

Oct. 20, 1959

M. J. LAWRENCE
CARTON SET-UP MACHINE

2,909,105

Filed Oct. 3, 1957

4 Sheets-Sheet 1

Fig. 1.

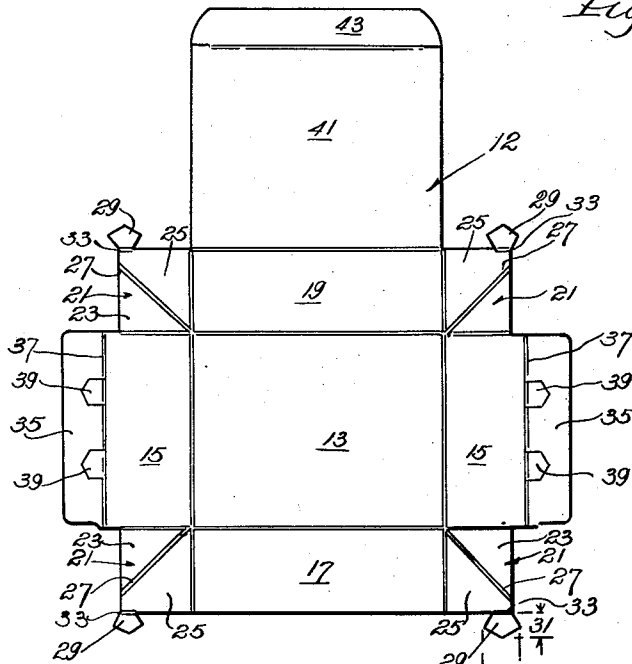


Fig. 2.

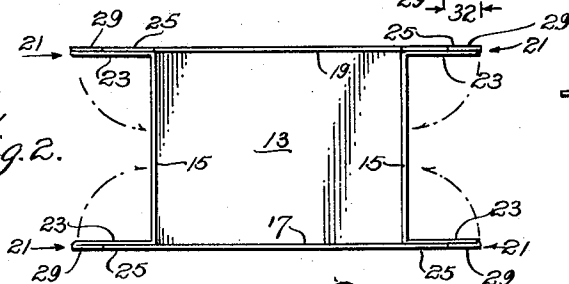


Fig. 3.

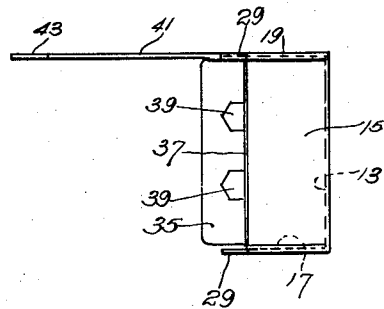
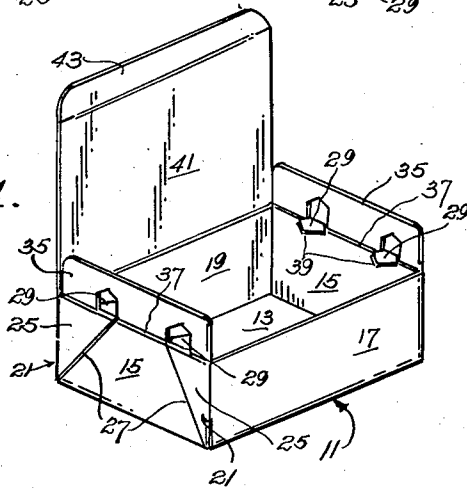


Fig. 4.



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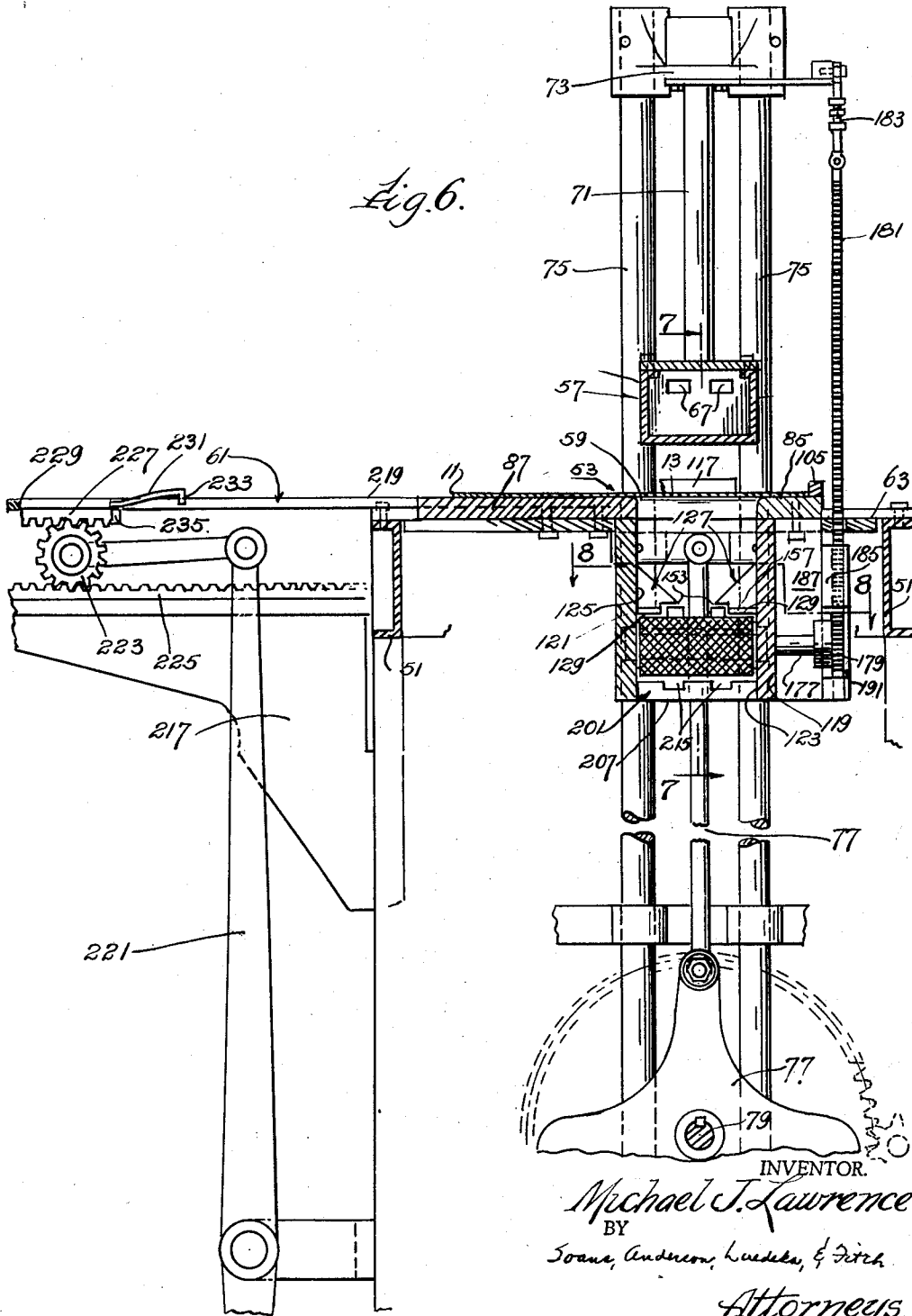
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Fig. 6.



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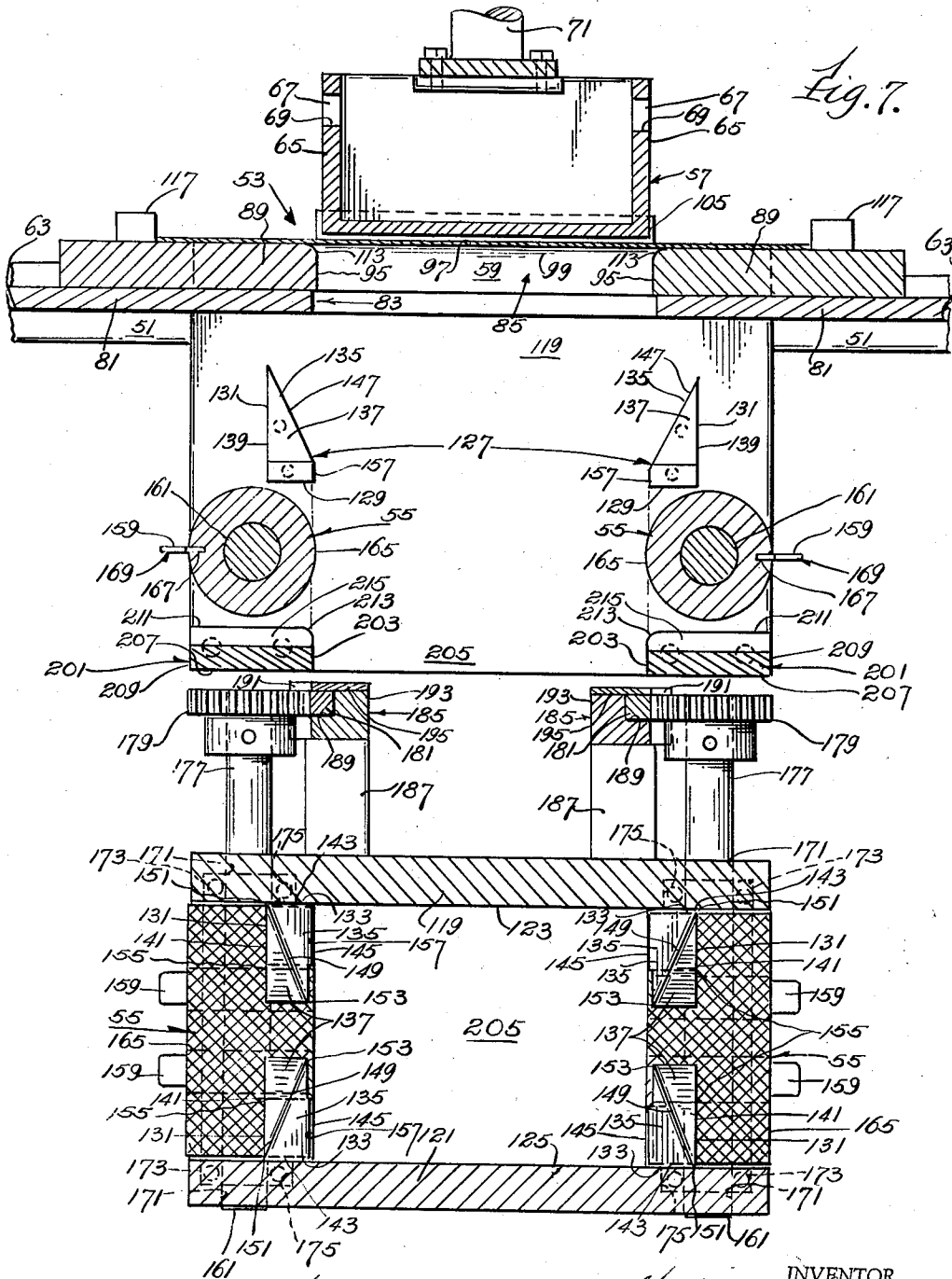


Fig. 8.

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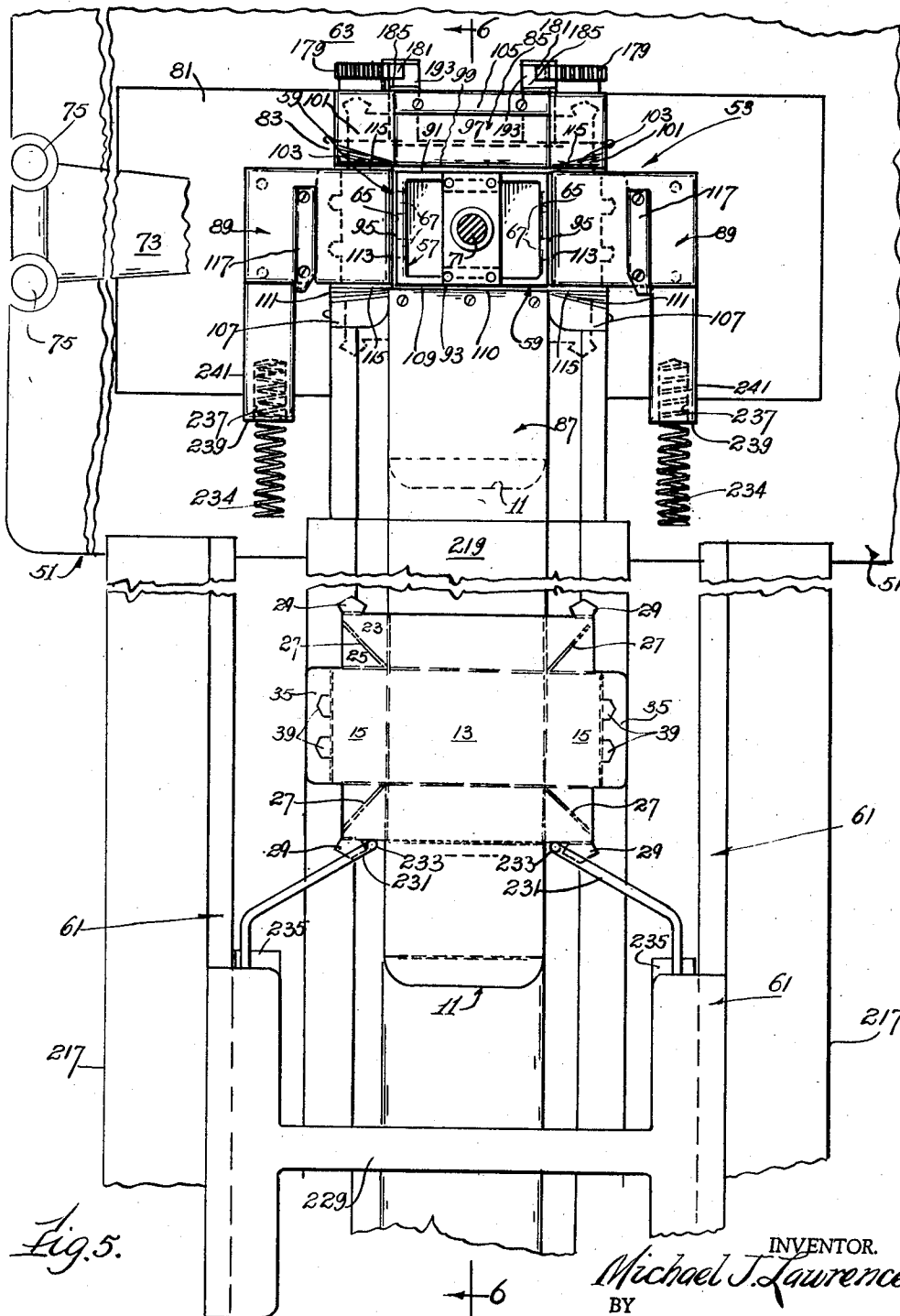


Fig. 5.

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2,909,105

CARTON SET-UP MACHINE

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Application October 3, 1957, Serial No. 687,980

5 Claims. (Cl. 93—51)

This invention relates generally to an apparatus for setting up folding cartons, and more particularly to an apparatus for setting up a specific form of pre-cut paperboard blank into a leak-proof, open carton or container.

The apparatus disclosed herein is particularly designed to set-up a leak-proof folding carton of similar construction to that which is disclosed in application Serial No. 668,065, entitled "Carton," filed by Fred A. Ryder on June 26, 1957, and assigned to the assignee of the present invention. More specifically, the present set-up machine is adapted for erecting a rectangular folding carton having foldable corner members with extending tabs which co-act with suitable openings in underlying panels in the erected carton.

The principal objects of the invention are to provide a machine for setting up folding cartons such as are disclosed in application Serial No. 668,065; to provide a machine suitable for setting up folding cartons having corner members with extending tabs which interlock through suitable openings in underlying panels or walls when the carton is in the erected condition; to provide a machine of the character indicated that is relatively simple in operation and fabrication, and which is highly reliable in operation; and to further provide a machine that will operate satisfactorily over long periods of time without breakdown or need of repair.

Other objects and advantages of the invention will become known by reference to the following description and the accompanying drawings of one embodiment of the invention.

In the drawings:

Fig. 1 is a plan view of a carton blank which may be erected or set-up on a set-up machine formed in accordance with the present invention;

Fig. 2 is a top view illustrating the carton blank shown in Fig. 1 with its side and end wall panels set up and with its corner members outwardly extending from the side wall panels;

Fig. 3 is a side view of the partially set-up carton illustrated in Fig. 2;

Fig. 4 is a perspective view of a set-up carton erected from the carton blank shown in Fig. 1;

Fig. 5 is a broken top plan view, partially in section, of a set-up machine formed in accordance with this invention, showing a carton blank in dotted outline under the punch and another blank shown in the feeding mechanism;

Fig. 6 is a partial cross-sectional view taken along line 6—6 of Fig. 5;

Fig. 7 is a cross sectional view taken along line 7—7 of Fig. 6; and

Fig. 8 is a cross sectional view taken along line 8—8 of Fig. 6.

Illustrated in Fig. 4 is a folding carton indicated generally by the numeral 11, such as may be erected or set up by apparatus formed in accordance with the present invention. The folding carton 11 is formed from a

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carton blank 12 illustrated in Fig. 1. The carton blank 12 is of generally rectangular shape and comprises generally a rectangular bottom panel 13, rectangular end wall panels 15, front and rear side wall panels 17 and 19, and corner members, which may be of various forms but in the present case, are in the form of gussets 21. The end wall panels 15 and the front and rear side wall panels 17 and 19 are integral with the bottom panel 13 being defined by suitable scoring or fold lines. Each of the corner gussets 21 is integral with the respective adjoining end walls 15 and the appropriate side wall 17 or 19, also being defined by suitable scoring or fold lines.

The gussets 21 are of generally rectangular form and are divided into two generally triangular portions 23 and 25 by fold lines 27 which extend outward from the respective adjacent corners of the bottom panel 13 diagonally across the gussets. Each of the corner members or gussets 21 is provided on the outside edge, which may be considered an extension of the appropriate side wall 17 or 19, with an outward extending tab 29 having generally a length 31, a width 32 and a neck 33 (see Fig. 1).

The end wall panels 15 are each provided with an integral and generally rectangular flap 35 which is foldably connected thereto through a suitable score 37. Provided in each of the end wall flaps 35 are a pair of generally rectangular tongue flaps 39 which are foldable along the score 37. Each of the tongue flaps has a height and a width which are somewhat less than the length 31 and the width 32, respectively, of the gusset tab 29. The tongue flaps 39 in each of the end wall flaps are spaced apart so that when the carton is set up and the corner gussets are folded into overlying relationship to the end wall panels, the gusset tabs 29 will overlie the tongue flaps 39, and be locked within the openings defined by displacement of the foldable tongue flaps 39.

The carton is also provided with a generally rectangular cover panel 41 integral with the rear side wall 19 and a generally rectangular cover tuck 43 integral with the cover panel 41.

The setting up machine illustrated in Figures 5, 6, 7 and 8 is adapted to set up the folding carton 11 and comprises generally a frame 51 upon which is mounted a forming die structure, indicated generally at 53, including a pair of rollers 55, a co-acting punch 57 having reciprocal movement through an opening 59 in the die structure 53, a feeding mechanism 61, and a drive mechanism for providing motion in timed relation to the rollers 55, to the punch 57, and to the feed mechanism 61.

The frame 51 is fabricated of suitable structural members such as angle iron and comprises an open top or mounting surface 63 supported by a suitable number of legs. Carried in the lower portions of the frame 51 are portions of the drive mechanism including a drive motor operating through suitable gearing and a suitable clutch which are connected to suitable means for driving the punch 57, rollers 55, and feeding mechanism 61. The details of the drive mechanism are not a part of the present invention and will, therefore, not be specifically described.

The punch 57 may be of any suitable material such as aluminum and may be fabricated by casting and milling or by any other suitable method. The punch is generally hollowed out to reduce weight and conserve metal and is of rectangular shape having an outside length and width conforming generally to the inside dimensions of the bottom panel 13 of the carton 11, and having a height at least as high as the combined heights of the end wall panels 15 and end wall flaps 35. The ends 65 of the die which correspond to the end wall panels of the folding carton are each provided with a pair of spaced apart generally rectangular openings 67 having a height and a

width slightly larger than the respective length 31 and width 32 of the gusset tabs 21 of the folding carton. The openings 67 are spaced apart in alignment with the foldable tongue flaps 39 of the end wall flaps 35. The lower edge 69 of the openings 67 are located parallel to the bottom surface of the punch at a distance substantially equal to the inside height of the end wall panels 15 of the carton.

The punch is secured by suitable means to an arbor 71 extending downward from a bracket 73 which is suitably connected to one end of a pair of rods 75 extending through an outer portion of the frame mounting surface 63. The rods 75 are suitably connected at their other end below the mounting surface 63 to a slider crank forming a part of the drive mechanism which imparts reciprocal movement to the rods 75, brackets 73 and punch 57. The slider crank mechanism 77 is driven by a drive shaft 79 suitably interconnected through a suitable clutch and suitable gearing to a drive motor located in the lower portion of the frame 51.

The punch 57 co-acts with the die structure 53 reciprocating through the die opening 59 which is of generally rectangular shape and which is located in a plane normal to the reciprocal movement of the punch 57. On the inward stroke of the punch 57 the end wall and side wall panels of the carton blank are formed into upstanding relation to the bottom panel 13 and the corner gussets 21 are formed along the fold line 27 so that the portions 23 and 25 are in face-to-face relation extending outward in generally co-planar relation with the side wall panels 17 and 19, as illustrated in Figures 3 and 4.

The die structure 53 is mounted on the top surface 63 of the frame 51 by suitable means such as by a plurality of nuts and bolts, and includes a die plate 81 of steel or other suitable material, which is generally rectangular and which has a centrally located, generally rectangular opening 83. Attached to the die plate 81 about the opening 83 by machine screws or other suitable means is a front forming plate 85, which is spaced apart in parallel relation from a rear forming plate 87 and two spaced apart, side forming plates 89 also in parallel relation. The respective inside edges 91, 93, and 95 of the above four plates form the generally rectangular die opening 59 which is of substantially the same size as the outside dimensions of the bottom panel 13 of the folding carton.

The front forming plate 85 is rectangular in shape having a rectangular top central portion 97 which extends the full width of the plate and which is substantially the same length as the outside length dimension of the bottom panel 13 of the folding carton 11. The top inside corner edge formed by the inside edge 91 and the top surface of the central portion 97 is provided with a radius 99 of suitable size to prevent cracking or creasing of the carton blank when forming the walls into upstanding relation with the bottom panel. Extending from both sides of the central portion 97 are end lower shoulder portions 101 which are of greater length than the height of the wall panels of the carton 11. The top inside corner edges of the end lower shoulder portions 101 formed by the inside edge 91 and the top surface of the end lower shoulder portions 101 is also provided with a radius 103. Adjacent the central portion 97, the radius 103 is about the same size as the radius 99 provided on the central portion 97. However, the radius 103 becomes increasingly larger toward the end of the shoulder.

Provided outward of and parallel to the inside edge 91 at a distance substantially equal to the height of the front wall panel 17 on the top surface of the front forming plate 85 is a front carton stop 105 for assisting in correctly positioning the bottom panel 13 of the carton blank over the die opening 59.

The rear forming plate 87 is generally square in shape and is provided along the inside edge 93 with two end corner lower shoulder portions 107 which are generally

rectangular in shape. The central portion 109 of the inside edge 93 included between the end corner lower shoulder portions 107 is substantially the same length as the central portion 97 of the front forming plate 85. The top corner edge of the central portion 109 of the inside edge 93 is provided with a radius 110 similar to the radius 99 provided on the central portion 97 of the front plate 85. The inside edges of the end lower shoulder portions 107 are each also provided with a radius 111 similar to the radius 103.

The side forming plates 89 are generally rectangular in shape with the inside edge 95 having a length somewhat less than the outside width of the bottom panel 13 of the carton. The top corner edges formed by the intersection of the respective inside edges 95 and the top surface of the side forming plates 89 are provided with a radius 113 which is of substantially the same size as the radius 99 provided on the central portion of the front plate 85. The side forming plates are spaced between the front and rear forming plates 85 and 87 so as to provide a slot 115 extending outward from each corner of the die opening 59 between the inside edges of the respective lower shoulder portions 101 and 107 of the front and rear forming plates and the ends of the side forming plates 89. Each of the slots 115 cooperates with the respective adjacent radius of the lower shoulder portions to form the corner members or gussets into outstanding relation generally coplanar with the side wall panels 17 and 19 of the carton.

Provided outward and parallel to the inside edges 95 at a distance substantially equal to the combined height of the end wall panels 15 and the width of the end wall flaps 35 on the top surface of each of the side plates 89 is a slide guide 117 for assisting in correctly positioning the bottom panel 13 of the carton blank over the die opening 59.

Depending downward and spaced apart in parallel relation from the front and rear forming plates 85 and 87 are front and rear forming die side plates 119 and 121 having inside surfaces 123 and 125, respectively. Each of the forming die side plates 119 and 121 is generally rectangular, having a length substantially the same as the front and rear forming plates 85 and 87. Each of the forming die side plates 119 and 121 is located so as to place their respective inside surfaces 123 and 125 in co-planar relationship with the inside edges 91 and 93 of the front and rear forming plates.

Various means well known in the art may be employed to fold the corner members or gussets into overlying relation with the wall panels of a folding carton. In the disclosed embodiment a pair of corner folders 127 are suitably secured as by machine screws or the like to each of the forming die side plates 119 and 121 beneath the outward extending slots 115. The corner folders 127 are identical, except for being right and left hand, generally taking the shape of a five-sided polygon having a generally rectangular base 129, an outer face 131, a side plate mating face 133, a folding inner face 135, and a non-folding inner face 137. The outer face 131 and the side plate mating face 133 take the form of a right triangle normal to the rectangular base 129 which have a common leg 139 defining the height of the polygon. The other legs 141 and 143 of the respective triangular surfaces of the outer face 131 and side plate mating face 133 define respectively an outer length edge and a width edge of the rectangular base 129.

The folding inner face 135 is defined by an inside length edge 145 of the rectangular base 129 by the hypotenuse 147 of the side plate mating face 133 and by a folding edge 149 joining the apex 151 of the side mating plate and outer plate faces 131 and 133 to the corner 153 of the base opposite the corner formed by the legs 141 and 143. The non-folding inner face 137 is formed by the other width edge 153 of the rectangular base 129 by the hypotenuse 155 of the outer face 131

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and by the folding edge 149. The folding edge 149 is provided with a suitable radius. The base of the corner folder is provided with a recessed outer shoulder adjacent the edge 153 to provide clearance of the locking tabs (hereinafter described) of the rollers 55. The lower portion of the folding face 135 adjacent the edge 145 is provided with a thin face 157 which is parallel to the outer face 131.

The corner folders 127 are secured so as to position the side plate faces 133 in mating contact with the inside surfaces 123 and 125 of the forming die side plates to position the bases 131 in a plane normal to the reciprocating motion of the punch, and to position the thin faces 157 co-planar with the inside edges 95 of the side forming plates 89.

While various ways and means may be employed to interlock the gusset tabs with openings in the underlying panels, in the disclosed embodiment a pair of cylindrically shaped squeeze rollers 55 having a pair of locking tabs 159 are employed to squeeze the corner gussets 21 against the end wall panels 15 to sharply form the carton and to insert the gusset tabs 29 into interlocking relation with openings in the end wall flaps 35 formed by displacement of the foldable flaps 39.

The cylindrical squeeze rollers 55 extend in spaced apart parallel relation between the forming die side plates 119 and 121 below the corner folders 127. Each of the squeeze rollers is mounted on a squeeze roller shaft 161 and is secured thereto by suitable means as by a set screw (not shown). The cylindrical surface of each of the squeeze rollers 55 is preferably knurled and extends for almost the entire length between the side plates 119 and 121. The squeeze rollers 55 are so located, and have a diameter so determined that the outside surface of the rollers defines with the inside surfaces 123 and 125 of the respective forming die side plates 119 and 121 a rectangular opening which is in alignment with the die opening 59 and which has a width somewhat less than the width of the die opening and slightly greater than the width of the punch 57. During forming of the carton the corner members or gussets are thereby squeezed tightly by the rollers against the end walls of the carton.

Extending along the length of each of the squeeze rollers is a radial slot 167 adapted to receive a lock tucker 169 having a pair of spaced apart generally parallel locking tabs 159. The lock tuckers 169 are formed from a flat sheet of steel or other suitable material and are generally rectangular having a length substantially equal to the length of the outer surface of the rollers 55, and a width substantially equal to the depth of the slot 167. The locking tabs 159 extend outward of the outer surface of the rollers from one of the length edges of the lock tucker and are of generally rectangular shape having a height and width slightly less than the height and width of the foldable tabs 39 of the folding carton, and are spaced apart in relation to the spacing of the foldable tabs 39 of the folding carton.

The squeeze roller drive shafts 161 may be of steel or other suitable material, and extend through holes 171 in the lower outer corner portions of the front and rear forming die side plates 119 and 121. Each of the shafts 161 is suitably journaled in ball bearings 173 fitted into circular recesses 175 located on the inside surfaces 123 and 125 concentric with the holes 171. The ends 177 of each of the shafts 161 which pass through the holes 171 in the front forming die side plate 119 extend outward and have suitably attached thereto each a gear or pinion 179. The gears 179 co-act on their adjacent outer surfaces with a pair of parallel racks 181 which are generally rectangular in cross section and which extend upward being suitably attached through an adjusting means such as a pair of turn buckles 183 to the supporting arm 73.

Each of the racks 181 passes through a guide block

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185 of brass or other suitable bearing material, which is provided for supporting and locating the racks 181 in mating position with the gears 179. The guide blocks 185 are secured in parallel spaced apart relation to similarly separated spacers 187 which in turn are secured to the outer surface of the front forming die side plate 119 by any suitable means such as machine screws or the like. The two guide blocks 185 are of similar construction except for being right and left handed, and are each of generally rectangular shape having a rectangular hole or opening 189 running the length of the block through which the rack 181 passes. An opening 191 is provided along one side of the guide block so that a portion of the reciprocating rack 181 within is accessible for mating with the gear 179. In this embodiment, the guide blocks 185 comprise a channeled guide 193 which is covered by a cap 195 to form the lengthwise rectangular opening 189.

As the racks are attached to the supporting arm 73 they have reciprocal movement corresponding to that of the punch 57. As the supporting arm 73 reciprocates downward the racks 181 impart oscillating movement convergent with the punch 57 to each of the gears 181 thereby oscillating the squeeze rollers 55 in a direction convergent with the punch 57. The squeeze roller gears 179 should be oriented with respect to the racks 181 so as to cause the locking tabs 159 of the squeeze rollers to be extending inward adjacent the lower edge 69 of the die openings 67 when the locking tabs are in a plane normal to the reciprocal movement of the punch. Accurate adjustment of this relation may be had by utilization of the turn buckles 183.

While various methods may be provided for stripping the carton from the punch, in this embodiment a pair of generally rectangular carton strippers 201 extend beneath the squeeze rollers 55 in spaced apart parallel relation between the lower outer portions of the inside surfaces 123 and 125 of the forming die side plates. The carton strippers 201 have inside edges 203 which form together with the inside surfaces 123 and 125 a rectangular opening 205 which is in alignment with and which is substantially the same size as the die opening 59. Each of the carton strippers 201 has a lower face 207 which is generally co-planar with the lower edges of the forming die side plates and has an outer edge 209 which is generally co-planar with the outer side edges of the forming die side plates.

The top inside edge corner of each of the strippers 201 formed by the intersection of the inside edge 203 and the upper surface 211 is provided with a radius 213 for aiding in the entry of the carton into the opening 205. The upper surface 211 of each of the strippers is also provided with a pair of spaced apart and parallel channels 215 for providing clearance for the locking tabs 159 of the squeeze rollers 55. The channels run outward and generally perpendicular to the inside edges 203 of the strippers and are spaced in relation to the spacing of the locking tabs 159.

The various parts which together comprise the die structure 53, unless otherwise noted, may be of any suitable metal such as steel or aluminum but are preferably of aluminum to take advantage of the easy machineability of this metal. Those surfaces coming into contact with the carton, unless otherwise noted, are preferably polished to provide smooth surfaces which will not harm the surface texture of the panels of the carton.

Various methods may be employed to feed blanks to the punch and die. Blanks may be hand fed directly against suitable stops over the die opening or the machine may be co-ordinated with an automatic feeding mechanism. In the disclosed embodiment, a hand fed feeding mechanism 61 is employed which, in cooperation with the front carton stop 105 and the slide guides 117, automatically positions the carton blanks with the bottom panel 13 located centrally over the die opening 59. The

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feeding mechanism 61 comprises generally a stand 217 suitably attached to the frame 51, a central top plate 219 upon which the carton blank is hand fed, and which extends adjacent to and is co-planar with the top surface of the rear forming plate 87, and a linkage 221 forming a part of the drive mechanism which converts the motion of a cam follower (not shown) into straight line motion of a pair of pinions 223. Each of the pinions 223 is included between each of two parallel lower stationary racks 225 provided in the stand 217 and two parallel upper reciprocating racks 227 spaced outward of the central top plate 219. The upper racks 227 are connected by a cross bar 229 straddling the top plate 219. The upper reciprocating racks 227 are each provided with an extending wire-like finger 231 having end portions 233 operating adjacent the side edges of the top plate 219 to position the carton blank over the die opening 59.

A pair of springs 234 are provided to cushion the extreme inward motion of the upper reciprocating racks 227 in order to prevent the carton blank from being urged against the front carton stop 105 with such force as to possibly damage the carton blank. Each of the springs 234 operates against a bumper 235 provided at the inner end of each of the upper reciprocating racks 227 and is set in a circular recess 237 provided at the outer end 239 of a pair of rectangular die blocks 241 mounted to the die plate 81 in spaced apart parallel relation outward of the side edges of the rear forming plate 87.

While the disclosed machine may be adapted for automatic feeding, the illustrated machine is hand fed by placing a blank on the top plate 219 of the feed mechanism 61. The fingers 231 of the feeding mechanism move the blank horizontally over the forming plates and between the slide guides 117 until the leading edge of the front side panel 17 is against the front carton stop 105. In this position, the bottom panel 13 of the carton is centered over the die opening 59 and centered under the punch 57 which is at its uppermost position. As the feed fingers 231 move away laterally, the supporting bracket 73 moves downward carrying the punch downward and causing the squeeze rollers 55 to begin rotating. As the punch passes into the die opening 59, the bottom panel 13 of the carton is carried downward and the end panels 15 and the front and rear side panels 17 and 19 are formed upward over the radii of the forming plates into upstanding relation to the bottom panel 13.

The gussets 21 of the carton fold inward along the scores 27 and the portions 23 fold outward from the interior surface of the respective end panels 15. In this fashion the portions 23 and 25 of the gussets 21 enter into face to face relation becoming generally co-planar with the respective front and rear side panels 17 and 20 and pass through one of the appropriate slots 115 between the ends of the side forming plates and the inside surfaces of the front or rear forming plates. As the punch moves deeper into the die opening, each of the folded edges formed by the scores 27 of the gussets 21 is urged against respective corner folders 127 causing the gussets to turn inward until each of the gussets is adjacent the respective end wall panels 15. As the punch moves still further down into the die opening the folded gussets are squeezed against the end wall panels by the rotating squeeze rollers 55. As the carton passes between the squeeze rollers, the locking tabs 159 enter the punch openings 67 pressing the gusset tabs 29 against the foldable tabs until the larger gusset tongues pass through the openings in the end wall flaps caused by displacement of the foldable flap 39. As the width and length on the gusset tabs are greater than the respective height and width of the openings, the gusset tabs are therefore locked in position inside the end wall flaps 35 and will cause the wall panels to remain in the upright position forming an open top rectangular carton or container. The die moves further downward until the locking tabs of the

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squeeze rollers rotate out of the punch openings 67 and the punch passes through the lower die opening 205 and reaches dead bottom carrying the tray portion of the set-up carton 11 through the opening 205 to below the strippers 201. Because of the generally tight fit of the set-up carton 11 about the punch 59, the carton will not fall from the punch. However, a slight bow will always occur in the end wall panels 15, and as the punch moves upward the carton will be stripped from the punch by action of the bowed end wall panels 15 which come into contact with the lower face 207 of the strippers. Various methods may be employed to catch and remove the set-up carton from below the forming die such as by a slide, by an automatic conveyor system, etc.

By the time the punch reaches dead bottom the feed fingers are fully retracted and another carton blank may be loaded. As the punch moves upward to the top position the squeeze rollers are each rotated back to their starting positions. When the punch emerges from the die opening 59 the feed mechanism will begin again to position the carton blank in the die.

While the specific machine disclosed is adapted to set up the described folding carton 11, similar machines may be constructed in accordance with this invention for setting up folding cartons having a variety of modifications from the specific carton described and illustrated.

These modifications include among others, cartons of other sizes and shapes, cartons having corner members folded over the side wall panels rather than the end wall panels, cartons having top panels extending from any of the wall panels, and cartons having tabs and panel openings of other configurations and at other locations.

A machine of this type is also readily adaptable for association with automatic equipment for blank feeding and with automatic equipment for receiving the set-up carton from the stripper and carrying it to the next operation. A machine of simple construction such as this will give long service of reliable operation requiring little maintenance and upkeep.

Various changes and modifications may be made in the disclosed construction without departing from the scope of the invention which is to be determined from the appended claims.

I claim:

1. An apparatus for setting up folding cartons having foldable corner gussets with extending tabs for interlocking with openings in certain of the carton panels to maintain the carton in erected form, said apparatus comprising a frame upon which is mounted a forming die and a reciprocating co-acting punch, said forming die comprising generally a plurality of forming plates which form an upper die opening conforming generally to the outside dimensions of the bottom panel of the carton, said upper die opening having slots outwardly extending from the corners thereof, said upper die opening and said slots cooperating with said punch on the downward stroke to form the wall panels into upstanding relation to the bottom panel of the carton and to fold the gussets into outward extending relation co-planar to opposing side wall panels, a pair of downward extending spaced-apart side plates depending from said forming plates having inside surfaces co-planar with opposing sides of said upper die opening, a plurality of corner folders secured to said side plates under said slots adapted to fold the gussets of the carton from the outward extended position to a position in overlying relation to the outer surface of certain of the carton panels with the gusset tabs positioned in registry with the openings in the underlying panels, a pair of spaced-apart oscillatory rollers having movement for tightly pressing the corner gussets and the underlying carton panels against the sides of said punch, said rollers being mounted transversely between said side plates below said corner folders in a plane normal to the reciprocating movement of said punch and having outer surfaces defining with said inside surfaces an intermediate

opening in alignment with said upper die opening having a width slightly larger than said punch width, each of said rollers having a pair of outwardly extending spaced-apart locking tabs engaging the gusset tabs and traveling in a path extending through the underlying panel openings to thereby insert the gusset tabs within the underlying panel openings, and a pair of spaced-apart parallel strippers secured transversely between said side plates below said rollers, said side plates and strippers forming a lower die opening which act to strip the set-up carton from said punch on the upward stroke of said punch, said lower die opening being of substantially the same size as said upper die opening and being parallel to and aligned with said upper die opening, a feed mechanism having linear reciprocal movement secured to said frame for positioning carton blanks under said punch, and a drive mechanism secured to said frame for imparting in timed relation said reciprocal movement to said punch, said rollers and said feeding mechanism, said punch having a shape conforming generally to the inside dimensions of the bottom panel of the carton and having openings for cooperating with said locking tabs, said reciprocal motion of said punch being from limiting positions outward of said upper and lower die openings, said oscillating movement of each of said rollers being provided by a gear affixed to an end of each of said rollers which extends exterior to one of said side plates, said gear co-acting with a reciprocating rack interconnected with said driving mechanism.

2. An apparatus for setting up folding cartons having foldable corner members which have extending tabs for interlocking with openings in certain of the carton panels to maintain the cartons in erected form, comprising a forming die and a co-acting punch, said punch having movement through said die, said die including means effecting folding of the corner members into overlying relation to certain of the carton panels with the corner member tabs positioned in registry with the openings of the underlying panels as said punch moves through said die, and means engaging the corner member tabs and traveling through the underlying panel openings to thereby interlock the tabs within the openings.

3. An apparatus for setting up folding cartons having foldable corner members which have extending tabs for interlocking with openings in certain of the carton panels to maintain the cartons in erected form, comprising a forming die and a co-acting punch, said punch having movement through said die, said die including a plurality of corner folders affording folding of the corner members into overlying relation to certain of the carton panels with the corner member tabs positioned in registry with the openings of the underlying panels during travel of said punch through said die, and a pair of spaced apart parallel rollers arranged on opposite sides of said die below said corner folders for tightly pressing said corner members and the underlying panels against the sides of said punch, said rollers having outwardly projecting

means engaging the corner member tabs and traveling through the underlying panel openings to thereby interlock the tabs within the openings.

4. An apparatus for setting up folding cartons having foldable corner members which have extending tabs for interlocking with openings in certain of the carton panels to maintain the cartons in erected form, comprising a forming die and a co-acting punch, said punch having linear reciprocal movement through said die, a feeding mechanism supported by said apparatus for positioning carton blanks under said punch, said die including a plurality of corner folders affording folding of the corner members during travel of said punch through said die into overlying relation to certain of the carton panels with the corner member tabs positioned in register with the panel openings, a pair of spaced-apart parallel oscillatory rollers arranged on opposite sides of said die below said corner folders for tightly pressing the corner members and the underlying panels against the sides of said punch, said rollers having a pair of outwardly projecting tabs engaging the corner member tabs and traveling through the underlying panel openings to thereby insert the tabs within the openings, and means for stripping the carton from said punch.

5. An apparatus for setting up folding cartons having foldable corner gussets which have extending tabs for interlocking with openings in certain panels to maintain the carton in erected form, comprising a frame upon which are mounted a forming die and a co-acting punch, a feeding mechanism secured to said frame having linear reciprocal movement for positioning carton blanks under said punch, said punch having linear reciprocal movement through said die, said die including a plurality of corner folders effecting folding of the corner gussets into overlying relation to the outer surface of certain of the carton panels with the gusset tabs positioned in register with the openings in the underlying panels, and a pair of spaced-apart parallel oscillatory rollers arranged on opposite sides of said die below said corner folders for tightly pressing said corner gussets and the underlying panels against the sides of said punch, said rollers having a pair of outwardly extending locking tabs engaging the gusset tabs and traveling in a path extending through the underlying panel openings to thereby insert the gusset tabs within the underlying panel openings, and means for stripping the carton from said punch, and a drive mechanism secured to said frame for imparting in timed relation said movement to said punch, said rollers and said feed mechanism.

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