

Oct. 16, 1934.

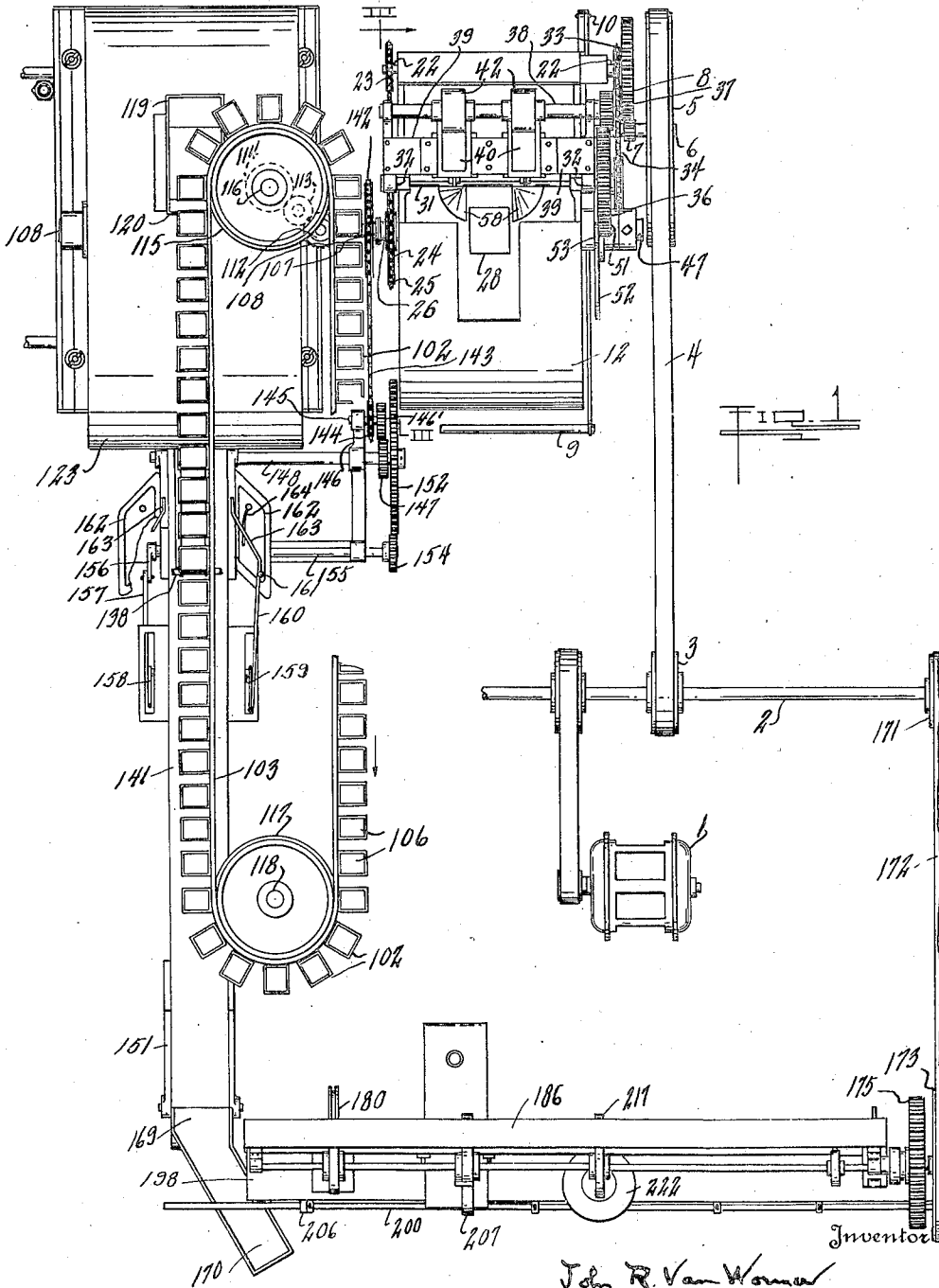
J. R. VAN WORMER

1,977,502

SINGLE SERVICE PACKAGING

Filed May 14, 1928

9 Sheets-Sheet 1



334

Geo. Kirk

Attorney

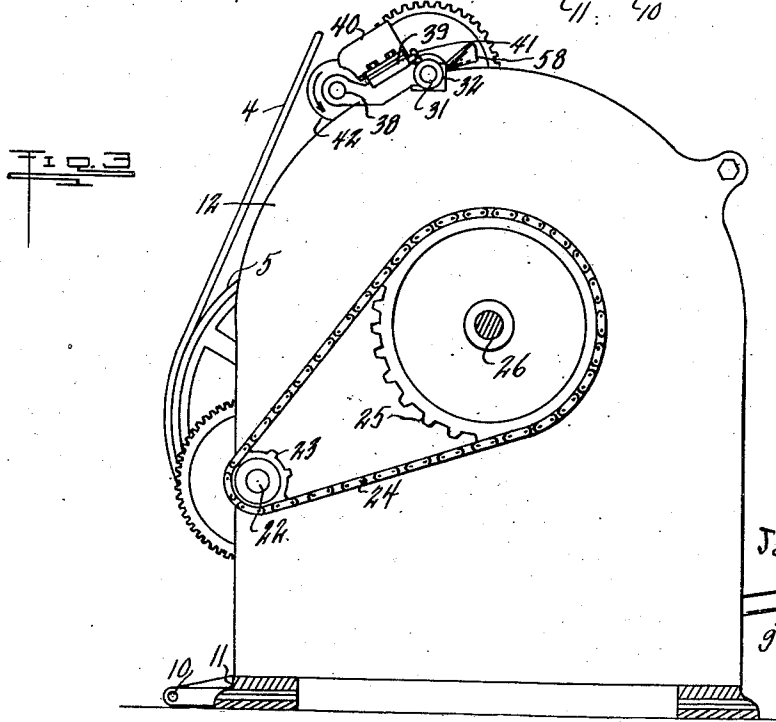
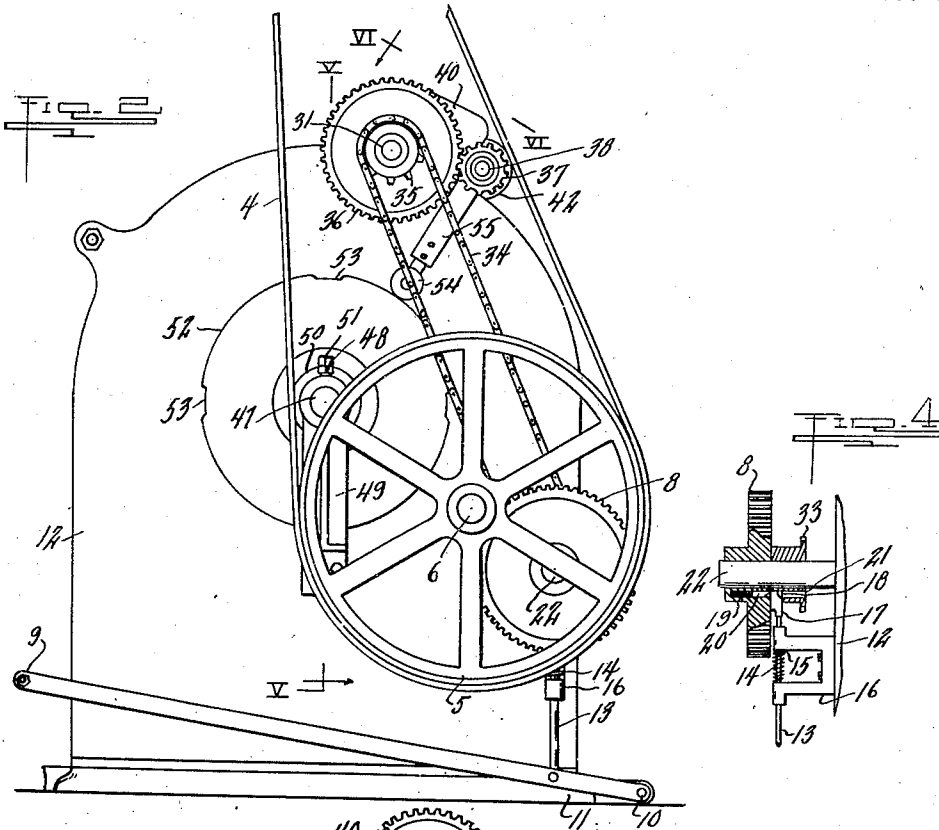
Oct. 16, 1934.

J. R. VAN WORMER
SINGLE SERVICE PACKAGING

1,977,502

Filed May 14, 1928

9 Sheets-Sheet 2



Inventor
John R. Van Wormer
B. J. [Signature]
Attorney

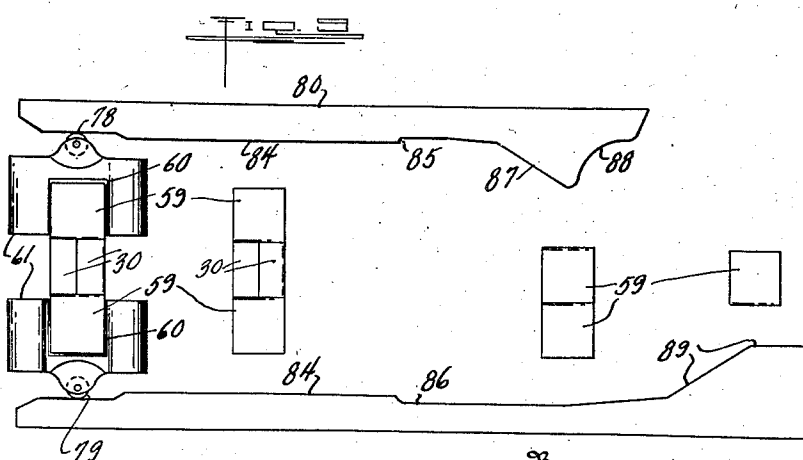
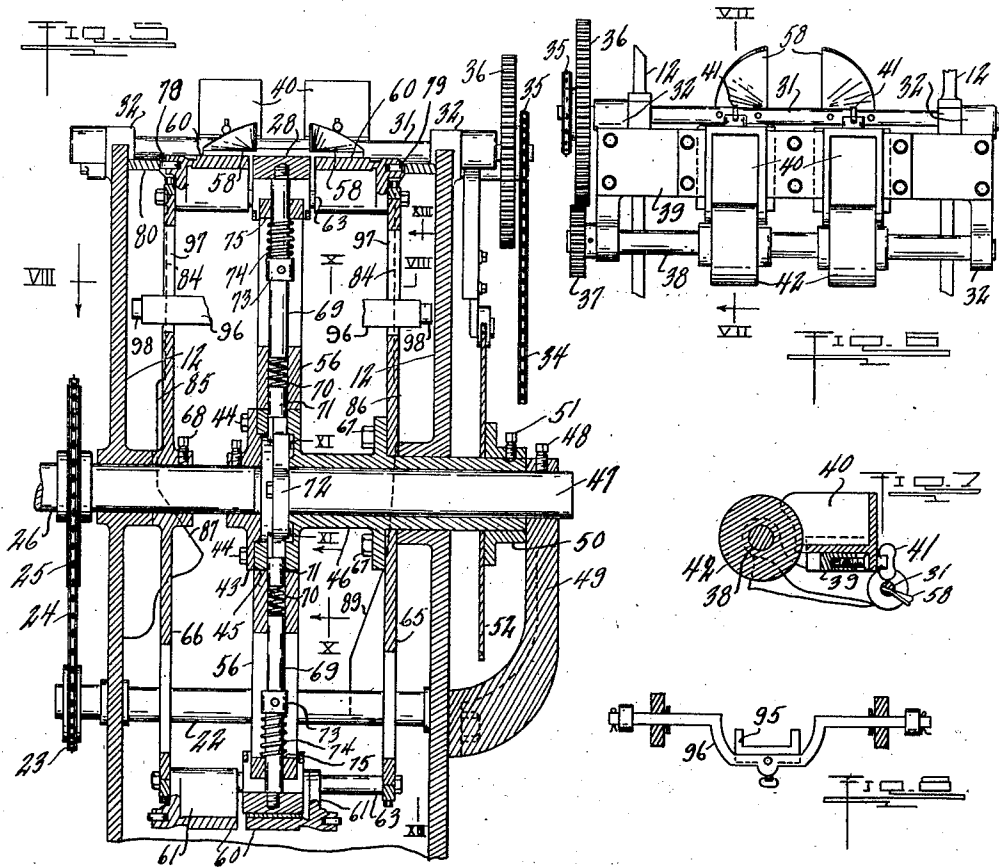
Oct. 16, 1934.

J. R. VAN WORMER
SINGLE SERVICE PACKAGING

1,977,502

Filed May 14, 1928

9 Sheets-Sheet 3



Inventor
John R. Van Wormer

Geo. E. ...
Attorney

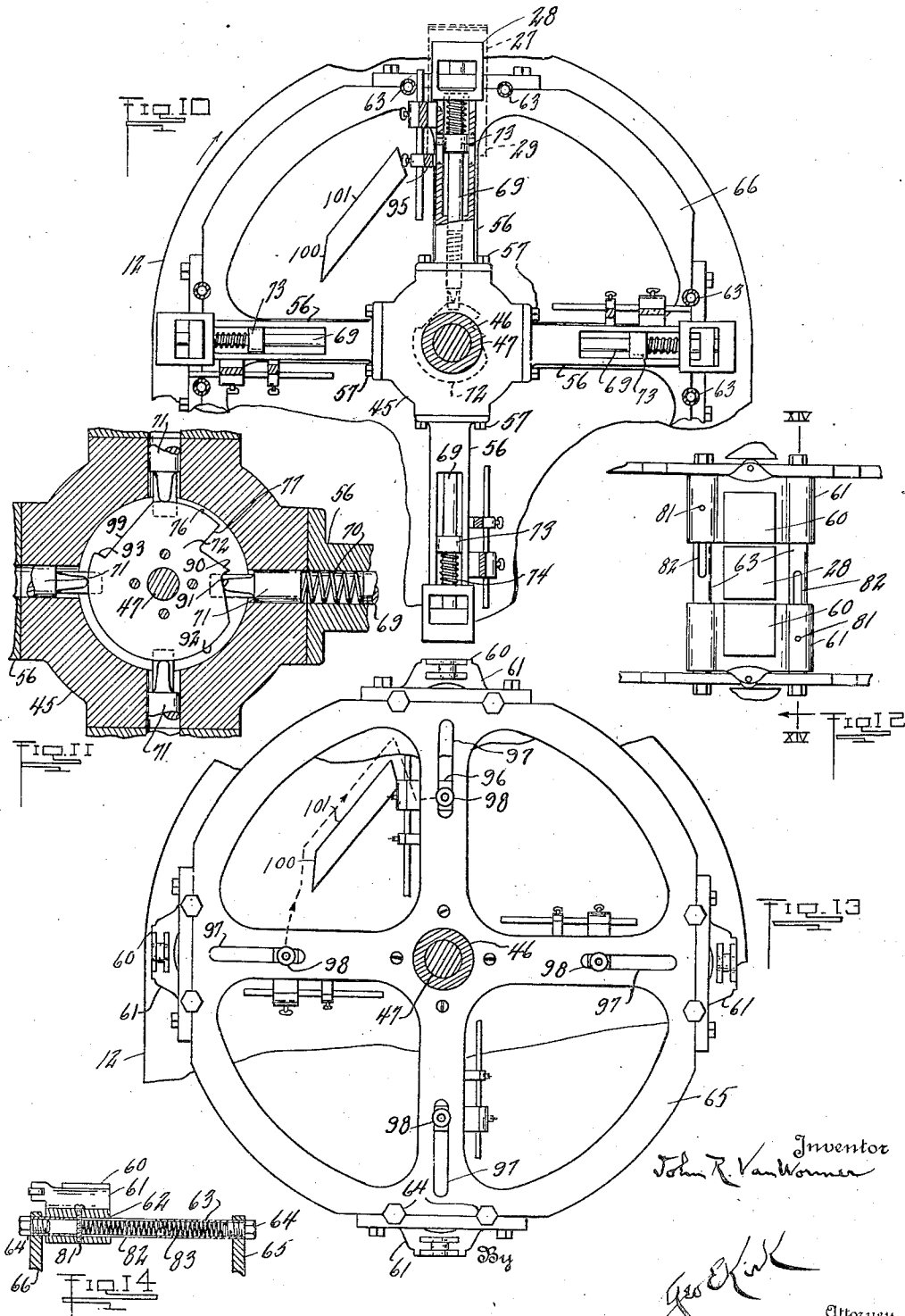
Oct. 16, 1934.

J. R. VAN WORMER
SINGLE SERVICE PACKAGING

1,977,502

Filed May 14, 1928

9 Sheets-Sheet 4



Inventor
John R. Van Wormer

Geo. E. Link
Attorney

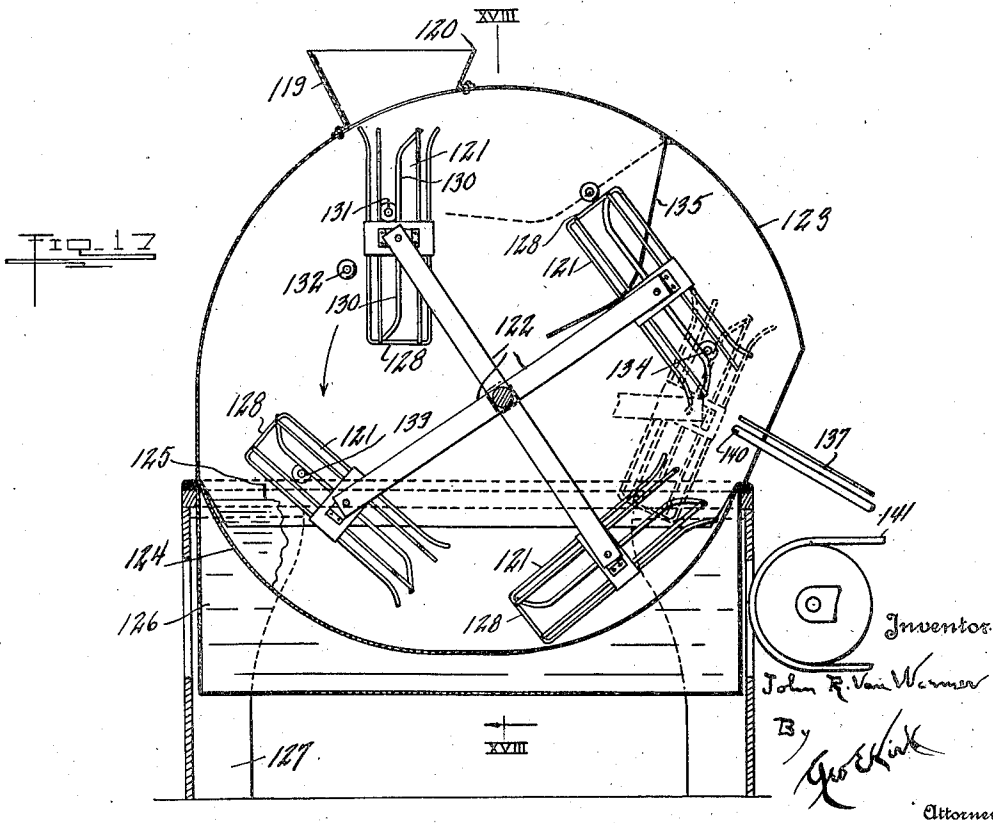
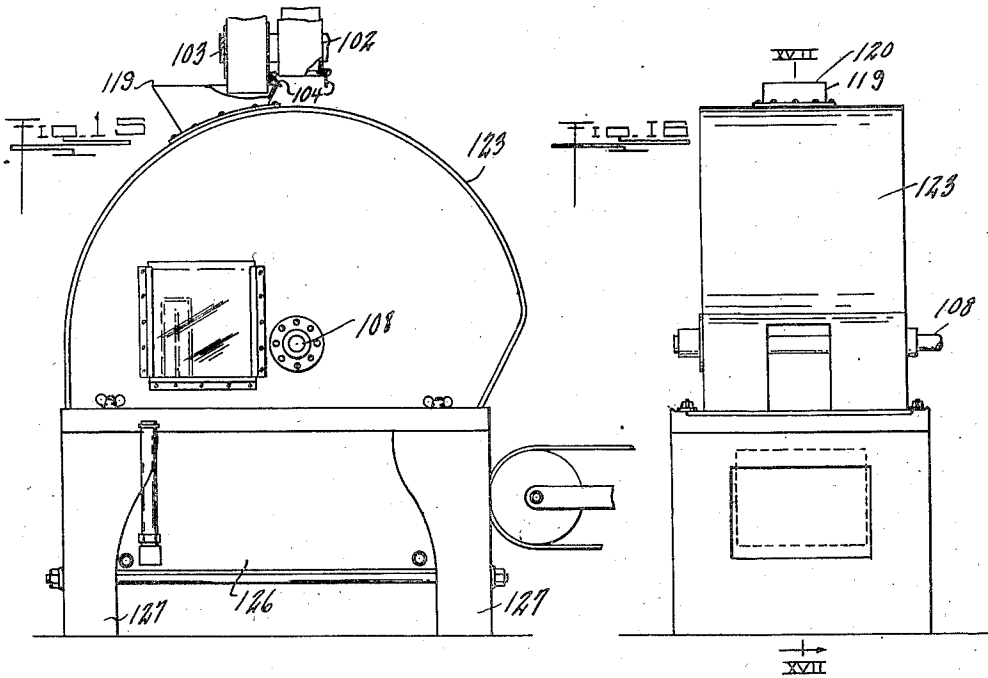
Oct. 16, 1934.

J. R. VAN WORMER
SINGLE SERVICE PACKAGING

1,977,502

Filed May 14, 1928

9 Sheets-Sheet 5



Inventor:
John F. Van Wormer
By
Geo. H. Link
Attorney

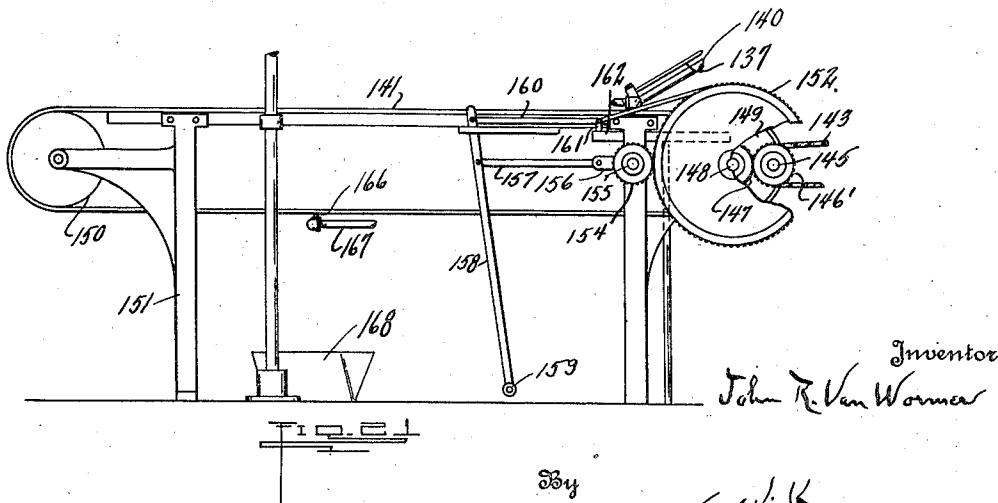
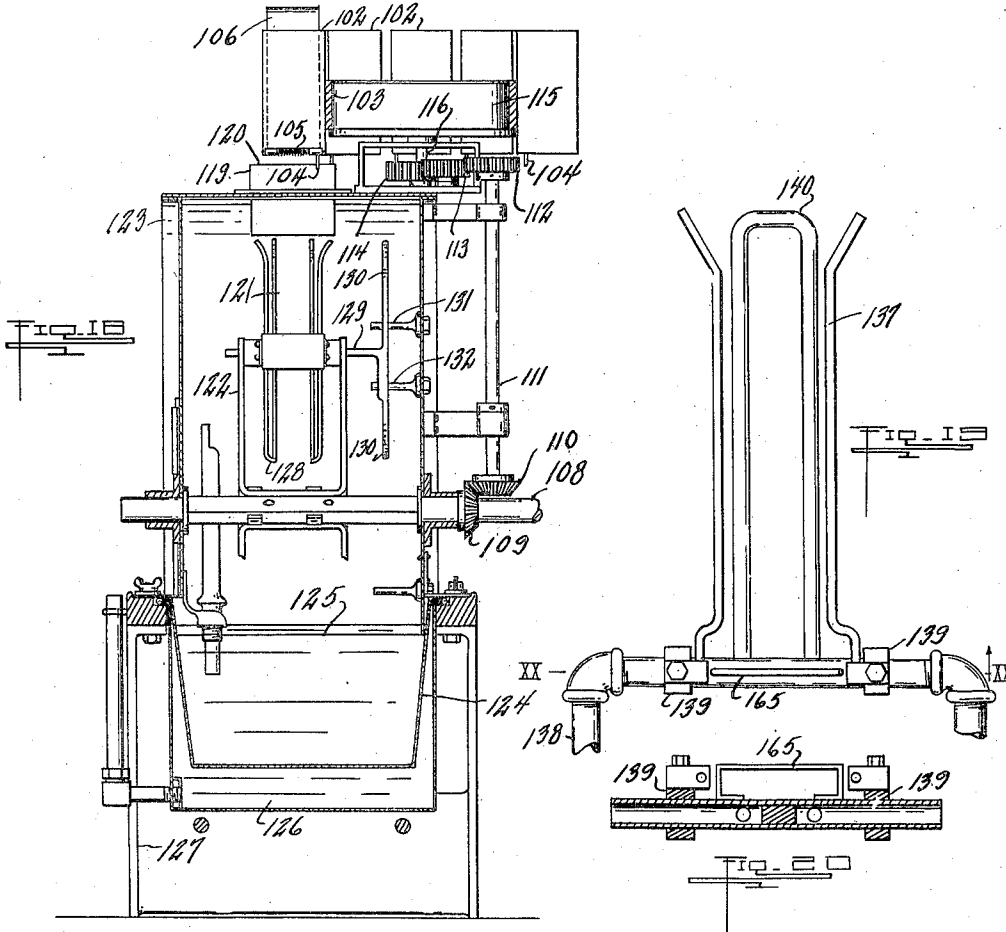
Oct. 16, 1934.

J. R. VAN WORMER
SINGLE SERVICE PACKAGING

1,977,502

Filed May 14, 1928

9 Sheets-Sheet 6



Inventor
John R. Van Wormer

Geo. Kink

Attorney

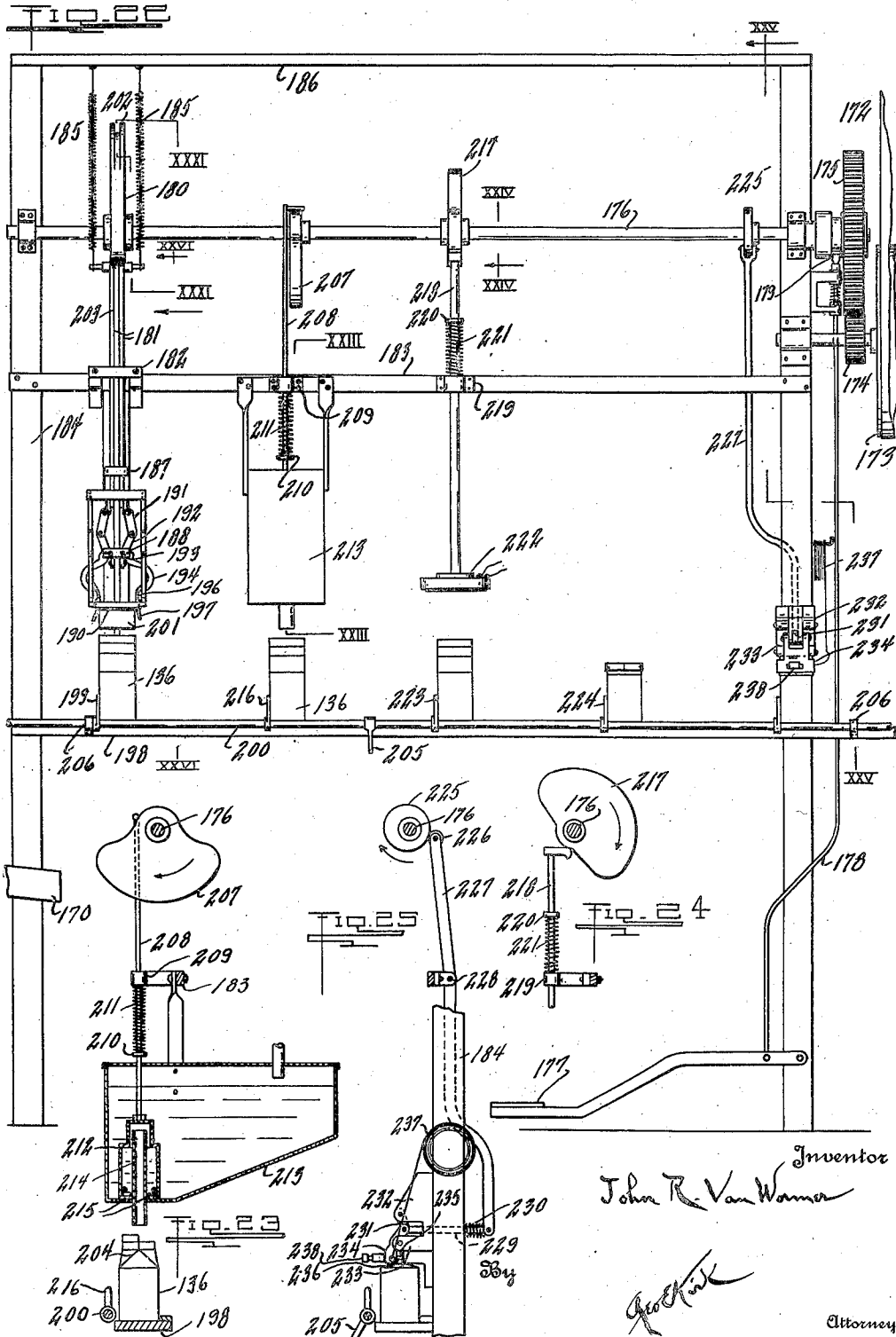
Oct. 16, 1934.

J. R. VAN WORMER
SINGLE SERVICE PACKAGING

1,977,502

Filed May 14, 1928

9 Sheets-Sheet 7



Inventor
John R. Van Wormer

Attorney

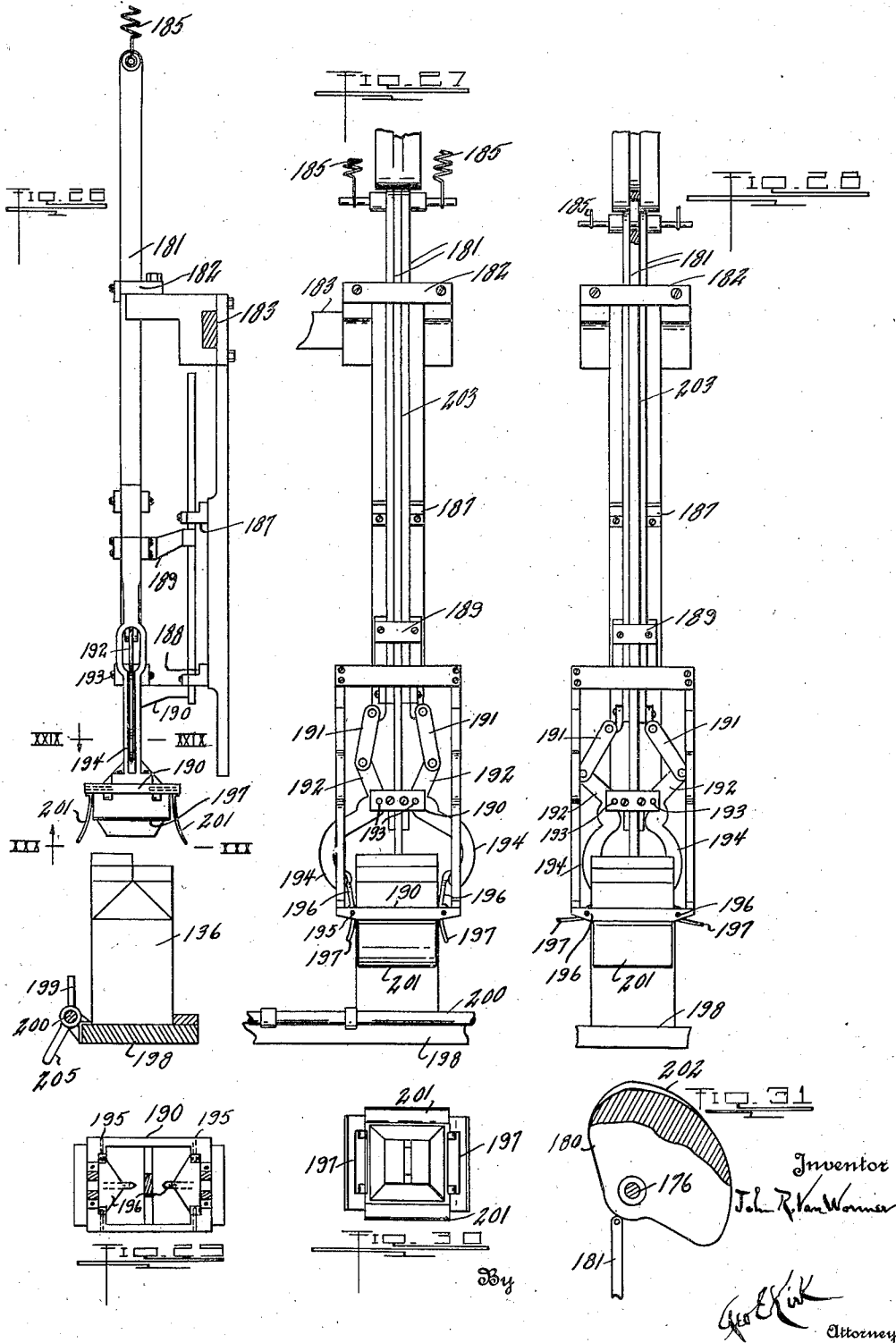
Oct. 16, 1934.

J. R. VAN WORMER
SINGLE SERVICE PACKAGING

1,977,502

Filed May 14, 1928

9 Sheets-Sheet 8



Inventor
J. R. Van Wormer
Attorney

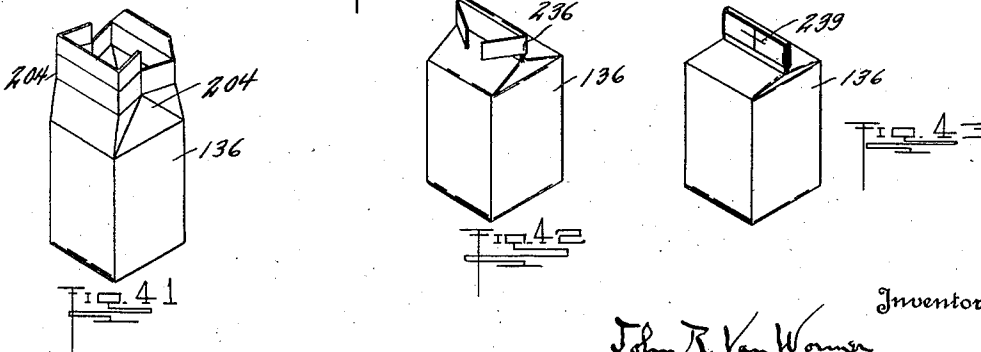
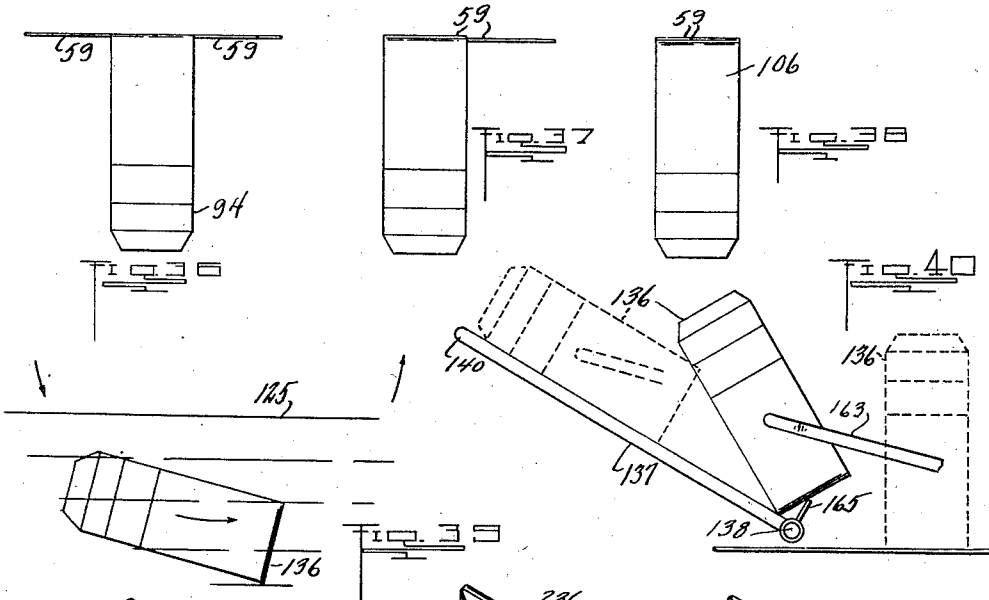
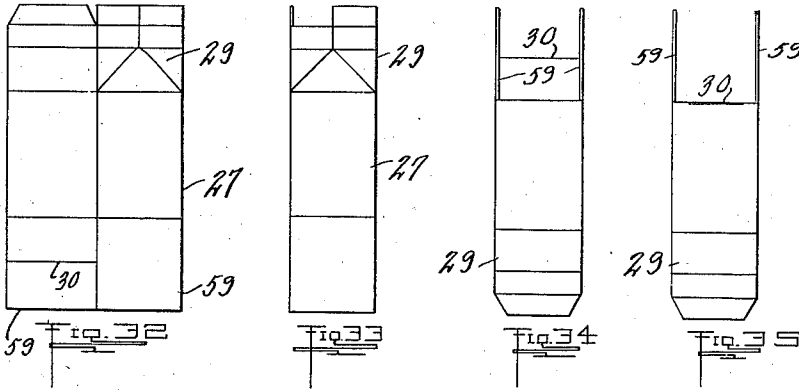
Oct. 16, 1934.

J. R. VAN WORMER
SINGLE SERVICE PACKAGING

1,977,502

Filed May 14, 1928

9 Sheets-Sheet 9



Inventor
John R. Van Wormer

By

Attorney

UNITED STATES PATENT OFFICE

1,977,502

SINGLE SERVICE PACKAGING

John E. Van Wormer, Toledo, Ohio, assignor to
The American Paper Bottle Company, Toledo,
Ohio, a corporation of Ohio

Application May 14, 1928, Serial No. 277,414

19 Claims. (Cl. 93-6)

This invention relates to the preparation for charging, charging or filling, closing and sealing of packages or containers.

This invention has utility as a single-service package, say for fresh milk, as an installation to be operated by a dairyman for one handling of the milk as produced directly into a package for ultimate use of the consumer.

Referring to the drawings:

10 Fig. 1 is a plan view of a single service paper or fiber milk bottle installation for handling the flat blank as set up in open end tube, forming into a one end sealed container with an extension, leak proofing, charging and sealing ready for retail directly from the dairyman, parts being broken away;

Fig. 2 is a side view of the end sealing mechanism of the installation, looking at the mechanism from the right of Fig. 1;

20 Fig. 3 is a section on the line III—III, Fig. 1;

Fig. 4 is a detail view, in partial section, of the control clutch for the end sealing mechanism;

Fig. 5 is a section on the line V—V, Fig. 2;

25 Fig. 6 is a detail view in plan of the adhesive applying device for the sealing mechanism from line VI—VI, Fig. 2;

Fig. 7 is a section on the line VII—VII, Fig. 6;

Fig. 8 is a section on the line VIII—VIII, Fig. 5;

30 Fig. 9 is a projected showing of the bottle folder control cams, the folder in plan, and the sequence of bottle end folding;

Fig. 10 is a section on the line X—X, Fig. 5;

Fig. 11 is a view on an enlarged scale on the line XI—XI, Fig. 5;

35 Fig. 12 is a plan view of the bottle end folder at the first folding position in the bottle folding cycle;

Fig. 13 is a section on the line XIII—XIII, Fig. 5;

40 Fig. 14 is a section on the line XIV—XIV, Fig. 12;

Fig. 15 is a view of the leak-proofing mechanism of the installation from the left of Fig. 1;

45 Fig. 16 is a view of the leak-proofing mechanism from the right of Fig. 15;

Fig. 17 is a section on the line XVII—XVII, Fig. 16;

Fig. 18 is a section on the line XVIII—XVIII, Fig. 17;

50 Fig. 19 is a plan view of the chute for receiving bottles from the leak-proofing mechanism;

Fig. 20 is a section on the line XX—XX, Fig. 19;

55 Fig. 21 is a side view of the take-off conveyor portion of the leak-proofing mechanism for receiving the bottles from the chute of Fig. 19;

Fig. 22 is a front view of the bottle charging and final closing mechanism;

Fig. 23 is a section on the line XXIII—XXIII, Fig. 22;

Fig. 24 is a view on the line XXIV—XXIV, 60 Fig. 22;

Fig. 25 is a section on the line XXV—XXV, Fig. 22;

Fig. 26 is a section on the line XXVI—XXVI, Fig. 22, showing the bottle extension-collapsing 65 device for initiating fold line for the final closure;

Fig. 27 is a front view of the device of Fig. 26, depressed to bottle engaging position from the showing in Fig. 22;

Fig. 28 is a view similar to Fig. 27, showing the 70 device collapsing the bottle extension;

Fig. 29 is a section on the line XXIX—XXIX, Fig. 26;

Fig. 30 is a section on the line XXX—XXX, 75 Fig. 26;

Fig. 31 is a section on the line XXXI—XXXI, Fig. 22;

Fig. 32 is a view of the flat tube or knocked down bottle blank;

Fig. 33 is a side view of the bottle blank in 80 set up or open position as an open ended square tube;

Fig. 34 is a view of the bottle blank from the left of Fig. 33 and oriented ready to be positioned on a block in the end sealing mechanism; 85

Fig. 35 is a view of the blank with the minor bottom flaps folded and the blank in the form as thrust upon the block in the gluer or end sealing mechanism;

Fig. 36 is a view showing the position of the 90 blank in the mechanism for receiving the adhesive on the major flaps of the end to be closed;

Fig. 37 is a view of the blank with one of the glued major flaps folded upon the minor end flaps; 95

Fig. 38 is a view of the blank with the second major flap folded in having received the third complete one-end closure formation of the container or bottle;

Fig. 39 is a view of the bottle being dipped to 100 receive a coating in the leak-proofing bath;

Fig. 40 is a view showing the delivery course of the bottle from the dipping bath of the coating mechanism;

Fig. 41 is a view, in perspective, of the bottle 105 with its closure extension fold lines re-established after the coating;

Fig. 42 is a perspective view of the bottle closure extensions collapsed to bottle closing position; and 110

Fig. 43 is a perspective view of the completed, filled and sealed bottle.

The main drive

5 Motor 1 is connected for continuously operating shaft 2 having pulley 3 connecting drive belt 4 extending to pulley 5 on shaft 6 (Figs. 1, 2). This shaft 6 has fixed therewith pinion 7 in mesh with gear 8 thereby providing continuous rotation for this gear 8. By treadle 9 having fixed fulcrum 10 on base 11 for housing 12, there may be through depressing treadle 9 a pulling down
10 tion for this gear 8. By treadle 9 having fixed fulcrum 10 on base 11 for housing 12, there may be through depressing treadle 9 a pulling down
15 downward movement is directed by bracket 16 carried by the housing 12. This downward pull of the rod 13 and its head 17 to be clear of way 18 thereby permits spring 19 to thrust plunger 20 axially into the seat vacated by the head 19 to connect this gear 8 to companion clutch member or collar 21 fast on shaft 22. There is thus provided one complete rotation for the shaft 22 at each depression of the treadle or lever 9.

This shaft 22 extends through the housing 12 and at its remote end carries sprocket wheel 23 (Fig. 3) from which extends sprocket chain 24 as a speed reduction to sprocket wheel 25 fast with shaft 26 in the housing 12 to give herein a four-to-one speed reduction rate of rotation for the shaft 26. It accordingly follows that at each depression of the treadle 9, there may be a 90° travel of the shaft 26.

Blank set-up and end sealing

25 Collapsed blank 27, (Fig. 32), as a flat article received in compact form by the dairyman, is opened up into rectangular tube (Fig. 33) by the attendant at this end sealer machine. This attendant disposes this set up tubular blank 27 to slide upon block 28 (Figs. 1, 5), with the attendant standing at operator's station adjacent the treadle 9. This thrusting of the tubular blank on the block 28 is with the blank extension 29 down over the tube and the block end in position to have, as to the attendant, the position shown in Fig. 34. The attendant with this blank thrust down on the block 28, collapses similar opposing minor end flaps 30 toward each other over the block 28, thus disposing such in proximity to the end of the block 28. The attendant in thus directing these minor flaps 30 has such in that proximity to the block 28, that there is freedom to ride under non-rotary bar 31 mounted in brackets 32 on the housing 12.

Adhesive applying device

60 Fixed to rotate with the gear 8 loose on the shaft 22 is sprocket wheel 33 (Figs. 2, 4) continuously rotatable and connected by sprocket chain 34 with sprocket 35, fixed with gear 36 and loosely mounted on the rod or bar 31. This gear 36 is in mesh with pinion 37 (Figs. 1, 5, 6) fast on shaft 38 carried by the brackets 32 to pivot on the rod 31. These brackets 32 are connected by plate 39 carrying pockets or glue pots 40 adjustable by screws 41 (Fig. 7) to vary their clearance as to adhesive or glue applying rolls 42 fast on the shaft 38. These rolls 42 are accordingly closures for the respective glue pots 40 and, as rotating relatively thereto on their surface, carry a thin coat of adhesive.

70 Shaft 26, as extending into the housing 12, carries fast therewith flange 43 (Fig. 5) connected by bolts 44 with flange 45 fixed with sleeve 46 rotatably mounted on stub shaft 47 held by set

screw 48 in bracket 49 fixed with the frame or housing 12. It is thus seen that shaft 47 is non-rotary and provides a bearing for the sleeve 46. This sleeve 46, adjacent the bracket 49, carries collar 50 held by set screw 51 against rotation relatively to the sleeve 46. This collar 50 is accordingly angularly adjustable relatively to the sleeve 46 and has fast therewith cam disk 52 having seats 53 (Fig. 2). Roller 54 rides on this disk 52 and is carried by extension 55 from a bracket 32. The extension 55 is of such length that normally the shaft 38 is positioned as the roller 54 is on the cam 52 to hold the rolls 42 clear of operative position. However, as the roller 54 rides into cam depression 53, the glue carrying rolls 42 then swing radially inward and are in operative position.

With the block 28 approaching upper position, the operator may charge a tubular blank 27 on the block 28 with the minor flaps 30 directed over the end of the block 28. From this charging station there is travel of the carried block 28 ninety degrees (90°), for this block 28 is directed by arm 56 connected (Figs. 5, 10) by bolts 57 to the flanges 43, 45. In this travel, wings 58 spread major flaps 59, from radially extending position as to the shaft 26 and from parallel relation (Fig. 35) to spread relation (Fig. 36), against raised portions 60 (Figs. 5, 12, 14) on members 61 having bearings or tubular openings 62 mounted on tubes 63 anchored by nuts 64 in spiders 65, 66. The spider 65 is connected by bolts 67 with the sleeve 46 (Fig. 5). The spider 66 is connected by set screw 68 with the shaft 26. It thus follows that these raised pads 60 travel angularly with the shaft 26, and the block 28 and in this travel, at the position where the disk cam 52 has depression 53 register with roller 54, the glue rolls 42, by gravity, swing radially inward upon rod 31, as an axis, to contact the flaps 59 on the radially outward side and thus coat such flaps with the adhesive, due to the relative rotation of these rolls 42 as to the flaps 30.

Folding

120 The block 28 is provided with stem 69 guided in tubular arm 56 (Fig. 5) and engaged by compression spring 70, the compression of which is determined by plunger 71 as acted upon by stationary cam 72 carried by the non-rotary shaft 47. This stem 69 has fixed thereon collar 73 against which engages compression spring 74 in open-work region of the arm 56 abuts outer terminus 75 of open-work region in the arm 56. This spring 74 is stronger than the spring 70 and accordingly normally retains the block 28 retracted against the action of the cam 72, but on the operation of the cam 72 for outward thrust, there is such compression of the spring 70 as will locate this block in the desired radial position at the charging stage approximately flush with the pads 60.

135 In the travel from this charging position, clockwise, (Fig. 11) cam 72 has portion 76 hold the block 28 in this flush position until after the gluing means or rollers 42 have acted, then depression 77 in the cam 72 allows the head or block 28 to be retracted by the spring 74 radially inward. This deflects slightly outwardly both of the flaps 59. The members 61 (Fig. 9) are provided with rollers 78, 79. Cam 80 coacting with the roller 78 allows freedom of the pad and member 61 as to the block 28, for the member 61 carries pin 81 extending through slot 82 in the tube 63 (Fig. 14), there to be engaged by compression spring 83

normally thrusting a roller 78 or 79 against the cam 80 effective in its cooperation with said roller, to shift the member 61.

At the gluing stage, before the head 28 has withdrawn inward, cam portions 84 coast with rollers 78, 79, bringing the members 61 into proximity to the blank tube on the block 28. Past the gluing operation, there is release from this held position by cam portions 85, 86. The roller 78 from cam portion 85 travels on cam portion 87 toward and under a partially raised flap 59, thus effecting folding of such flap 59 over the pair of flaps 30 (Fig. 9). As this operation is completed, cam portion 88 retracts this folder element or support 61 and cam portion 89 coacts with roller 79 for thrusting companion member 61 toward the depressed block 28 to fold the second flap 59 over the first flap 59 in thus completing the end closing sealing operation.

This roller 79 in coacting with cam portion 89, holds this second, and accordingly both of the flaps 59 in the sealing position for converting this open end tubular blank into a one-end-sealed container.

At the peak position for the cam 87 in effecting folding of the first flap 59, the roller 78 as locating the support 61 in this folding position, is over the block 28, and cam portion 90 (Fig. 11) of the cam 72 thrusts this block 28 radially outward into compacting position, in supplementing the sealing action of the support 61 on the first flap 59. Thereafter, cam portion 91 allows the block 28 to be depressed slightly during the period that the cam portion 88 is effective. At the region for the cam portion 89, this cam 72 has cam portion 92 as a holding means for snugly compacting the pair of major flaps 59 against the folded minor flaps 30 in the holding sealed during the travel back toward charging position, where this cam portion 92 terminates in cam portion 93 in releasing the block 28.

Ejector

In the charging of the tubular blank on the block 28, the inward distance of the blank as to its extension 94 (Fig. 36) about stop 95 (Figs. 8, 10, 13). This stop 95 is a set screw adjusted ledge carried by cross head 96 extending into slots 97 of the spiders 65, 66. This cross head 96 extending into slots 97 of the spiders 65, 66, terminally carries rollers 98, which, in the region from cam portion 93, along cam portion 99 (Fig. 11) of the cam 72, coast with guide 100, 101, (Figs. 10, 13) fixed with the housing 12, thus moving this ledge 95 radially outward along the block 28 and thrusting the one end sealed container outward, radially off the block 28, so that the operator may readily remove upwardly such completed container and supply in its stead a tube blank for a repetition of this cycle of operations in the four stages of this intermittent drive as herein, such stages being from the upper charging 90° clockwise (Fig. 10) to the first flap sealing as a first stage; directly in passing therefrom there is the second major flap sealing as the second stage; and third and fourth stages as the holding for allowing the glue or sealing means to set.

Coating mechanism

The operator in taking the one-end-completed blank from the gluing mechanism, deposits such from the operator's station near the treadle 9 in rectangular tubular pocket 102, open ended above and below. These pockets 102 are carried by endless belt 103 (Fig. 1). Each of these pockets 102

(Figs. 1, 15, 18) has trigger 104 normally actuated by torsion spring 105 to limit the descent of one-end-closed blank 106 thereinto. This endless conveyor 103 is shown as having a drying or hardening section for the glued or just-formed container 106 as a time interval. This conveyor 103, as actuated in synchronism with the end gluing mechanism for shaft 26, is connected by coupling 107 with shaft 108 upon which is mounted bevel pinion 109 in mesh with bevel pinion 110 on vertical shaft 111 carrying spur gear 112 in mesh with intermediate gear 113 coacting with gear 114 fixed with roller 115 mounted on fixed vertical shaft 116. This roller 115 is the live roller for the conveyor 103, which conveyor 103, from the roller 115, passes about idler roller 117 on vertical shaft 118.

This conveyor as conducting the containers 106 from about the roller 117 (Fig. 1) for a glue hardening or seasoning operation, brings these containers step by step to chute 119 having cam edge 120 coacting with the depending trigger 104 (in travel to the left, Fig 15) to shift such clear of closure position for the bottom of the pocket 102 as coming into position at the chute 119. The container 106, thus drops closed end downward through the chute 119 (Fig. 17) into open work pocket 121 (Fig. 17) carried by arm 122 fast on the shaft 108. This device rotates step by step counter-clockwise in housing 123 having therebelow leak-proof-coating bath chamber 124 herein shown as charged with molten paraffin 125, the molten condition of which is maintained by hot water jacket 126 disposed in base 127 as carrying the housing 123. The arms 122, besides carrying the open work pockets 121, which pockets 121 have closed ends 128, are provided with arms 129 having opposite extensions 130. These arms, laterally of the pockets 121, coast, from positioning the pocket adjacent the chute 119 as held by a pin 131, to partially tilting the pocket 121, as containing a container 106 in passing from each position.

Full orienting of the pocket is prevented by pin 132, so that, as the counter-clockwise movement of the arm 122 continues, the pocket 121 is directed, with its closed end 128 upward, into the bath of molten paraffin 125. This position is a dipping position for the open end of the container 106 to scoop thereinto molten paraffin as the container shifts through the bath, this travel being directed by fixed pin 133 coacting with the extensions 130. The continued movement of the arm 122 swings the pocket, with its container 106 therein loaded with a quantity of the paraffin, upward out of the bath. In this ascent, pin 134 engages the rod 130 and tilts the pocket 121 to orient the open end of the container downward for slopping out of the container the scooped-up charge of the molten paraffin, for flowing back into the bath 124. In this ascent, through the open work closed end 128 of the pocket 121, spring 135 is effective yieldably for urging this paraffin dipped or leak-proof-coated container 136 out of the pocket 121 upon chute 137 (Figs. 18, 19, 20, 21). Hot water circulation pipes 138, through bearings 139 and return bend 140 adjacent the chute 137 maintain a softening temperature for the leak-proofing substance, so that the coated container 136 as striking the chute 137, 140, freely slides down such incline, to be deposited upon conveyor 141.

Leak-proofing take off

The congealing nature of the leak-proof coating has adhesive tendency and in order to avoid

any clogging of the apparatus, means are taken to insure removal of the coated container 136 from this leak-proofing mechanism. Fixed with the shaft 108 is sprocket wheel 142 (Fig. 1) from which extends sprocket chain 143 to sprocket wheel 144 on shaft 145 carried by bracket 146. This shaft 145 has fixed thereon pinion 146' in mesh with pinion 147 fixedly mounted outward from the conveyor frame on horizontal shaft 148 (Figs. 1, 21) carrying within the frame a pulley 149 as the live or driving pulley for conveyor 141. This conveyor 141, remote from the pulley 149, passes about pulley 150 carried by bracket 151 on the conveyor frame. This conveyor is accordingly given a step by step rotation in synchronism with the gluing mechanism as well as the coating mechanism.

Fast with the shaft 148 is gear wheel 152 in mesh with pinion 154 on shaft 155. This shaft 155 extends (Fig. 1) past the conveyor 141 transversely and there carries arm 156 from which extends link 157 (Figs. 1, 21) to lever 158 having fixed fulcrum 159. From this lever 158 extends link 160 to pin 161 as directed by centrally countersunk rhomboidal cam 162. From this pin 161 is spring extension 163 inwardly extending from beyond the link 160, duplicate of which mechanism is on opposite sides of this upper reach of the conveyor 141.

In the step by step rotation of the shaft 155, the pins 161 ride along the outer sides of cams 162. These pins then approach each other as directed by the inclined sides of the cam 162 toward the shaft 148 (Fig. 1) and cause the yieldable arms 163 (Fig. 40) to engage the coated container 136 slightly above its center of gravity, and thus in the cycle of rotation of this shaft 155 with the pins 161 traveling away from the shaft 148 along the inner portions of cams 162 and directed by spring fingers 164, grip this container 136 for hauling it off the coating machine and wiping the bottom of such container across scraper wire 165 (Figs. 19, 20, 40).

At the cycle of the single complete operation of the rotation of the shaft 155 in its four-to-one speed-up relatively to the shaft 108, the pins 161 come to diverging portions of the cams 162 and are clear of the springs 164, thus causing the pins 161 to move outwardly from the conveyor 141, with the yieldable arms of springs 163 releasing the set-up coated container 136 on the conveyor belt 141. This conveyor belt is of a length to the pulley 150 sufficient to allow the paraffin coating material to congeal. This conveyor 141 in its return reach on the under side is contacted by wire scraper 166, adjacent hot water line 167 for removing any excess of the coating material so that such may be deposited in vessel 168 therebelow. Thus the conveyor belt 141 is maintained clear of coating accumulation, so that the articles may not freeze there-to or be tilted in the shifting of the articles therealong. The articles accordingly as traveling along the conveyor 141 come to chute 169 and there accumulate in receptacle 170 (Fig. 1).

Charging and final closing

From drive shaft 2, pulley 171 is connected by belt 172 to pulley 173 having speed reduction gearing connection 174 to gear 175 as continuously rotating and mounted on shaft 176 (Figs. 1, 22). At the second operator's station, treadle 177 may be depressed to operate rod 178 and thus release clutch 179 similar to the clutch at the gear 8. This permits the gear 175 to operate the shaft 176 one complete rotation.

Bottle extension closure partial collapse

Mounted on this shaft 176 is cam 180 (Figs. 22, 31). This cam coacts with pair of spaced bars 181 as directed by guide 182 carried by cross bar 183 of frame 184, for descent against the resistance of tension springs 185 carried from overhead bar 186 mounted by the frame 184. These bars 181 extend past the guide 182. Extensions 187, 188, are fixed guides for guide rod 187' fixed with cross-head 189, 190 (Figs. 28, 27, 28). These bars 181 extend respectively to links 191 connected to arms 192 of levers having fulcrum 193 and extensions 194 therebelow. The cross-head 190 has, in opposing relation pivotal mountings 195 and upwardly extending V-tongues 196 (Fig. 29) engaged by the inwardly disposed free ends of the arms 194 of angle levers 192, 194. These pivotally mounted, upwardly extending, V-tongues 196 have depending loaded lower portions 197 tending normally to hold these tongues 196 in slightly diverging upward position from the pivotal mountings 195.

The operator at the station of the treadle 177 may remove container 136 from the receiver 170 and place such on platform 198 (Figs. 1, 22) in position below the cross head 190 and abutting finger 199 on rod 200. The depression of the pedal or treadle 177 thus starting the shaft 176 for a full rotation, lowers this cross-head 190 into position to bring the tongues 196 in opposing relation adjacent opposite extension portions 201. Furthermore, rotation of this shaft 176 brings cam portion 202 to coact with intermediate rod 203, thus shifting such rod relatively to the bars 181 between which bars 181 the rod 203 is guided, so that there is a rocking of the angle levers 192, 194, to swing the tongues 196 toward each other and thus re-establish the crease lines for folding in the end closure extensions, which lines have been given rigidity by the coating operation. The container entering element is indicated at 203', being secured to the lower end of rod 203, and this element co-operates with the V-tongues 196 in re-establishing the crease lines by interiorly supporting the container walls. This means there is thus initiated a partial collapse extension 204 of the container 136.

The completion of the shaft rotation after this initiating of the extension collapse results in so disposing the cams 180, 202, that the shorter radius portion is downward and the springs 185 may effect recovery or ascent of the breaker device clear of the container 136 so that the attendant may grasp handle 205 and slide the rod 200 in bearings 206 to the right, thus shifting the extension re-established fold line container 136 clear from its position under the breaker to a second position along the platform 198. As so disposed, the shaft 200 may be rocked to clear the finger 199 from the line of the platform 198 and the rod 200 shifted to the left to the initial position.

Filler

The shaft 176 is shown as equipped with cam 207 (Figs. 22, 23) coacting with rod 208 as directed by guide 209. This rod 208 carries fixed collar 210 against which acts spring 211 for urging cylinder 212 downward in reservoir 213 about tubular discharge tube 214. This cylinder 212 is equipped at its lower region with check valve 215 freely opening for flow of milk into the cylinder 214 and closing against outflow. A measured volume of milk is thus charged into the res-

ervoir container 213 by way of pipe 214 for maintaining a level of such liquid therein. The ascent of this cylinder 212 lifts the measured quantity of liquid in the cylinder 212 and allows such to over-flow through the tube 214 into the container 136 therebelow. Completion of the rotation of the shaft 176 and the cam 207 allows the cylinder 212 to be relocated in its lower position and thus descend to be refilled with its major quantity of liquid in this filler for second charging operation.

The handle 205 is again given the single cycle of operation for shifting the charged container 136 from the filling station by the action of finger 216 similar to the finger 199.

Coating melting for final sealing

The shaft 176 carries cam 217 (Figs. 22, 24) effective to depress rod 218 as directed by guide 219. This rod 218 has fixed thereon collar 220 with which coacts compression spring 221 normally holding this rod 218 elevated against the cam 217. This rod 218 in its lower region carries jacketed electric resistance energized by electric current connection thereto (not shown). This resistance provides heating element 222 as a warmer for softening the adhesive as coating the extension 204 of the container 136. This softening or partial melting of the paraffin coating on the container 136 brings about a condition so that the operator after this heater 222 has ascended, may again operate this rod 200 through the handle 205 for causing finger 223, similar to the finger 199, to shift from third station to fourth station on the platform 198. At this position there may be final closing operation mechanically or, as herein disclosed, by the operator, and the operator's action at this station is shown as in order. The extensions are thus brought into fully collapsed and primary sealing position (Fig. 42) with the softened paraffin creating adhesive condition so that the full closure of the vessel is thus attained. From this fourth station the closed container may be abutted by finger 224 on the shaft 200 for shifting to a fifth station, or additional station.

Final sealing closure

The shaft 176 is provided with cam 225, herein shown as of general eccentric form (Figs. 22, 23). Coacting with this cam 225 is roller 226 on lever 227 having fixed fulcrum 228. Depending arm of this lever 227 has rod 229 pivoted therefrom surrounded by compression spring 230 tending normally to tilt this lever to hold the roller 226 against the cam 225. This rod 229, as directed by the frame 184 through which it extends, terminates in toggle 231, upper link of which is mounted in bracket 232 carried by the frame 184. The lower link of this toggle is confined by bracket 233 with lever extension 234 therefrom in opposition to abutment 235 carried by the frame 184.

This abutment 235 and extension 234 form a pair of opposing jaws which receive therebetween upwardly extending rib 236 of the collapsed extension or upper end closure for the bottle 136. Accordingly, in the rotation of the cam 225, the lever 227 is rocked against the resistance of spring 230 for effecting through the toggle 231 shifting of the movable jaw 234 toward the abutment 235 for squeezing the rib or tongue 236 therebetween in a final clamp holding. One of these jaws, herein shown as the movable jaw 234, is provided with sticher device or stapling machine for taking wire from spool 237 and by means of plunger 238 operated from mechanism movable relatively

to the jaw 234, effect stapling operation through the extension 236 in forming stitch 239 (Fig. 43). This stapling or wire stitching device may be of a general form, say as shown in Patent 1,113,879, Craig, Oct. 13, 1914.

Operation

It is accordingly seen that hereunder there may be effected from the receiving of knock-down containers, the preparation of such containers for sealing and sealing into the containers of a substance herein shown as fresh milk to be supplied to the ultimate consumer. Two attendants may operate this device, one at the treadle 9 for opening up the flat blank 27 into tubular form and thrusting such blank down upon the block 28, there to have end flaps 59 glued and sealed thereagainst. Such container 106 is removed from the block 28 as another tube is charged thereon. The removed container is placed in pocket 102 of conveyor 103 conducted for a drying period and then automatically discharged into the coating machine, there to have paraffin dipping, then conveyed by conveyor 141 into proximity to the station of the second operator, where the article may be in the maintained synchronism of the machines against excessive accumulation.

This operator may locate the completed milk bottle container in position for breaking of the coating rigidity to reestablish the initial creasing or end closure collapsing condition. The procession or sequence of these containers in these step by step operations brings this collapsed extension container into position for charging; then to have adhesive condition producing melting down of the coating; primary sealing of the final end closure; then full or complete sealing; and even stitching, if such be desired, with the article as thus completely sealed and in the container shifted further along the platform 198 for deposit in cartons or other means of delivering to the place of storage or transit.

What is claimed and it is desired to secure by Letters Patent is:

1. The method of charging a leak-proof container comprising forming a container by setting up a flat blank into an open end tubular form, closing an end of said form and leaving an extension at the other open end having fold defining lines thereon, leak-proof coating said container with the one end closed, and scraping excess coating material off from said closed end.

2. In a container handling apparatus, a holder for a container having an open end extension, including a member for entering the container open end, and fold defining means for the extension embodying a pair of container embracing means movable toward the holder and a member movable relatively to the embracing means for partially collapsing the open end extension along fold defining lines, and actuating means for withdrawing the engaging means and member to leave the container end open.

3. In a container handling apparatus, a holder for a container having an open end extension, and fold defining means for the extension, embodying an embracing frame, means for positioning said embracing frame to have a portion thereof about the container at the junction of the extension and the container body, a first pair of members mounted by the frame and movable toward each other in pushing opposite sides of the extension toward each other, a second pair of members, means thereafter effective for operat-

ing the second pair of members by pushing the connecting sides of the extension inward, and releasing means for withdrawing the frame and members from the open end container.

5 4. In the method of packaging material in leak-proof containers those steps which consist in forming a container by setting up a flat blank
10 into an open end tubular form, closing an end of said form and leaving an open end extension at the other end having fold defining lines
15 thereon, leak-proof coating the container, redefining said fold lines, charging the container with material, closing the open end by folding on the redefined fold lines, and reestablishing an
unbroken leak-proof coating at the last mentioned end.

5. In container handling apparatus, a holder for a container having an open end extension and fold defining means for the extension
20 embodying container end entering means, a pair of opposed pivotally mounted container engaging members adapted to engage opposite sides of the container at the base of the open end extension, and actuating means for rocking the members
25 toward the container entering means in defining open end extension folding lines.

6. In container handling apparatus, a holder for a container having an open end extension, including a member for entering the container
30 open end, and fold defining means for the extension embodying container engaging means including a pair of opposing elements and pivotal mounting means for the elements, and actuating means for shifting the mounting means toward
35 the holder to locate the elements for there rocking on said mounting means against the container open end extension for partially collapsing the open end extension along fold defining lines.

7. In container handling apparatus, a holder for a container having an open end extension, fold defining means for the extension embodying
40 a pair of container engaging elements, and pivotal mounting means for the elements movable toward the holder to locate said elements for
45 there rocking on said mounting means against the container open end extension in defining open end extension folding lines, there being control means for withdrawing the mounting means
50 and elements to leave the container end open.

8. In an apparatus of the class described, a support for a container having an open end extension, fold defining means providing a pair of
55 parallel bearings, one on each side of the container, rockable elements in said bearings, container open end entering means, and means for actuating said elements toward the container entering means therebetween to define folding
60 lines in the open end extension and partially collapse the same along said fold lines.

9. In an apparatus of the character described, a support for a container having an open end extension provided with fold defining lines on
65 opposite sides thereof, means providing a pair of parallel bearings, rockable elements in the bearings engaging the container for partially collapsing the open end extension along the fold defining lines thereof, container open end entering
70 means, and means for actuating said elements to move the same toward the container open end entering means therebetween and into engagement with the container.

10. The method of packaging materials in sealed, self-supporting containers which comprises forming a container of relatively stiff pa-

per having a scored foldable end extension, leak-proof coating said container, including the extension, re-establishing the score or crease lines of the end extension, charging the container with material and, upon closing, establishing an unbroken leak-proof coating at the end just closed.

11. The method of packaging liquids or other materials in self-supporting containers which comprises folding a pre-scored blank fabricated of relatively stiff paper into the form of a flat-walled container having an open end and a scored foldable closure portion at that end, coating the container with a leak-proofing substance in liquid form and permitting said substance to harden or congeal, redefining the score lines of said closure portion after the application of said coating substance, and closing the container by folding said closure portion along the score lines as redefined.

12. The method of packaging liquids or other materials in self-supporting containers which comprises folding a pre-scored blank fabricated of relatively stiff paper into the form of a container having an open end and a scored foldable closure portion at that end, coating the container with a leak-proofing substance in liquid form and permitting said substance to harden or congeal, redefining the score lines of said closure portion after the application of said coating substance, and closing the container by folding said closure portion along the score lines as redefined, the coating substance upon the closure portion being maintained in softened condition during the closing operation.

13. The method of packaging liquids or other materials in self-supporting containers which comprises folding a pre-scored blank fabricated of relatively stiff paper into the form of a container having an open end and a scored foldable closure portion at that end, coating the container with a leak-proofing substance in liquid form and permitting said substance to harden or congeal, redefining the score lines of said closure portion after the application of said coating substance, charging the container after redefinition of the score lines, and closing the container by folding said closure portion along the score lines as redefined.

14. Apparatus for partially closing the foldable end portion of an open-ended container comprising means for supporting a container, a member movable toward the support and into the container through said foldable open-end portion, and mechanism, bodily movable relatively to said support, for acting upon and inwardly deflecting the foldable end portion while said member is positioned within the container and interiorly supporting the wall thereof.

15. Apparatus for partially closing the foldable end portion of an open-ended container comprising a member adapted to be inserted into the container through said foldable open-end portion, mechanism positioned exteriorly of the container for acting upon and inwardly deflecting the foldable end portion while said member is positioned within said container and interiorly supporting the wall thereof, and means for moving said member into the container and withdrawing it therefrom after said mechanism has effected partial folding of said end portion.

16. Apparatus for partially closing the foldable end portion of an open-ended container comprising means for supporting a container, a member movable toward the support and into the con-

80

85

90

95

100

105

110

115

120

125

130

135

140

145

150

tainer through said foldable open-end portion, and mechanism, bodily movable relatively to said support, for acting upon and inwardly deflecting the foldable end portion while said member is positioned within the container and interiorly supporting the wall thereof.

17. The method of partially closing the end of an open-ended container having a bendable wall and a foldable end portion which comprises inserting a wall supporting means thereinto through said open end, inwardly folding the said end portion while said means is in wall supporting position, and removing said means from the container by withdrawing it through the partially folded end portion.

18. The method of packaging liquids or other materials which comprises folding a pre-scored blank of relatively stiff paper into the form of a container having an open end with a scored foldable closure portion at that end, coating the container with a leak-proofing substance in liquid form and permitting said substance to harden, redefining the score lines of said closure portion after the application of said coating substance and hardening thereof, and closing the container

end by folding the said closure portion along the score lines as redefined.

19. The method of packaging liquids or other materials in self-supporting containers which comprises folding a pre-scored blank fabricated of relatively stiff paper into the form of a container having a closed end, an open end, and a collapsible extension at the open end, said extension being divided by score lines into a plurality of hingedly connected flat panels relatively foldable along said score lines, coating the partially completed container with a leak-proofing substance in liquid form and permitting the said substance to harden or congeal, charging the container, and closing and sealing the same by collapsing the pre-scored and coated extension by relatively folding the panels along the coated score lines while maintaining the integrity of the several panels, portions of the previously coated leak-proof coated panels being brought into mutual engagement by such folding operations to effect a seal, and securing said folded panels to maintain such portions in sealing contact.

JOHN R. VAN WORMER. 100

30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150