clamp it in the aperture 34. The second operation then takes place and the cup body is thereupon released by lowering the guide plate 22 and is advanced consecutively through the remaining stations in the same manner. As the first cup body leaves station 1 another cup body is fed to the advancing bar 16 so that a continuous series of cups is going through the various steps in the process simultaneously.

Referring to Figure 7 there is shown a cross section of a cup body 31 in the form in which these are supplied to the guide plates 12 and 14 preparatory to the finishing operation. After the cup body 31 has been clamped between the guide plates 12 and 14 at station 1, a pre-curling die 48, best seen in Figure 1, moves into the mouth of the cup in order to impart a preliminary curl to the peripheral edge of the cup mouth as shown at 50 in Figure 8. The cup is prevented from moving away from the die by means of the holding action of the plates 12 and 14 and also by means of the stop plate 52 which is supported by means of a rod 54 and mounting bracket 56. The die 48 is carried by means of an actuating rod 58 passing through support journals 60 and 62.

Referring to Figure 2 it will be seen that motion is imparted to the die 48 by means of a jack linkage consisting of jack links 64 and 66 which are pivoted respectively to the journal 62 and to a collar 68 pinned or otherwise secured to the rod 58. The jack link is actuated by means of actuating bars 70 which may be driven by any suitable means such as a cam or a hydraulic cylinder. Where cups are being manufactured from heavy paper stock it may be desirable to rotate the die 48 and the pulley 72 on the outer end of the bar 58 may be utilized for this purpose.

After this original pre-curling action the cup body advances to the station 2 where an adhesive is applied to the inside of the lower end of the cup preparatory to mounting the cup bottom. A stop plate 74 is mounted adjacent the pre-curved mouth of the cup by means of a rod 76 and bracket 78 and an adhesive pan 80 is

mounted upon the table 10 on the other side of the cup body. Adhesive is picked up from the pan 80 by means of a disc 82 rotatably mounted in a bracket 84 and engaging a disc 86 driven by an eccentric drive mechanism 88 presently to be described in detail. The disc 86 is driven by the eccentric drive 88 and rotates against the disc 82 which picks up adhesive from the pan 80 and transfers it to the edge of the disc 86. The eccentric drive mechanism 88 then moves the disc 86 into the lower end of the cup blank at station 2, whereupon the disc 86 commences to rotate eccentrically to apply glue to the inside of the container body.

Referring now to Figures 4, 5 and 6 there are shown the details of the eccentric mechanism 88. Since this same type mechanism is utilized to drive other dies during the course of the process it is illustrated in Figures 4, 5 and 6 with a die tool rather than with the adhesive applying disc 86.

Referring to Figure 4 an outer shaft 90 is carried by a journal 92 mounted upon the table 10. The outer shaft 90 is eccentrically bored at 94, as shown in Figure 6, to receive an eccentric shaft 96 having a head 98 which butts against the end 100 of outer shaft 90. Eccentric shaft 96 is provided with a pin 102 which passes through a peripheral slot 104 in outer shaft 90 to axially fix the eccentric shaft 96 with respect to outer shaft 90. A die shaft 106 is concentrically mounted in the head 98 of eccentric shaft 96 and is secured thereto by means of a set screw 108. The die shaft 106 carries an eccentrically mounted head 110 and stud shaft 112 which is received in bearings 113 in the die 114. The head 110 is secured to the die 114 by means of a fastening ring 116 which is provided with a shoulder 118 and is fastened to the die by means of screws 120.

Because of the eccentric mounting of the eccentric shaft 96 in the outer shaft 90 and because of the eccentric head 110 and shaft 112 on the die shaft 106, it will be apparent that rotation of the eccentric shaft 96 within the outer shaft 90 is effective to vary the position of the head 110 and die 114 from concentricity to eccentricity with relation to the outer shaft 90. Thus in the position shown in Figure 6 the head 110 and die 114 occupy a position of maximum eccentricity. If the eccentric shaft and attached head 110 are then rotated through 180 degrees the head 110 and die 114 are brought into concentricity with the outer shaft 90.

The outer shaft 90 is driven by means of a drive shaft 122 which is concentrically pinned thereto by means of a pin 124. A sleeve 126 is mounted upon the outer shaft 90 and has a collar 128 secured thereto as by means of a set screw 130. The pin 102 on eccentric shaft 96 passes through a curved slot 132 in the sleeve 126 in such a manner that longitudinal movement of sleeve 126 with respect to outer shaft 90 causes rotation of eccentric shaft 96 with relation to outer shaft 90. Outer shaft 90 is fixed with respect to sleeve 126 by means of a pin 134.

Referring now to Figures 4 and 5 it will be seen that outer shaft 90 is carried in journal 92 while drive shaft 122 is carried in a journal 136. A drive gear 138 is slidably mounted upon drive shaft 122 adjacent journal 136 and is keyed thereto by means of a keyway 140 and key, not shown. Drive shaft 122 has a cross head 142 fixed to its free end by means of a set screw 143, as seen in Figure 5, and the cross head 142 has a pair of roller bearings 144 which are received in a slot 146 in a link 148 which is pivoted to a bell crank lever 150 at 152. The bell crank lever 150 is pivoted to the table 10 at 154 and is actuated by means of a rod 156. Movement of the rod 156 causes the drive shaft 122 to be moved axially by means of link 148 and this also moves outer shaft 90, eccentric shaft 98, die shaft 106 and sleeve 126. Drive shaft 122 slides through gear 138 but is rotationally fixed thereto by keyway 140. Sleeve 126 is rotationally secured to outer shaft 90 by means of pin 134 while eccentric shaft 96 is rotationally secured to sleeve 126 by means

of pin 102. Because of this arrangement, rotation of drive shaft 122 causes rotation of die shaft 106 although die 114 need not rotate since it is carried on bearings 113.

Movement of rod 156 and bell crank 150 thus causes the drive shaft 122 to move to the left in Figure 4 to bring the die 114 within the end of the cup. After the die is within the end of the cup sleeve 126 is moved (to the left in Figure 4 and to the right in Figure 6) by means of a ring 158 which is received in a groove 160 in the collar 128. The ring 158 carries a pair of bearings 162 which ride in a slot 164 in a link 166 which is pivotally attached to a bell crank lever 168. The bell crank lever 168 is pivotally fastened to the table 10 at 170 and is driven by means of a rod 172. As the sleeve 126 moves to the right in Figure 6 and to the left in Figure 4 under the influence of link 166, the pin 102 is caused to move rotationally with respect to sleeve 126 by means of the axial shift of the curved slot 132. This rotates eccentric shaft 96 and die shaft 106 with respect to outer shaft 90 thereby introducing eccentricity into the movement of the die 114.

The slot 132 and die shaft 106 are so positioned with respect to one another that the die 114 is concentric with outer shaft 90 in the normal position of bell crank 168 and movement of bell crank 150 does not change this relationship but merely moves the entire assemblage axially. Eccentricity is introduced when sleeve 126 is moved axially with respect to outer shaft 90 by means of the link 166 and bell crank 168. The die thereupon moves eccentrically about the center of outer shaft 90 so as to bring its peripheral die edge into contact with the inner surface of the cup in a rolling manner. Because of the rotational mounting between the die 114 and the die shaft 106 the surface of the die does not skid or slide across the inner surface of the cup but merely rolls therearound in the manner of a planet gear within a ring gear. This provides for a small area of contact between the die and the cup body and makes it possible to obtain the desired cup deformation with a minimum of pressure. The same action occurs when the die is replaced with an adhesive applying disc.

Turning back now to Figures 1 and 3, it will be seen that the eccentric mechanism 88 causes the disc 86 to roll around the inside of the lower end of the cup at station 2 so as to evenly apply a coating of adhesive.

After adhesive has been applied at station 2 the cup body is advanced to station 3 where it abuts a stop plate 174 carried by a rod 176 in bracket 178. A flanged bottom 180, seen in cross section in Figure 9, is then inserted into the cup body by means of a vacuum arm 182 carried by journals 184 and 186. The vacuum arm 180 may be reciprocated either by means of a jack arrangement such as operates die 48 or by means of a rack and pinion such as is utilized to move the lower guide plate 22. The vacuum may be supplied by means of a hose 188 and may be cut on and off by suitable matching ports in the arm 182 and journal 184. After the bottom 180 has been inserted the cup appears as is shown in Figure 9.

Subsequent to the mounting of the cup bottom 180, the curl at the top edge of the cup is completed at station 4. A stop plate 190 is mounted at this station adjacent the lower end of the cup body by means of a rod 192 and bracket 194 and a suitable die 196 is carried by a reciprocable rod 198 mounted in a pair of journals 200 and 204. The die 196 is reciprocated by means of a jack link mechanism similar to that shown in Figure 2 consisting of linkages 206 and 208, the latter of which are connected to a cross head 210. The die is preferably electrically heated by means not shown and a pulley 207 is provided for rotating the die where the weight of the paper makes this necessary. Following the insertion of the die 196 in the upper end of the cup body by means of the jack linkage, the cup has a completed curved lip 212 on its upper end as is shown in Figure 10.

The cup then advances to station 5 where the lower end of the cup is folded in over the depending flange of the

cup bottom. A stop plate 216 carried by a bar 218 and bracket 220 abuts the upper end of the cup body while a suitable heated die 222 is carried by a bar 224 mounted in journals 226 and 228 and reciprocated by means of a jack link mechanism similar to that shown in Figure 2. Thus pairs of links 230 and 232 are joined respectively to a cross head 234 and to the journal 228 and are actuated by a pair of rods similar to rods 70 in Figure 2. A pulley 236 is provided on the end of shaft 224 for use in the event that heavy paper is utilized and spinning of the die becomes necessary.

The cup body, having its lower end bent inwardly over the depending flange on the cup bottom 180, as shown at 238 in Figure 11, now advances to station 6. At this station the bottom of the cup is supported by means of a stop plate 240 carried by a bar 242 and bracket 244 and is operated on by means of a groove forming die 246 driven by an eccentric mechanism 248 similar to the eccentric mechanism 88 shown in Figures 4, 5 and 6 and described in detail heretofore. A split plate 245 is fastened to guide plates 18 and 22 by means of screws 247, as is shown in Figure 14, and this plate is provided with a groove 249 which is complementary to the rib 251 on die 246. The cup body is thus grooved between mating die members so that no undesired deformation or distortion occurs. The die 246 forms a lid groove 250 shown in Figure 12 by rolling around the inner surface of the cup in the manner of the adhesive disc 86 at station 2. As has been pointed out heretofore the operation of this die is such that the groove formation may be performed with a minimum amount of pressure with a non-sliding substantially single point contact between the die and the inner surface of the cup body.

The cup body then advances to the final station 7 where it is supported by means of a stop plate 252 held by a bar 254 and bracket 256. A split support plate 257 is attached to the guide plates 18 and 22 by means of screws 259 in order to support the outer wall of the cup body. An eccentric drive mechanism 258, similar to the eccentric drive mechanisms 88 and 248, operates a die 260 which forms three parallel grooves 262, 264 and 266 in the upturned edge 238 of the cup bottom as shown in Figures 13 and 15. This securely locks the depending flange of the cup bottom 180 to the lower peripheral wall of the cup body so as to form a liquid tight seal. Again the die rolls around the inner surface of the cup body so as to form such grooves by means of a non-sliding substantially single point contact.

The cup at station 7 is then complete and is ejected by the next reciprocating motion of the cup feed bar 16.

The process of my invention thus consists of pre-curling the large end of a cup body by means of a die exerting simultaneous curling pressure around the entire periphery of the mouth while the opposite end of the cup is supported against axial movement, applying adhesive to the small end of the cup body by rolling said adhesive therearound by a single point contact without any sliding action, inserting a bottom having a depending flange into the cup from the large end into the small end so that the depending flange contacts the previously applied adhesive, completing the curl on the large end of the cup body by means of a heated die which exerts simultaneous pressure completely around the periphery of the cup while the opposite end is supported, curling the small end of the cup body inwardly around the depending flanges of the bottom while the large end of the cup is supported, forming a lid securing groove near the large end of the cup body by means of a substantially single point rolling pressure without any slipping or sliding, and forming a plurality of grooves in the infolded small end of the cup body by means of a substantially single point contact non-sliding die. The process is rapid in operation, necessitates a minimum of equipment, and can handle single or multiple ply cup bodies. The cups formed are structurally rigid and strong and possess a high degree of fluid tight integrity.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A method of finishing a paper cup body comprising the steps of outwardly curling the peripheral edge of one end of said body, applying adhesive to the inner surface of the other end of said body, inserting a flanged bottom into said body so that said flange contacts said adhesive, additionally curling the peripheral edge of said one end to form a closed bead, folding the edge of said other end inwardly about said flange on said bottom, forming a groove adjacent said bead, forming a plurality of grooves in said folded edge so as to lock said edge to said flange and supporting said cup body about its entire periphery at two spaced apart positions during each of the foregoing steps.

2. A method as set out in claim 1 including the steps of completely releasing said support between steps and moving said cup body in a direction transverse to its longitudinal axis before reestablishing said support.

3. A method of finishing a paper cup body comprising the following steps in combination: outwardly curling the peripheral edge of one end of said body while supporting the other end against axial movement, moving said cup body substantially normal to its axis, applying adhesive to the inner surface of the other end of said body, moving said cup body substantially normal to its axis, inserting a flanged bottom into said one end of said body and positioning said bottom so that its flange peripherally contacts said adhesive in said other end of said body, moving said cup body substantially normal to its axis, additionally curling the peripheral edge of said one end of said body to form a closed bead, supporting the other end of said body against axial movement during said last named curling step, moving said cup body substantially normal to its axis, folding the edge of said other end inwardly over the inner surface of said flange on said bottom while supporting said one end against axial movement, moving said cup body substantially normal to its axis, forming a peripheral groove adjacent said bead, moving said cup body substantially normal to its axis, and forming a plurality of parallel peripheral grooves in said folded edge so as to lock said edge to said flange on said bottom.

4. A method as set out in claim 3 wherein said curling steps are performed by applying pressure to said cup body around its entire periphery at one time.

5. A method as set out in claim 3 wherein said adhesive applying, and grooving steps are performed by applying pressure at substantially one point and moving this point about the cup body.

6. A method as set out in claim 5 wherein all of said steps are carried out simultaneously on a series of cup bodies.

7. A method of finishing a paper cup body comprising the following steps in combination: supporting a frusto-conical hollow cup body about its periphery at two axially spaced positions, outwardly curling the peripheral edge of one end of said body, removing said support from said body, moving said body transverse of its longitudinal axis, again supporting said body about its periphery at two axially spaced positions, applying adhesive to the inner surface of the other end of said body, releasing said support of said body, moving said body transverse of its longitudinal axis, again supporting said body, inserting a flanged bottom into said one end of said body and positioning said bottom so that its flange peripherally contacts said adhesive in said other

end of said body, releasing said support of said body, moving said body transverse of its longitudinal axis, again supporting said body, additionally curling the peripheral edge of said one end of said body to form a closed bead, releasing the support of said body, moving said body transverse of its longitudinal axis, again supporting said body, folding the edge of said other end inwardly over the inner surface of said flange on said bottom, releasing the support of said body, moving said body transverse of its longitudinal axis, again supporting said body, forming a peripheral groove adjacent said bead, releasing the support of said body, moving said body transverse of its longitudinal axis, again supporting said body, forming a plurality of parallel peripheral grooves in said folded edge so as to lock said edge of said flange on said bottom, and releasing the support of said body.

8. A method as set out in claim 7 wherein said curling steps are performed by applying pressure to said cup body around its entire periphery at one time.

9. A method as set out in claim 7 wherein said adhesive applying and grooving steps are performed by applying pressure at substantially one point and moving this point about the cup body.

10. A method as set out in claim 9 wherein all of said steps are carried out simultaneously on a series of cup bodies.

11. A device for finishing a paper cup body moving in a straight line comprising in combination, rotating means for curling the peripheral edge of one end of said body, means for applying adhesive to the inner surface of the other end of said body, means for inserting a flanged bottom into said one end of said body and advancing said flanged bottom into said body so that said flange contacts said adhesive at the inner surface of the other end of said body, rotating means for additionally curling the peripheral edge of said one end of said body to form a closed bead, rotating means for folding the edge of said other end of said body inwardly about said flange on said bottom, rotating means for forming a groove adjacent said bead, and rotating means for forming a plurality of grooves in said folded edge so as to lock that edge to said flange.

12. A device for finishing a paper cup body moving in a straight line comprising in combination, rotating means for curling the peripheral edge of one end of said body, eccentrically rotatable means for applying adhesive to the inner surface of the other end of said body, means for inserting a flanged bottom into said one end of said body and advancing said bottom into said body so that said flange contacts said adhesive on the inner surface of the other end of said body, rotating means for additionally curling the peripheral edge of said one end of said body to form a closed bead, rotating means for folding the edge of said other end of said body inwardly about said flange on said bottom, eccentrically rotatable means for forming a groove adjacent said bead, and eccentrically rotatable means for forming a plurality of grooves in said folded edge so as to lock said edge to said flange.

13. A device as set forth in claim 12 wherein each of said eccentrically rotatable means is capable of concentric rotation at a first position and automatically undergoes eccentric rotation when axially advanced to a second position.

14. A device for finishing a paper cup body comprising, a fixed pair of generally parallel horizontal elongated support members having spaced arcuate recesses in their

port members having spaced arcuate recesses in their upper edges, said movable members being mounted for upward movement into respective engagement with the lower edges of said fixed members and for downward movement to a position spaced from said fixed members, said arcuate recesses in said lower members being spaced to adjoin said arcuate recesses in said fixed members when said fixed and movable members are in contact, said recesses being of such a size to receive cup bodies and to clamp said cup bodies between said fixed and movable members when said members are in contact, means for moving said movable members, an elongated advancing bar mounted between said movable members for reciprocation along its longitudinal axis, spaced means on said bar for receiving cup bodies, and means for reciprocating said bar, said means for moving said movable members and said means for reciprocating said bar being synchronized so that said movable members lower cup bodies in the recesses therein into the cup body receiving means on said bar whereupon said bar moves said cup bodies a distance equal to the space between recesses and said movable members then move upwardly to pick up said cup bodies and clamp them against said fixed members.

15. A device as set out in claim 14 including cup body finishing means mounted adjacent the recesses in said fixed members for performing finishing steps on cup bodies clamped between said fixed and movable members.

16. A device as set out in claim 15 wherein said finishing means comprises individual spaced means comprising, rotating means for curling the peripheral edge of one end of a cup body held between a first set of recesses, means for applying adhesive to the inner surface of the other end of a cup body held between a second set of recesses, means for inserting a flanged bottom into said one end of a cup body held between a third set of recesses and advancing said bottom into said body so that said flange contacts adhesive previously applied, rotating means for additionally curling the peripheral edge of said one end of a cup body held between a fourth set of recesses to form a closed bead, and rotating means for folding the edge of the other end of a cup body held between a fifth set of recesses inwardly about the flange on the bottom therein.

17. A method of finishing a paper cup body comprising the steps of supporting said body about its periphery at two spaced apart positions, outwardly curling the peripheral edge of one end of said body, releasing said support and moving said cup body normal to its axis, reestablishing said support, applying adhesive to the inner surface of the other end of said body, releasing said support and moving said cup body normal to its axis, reestablishing said support, inserting a flanged bottom into said body so that said flange contacts said adhesive, releasing said support and moving said cup body normal to its axis, reestablishing said support, additionally curling the peripheral edge of said one end to form a closed bead, releasing said support and moving said cup body normal to its axis, reestablishing said support, and folding the edge of said other end inwardly about said flange on said bottom.

References Cited in the file of this patent

UNITED STATES PATENTS

1,706,910	Wright et al.	Mar. 26, 1929
1,862,835	Tsuchiya	June 14, 1932
2,252,360	Barbieri	Aug. 12, 1941
2,703,042	Goodwin	Mar. 1, 1955