The present invention relates to container fabricating machines and, more specifically, to a machine for making disposable cartons of paperboard or other bendable sheet material.

The invention finds particular, but not exclusive, utility in a machine for forming flat-topped cartons such as the ones disclosed in the application Serial No. 135,430 filed December 28, 1949, by Charles H. Dixon, and in Patent No. 2,581,237 issued January 1, 1952, upon the application of Roger H. Casler. Such cartons are self-sustaining in shape and, when coated or impregnated to render them impervious, are particularly well suited for the distribution of milk and other comestibles.

The general aim of the present invention is to provide a machine of the character set forth and having novel top preforming and top closing units, such units being capable of receiving an erected carton body having a closed bottom and an open top, manipulating the upper end of the carton body to complete the forming of its top closure, and ultimately presenting the completed carton to a discharge conveyor.

Another object is to provide a high-speed, continuous motion machine of the type just mentioned, performing its operations upon a procession of blanks moving through the machine at a rapid but substantially constant rate.

A further object is to provide a machine of the character set forth and which will be easy to clean and maintain, fully conforming to the rigorous sanitary requirements that must be met for dairy equipment and similar applications.

Other objects and advantages will become apparent as the following detailed description proceeds, taken together with the accompanying drawings, wherein:

Figure 1 is a side elevation of an illustrative carton fabricating machine embodying the present invention.

Figure 2 is a plan view of the illustrative machine of Figure 1.

Figure 3 is an enlarged, fragmentary perspective view of the upper portion of a carton body and showing the top closure parts prior to entry of the body into the top preformer unit.

Figures 4, 5 and 6 are stop-motion views showing sequentially the steps in outfolding of the front and rear top flange panels of the carton.

Figure 7 is an enlarged, fragmentary perspective view of the upper portion of the carton body as its front and rear top flanges are outfolded and confined by the stationary hold down cams.

Figures 8 and 9 are enlarged, fragmentary vertical sectional views taken through the preformer unit in the planes of the lines 8—8 and 16—16, respectively.

Figure 10 is an enlarged, fragmentary perspective view of the upper portion of the carton body and showing the adhesive coating on the inside major top flap and the outfolded top flap.

Figure 11 is an enlarged, fragmentary horizontal sectional view taken along the top flange hinge line and in the plane of the line 11—11 in Figure 5.

Figure 12 is an enlarged, fragmentary perspective view showing the hold down and squeeze cams of the preformer unit.

Figure 13 is an enlarged plan view of the top preformer unit with one cover cut away to permit illustration of the inside details, such view being taken from the plane of the line 13—13 in Figure 1.

Figure 14 is an enlarged, fragmentary elevation of the top preformer unit, taken in the plane of the line 14—14 in Figure 2.

Figure 15 is an enlarged, fragmentary vertical sectional view through the top preformer unit taken in the plane of the line 15—15 in Figure 14.

Figure 16 is an enlarged, vertical sectional view through the top preformer unit and taken in the plane of the line 16—16 in Figure 13.

Figure 17 is an enlarged, fragmentary perspective view of the upper portion of the carton shortly after leaving the top preformer unit.

Figures 18 and 19 are detail views showing certain steps in the downfolding of the outside major top flap and the gripping tab projection thereof.

Figures 20 and 21 are enlarged plan views showing the nominal shear disk and fragmentary portions of the top preformer unit and the top closing turret adjacent thereto.

Figure 22 is a vertical sectional view through the top closing turret, taken in the plane of the line 22—22 in Figure 2.

Figure 23 is an enlarged, fragmentary elevation detailing certain mechanisms housed within the top closing turret of the machine.

Figure 24 is an enlarged, fragmentary horizontal sectional view through the top closing turret taken in the plane of the line 24—24 in Figure 1.

Figure 25 is an enlarged, fragmentary horizontal sectional view through the top closure head taken in the plane of the line 25—25 in Figure 23.

Figure 26 is an enlarged, fragmentary vertical sectional view through the top closure head shown in the lower portion of Figure 23.

Figure 27 is a horizontal sectional view corresponding to Figure 25 but showing the jaws in open rather than closed position.

Figure 28 is an enlarged, fragmentary elevation detailing certain manipulating devices incorporated into the top closure head of Figure 23.

Figure 29 is an enlarged, fragmentary vertical sectional view through the top closure head taken in the plane of the line 29—29 of Figure 27.

Figure 30 is an enlarged, fragmentary perspective view detailing one of the heated pressure pads carried by the top closing turret and certain manipulating elements associated therewith.

Figure 31 is an enlarged, vertical sectional view through one of the pressure pads carried by the top closing turret.

Figure 32 is a fragmentary vertical sectional view taken in the plane of the line 32—32 in Figure 31.

Figure 33 is an enlarged, fragmentary perspective view showing a completed carton as it leaves the machine.

While the invention is susceptible of various modifications and alternative constructions, a carton fabricating machine representing an illustrative embodiment of the invention has been shown in the drawings and will be described below in considerable detail. It should be understood, however, that there is no intention to limit the invention to the specific form disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, and equivalents, falling within the spirit.
and scope of the invention as expressed in the appended claims.

**General machine organization**

Referring more specifically to Figs. 1 and 2, the invention is exemplified in an illustrative container fabrication machine which happens to be of the continuous motion type. By this is meant that the cartons being formed by the machine are moved through the latter in a continuous procession at a substantially constant rate, the forming operations being carried on while the carton blanks and bodies are in motion.

The machine 50 comprises a base 51 fashioned as a closed housing and having legs 52 which support the base a sufficient distance above the floor to permit thorough cleaning and inspection beneath the machine. Mounted on the base 51 are a blank feeder mechanism 54, body forming unit 55, a top preformer unit 56, a top closing unit 58 and a conveyor 59. The blank feeder mechanism 54, which may be similar to the one disclosed in copending application Serial No. 50,147 filed September 20, 1948 (now Patent 2,656,733, issued Apr. 28, 1953), by Arthur J. Lewis, is adapted to hold a stack of single ply, horizontally disposed blanks and to feed them one by one up an arcuate pathway, presenting each blank in a vertical position to the body forming unit 55. The latter is constructed and arranged to erect the blank into a tubular carton body and to complete the bottom closure of the carton body, eventually delivering the latter to the top preformer unit 56. The preformer unit 56 is arranged to break the top closure elements of the carton body in the proper manner to facilitate the subsequent steps in the formation of the top closure. An appropriate conveying means moves each carton body through the preformer unit 56 and thereupon delivers it to the top closing unit 58. This unit performs all the steps necessary to complete the top closure except for securing the filling flap in sealed position. The substantially completed cartons are then delivered by the top closing unit 58 to the discharge conveyor 59 which carries them to an appropriate mechanism for coating or impregnating them with a moistureproof substance such as paraffin and at the same time performing the necessary sterilization.

It is with the top preformer unit 56 and the top closing unit 58 that the present application is particularly concerned. Consequently, the description which follows will be confined primarily to these units and their operation. For additional information relating to the body forming unit, reference may be had to copending application Serial No. 318,882, filed November 5, 1952, by James F. Earp.

**Top closure parts**

When delivered to the top preformer unit 56, each carton C comprises a tubular rectangular body with a closed bottom and an open top. However, the parts which ultimately define the top closure of the carton are all preformed and selected areas on them are coated with thermoplastic adhesive. Since these parts are all in the upper portion of the carton body, only such portion need be described in detail herein.

Referring in particular to Figs. 3, 7 and 10, it will be perceived that the top closure parts of the carton C are situated above a common score line 66, which, incidentally, constitutes the top boundary of the carton body side panels. Corner score lines 61, 62, 64 and 65 of the carton body continue up into the top closure and divide the same into major areas coplanar with the respective side panels. A second common score line 66 cuts through the major panel areas of the top closure and defines, between itself and the score line 66, opposed front and rear roof panels 68, 69, as well as opposed side roof panels 70, 71. Front roof panel 68 is flanked by a pair of small gusset panels 72, 74, connected thereto along score lines 75, 76, respectively. Rear roof panel 69 is similarly flanked by gusset panels 78, 79 connected thereto along score lines 80, 81, respectively.

Hinged to each of the roof panels 68, 69, 70, 71 along the common score line 66, is a relatively narrow top flange comprising flange panels 68A, 69A, 70A, 71A. The flange panels 68A, 69A are attached to the bottom panel 66A, while the flange panels 70A, 71A are attached to the fractional panel areas 70A, 71A, respectively. By the same token, the fractional panel areas 70A, 71A are connected to the flange panel 69A along score lines 75A, 76A, respectively. An inner top flap 82 of generally rectangular shape is hingedly connected to the flange panel 70A along a score line 84. The flap 82 has a relatively large aperture 85 which serves both as a filling opening and a dispensing opening. The flap 82 also includes a projecting portion 86 adapted to coact with other members of the top closure in initially holding down the lift tab.

Hingedly connected to the flange panel 71A along a score line 88 is outer top flap 89. The latter includes a lift tab 90 terminating in a projecting portion comprising the tab areas 91, 92 and 93 and transverse score lines 95, 96.

As indicated by the stippled areas shown in Figs. 3, 7 and 10, selected areas of the top closure parts are precoated with a suitable thermoplastic adhesive. Unlike in this instance, the adhesive 101 is applied to those areas of the top flange which initially face the inside of the carton. It is also applied to the inside face of the inner top flap 82 so as to surround the filling and dispensing opening 85.

A limited amount of adhesive is also applied to the inside face of the projection 86 on the inner top flap 82. The outer top flap 89 has a band of adhesive extending around its lateral and marginal edge portions. In addition, certain small areas of the lift tab 90 and the tab panel 91 also have adhesive precoated thereon.

**Top preformer unit**

As shown in Figs. 1, 2, 13, 14 and 16, the top preformer unit 56 comprises a hollow upright standard 104, together with a surrounding preformer conveyor 105 and a carton supporting table 106.

The conveyor 105 comprises a series of open-sided buckets 108 constrained to move in an orbital path about the standard 104. Conveyor buckets 108 are adapted to receive from the body forming unit 55 a procession of open-topped carton bodies, each in the condition illustrated in Fig. 3, and to traverse the carton bodies along the table 106 for manipulation by the top preformer unit 56.

Each conveyor bucket 108 (Fig. 16) comprises an upstanding side panel having one or more relatively long trailing fingers 109 and one or more relatively short leading fingers 110, being connected by means of an integral offset bracket 111 to a double roller chain 112. In the present instance, the chain 112 is confined between laterally spaced guides 114 secured to the machine base as by blocks 115. To insure retention in the buckets 108 as the cartons are traversed through the top preformer unit 56, the latter may also include one or more guide rails 116 disposed in closely spaced relation with the course of the buckets 108.

At its upper end, the standard 104 terminates in an elongated gear box 118, closed by a cover 119. The gear box 118 supports a plurality of top closure manipulating elements disposed in overlying relation with the carton supporting table 106 and housed within a removable protective cover 120.

The first manipulation to take place in the top preformer unit is the infolding of front and rear roof panels 68, 69 and the outfolding of their associated flange panels 68A, 69A. In furtherance of this objective, the unit 56 is provided with a pair of rotor breakers 121, 122 of substantially identical form but opposite hand (Fig. 13).
unit 121 has a pair of diametrically opposed retarding fingers 124 each adapted to serve as a receding abutment and to contact the leading or front roof panel 68 of the carton just beneath the score line 66 (Fig. 4). The unit 122 has a pair of diametrically opposed accelerating fingers 125 each adapted to serve as an overtaking abutment and to contact the trailing or rear roof panel 69 just below the score line 66 (Figs 5 and 11). During the interval of contact between a pair of these fingers and a given carton, the relationship of the parts is such that the finger 124 will have a linear velocity component along the path of the carton, while the finger 125 will have a similar linear velocity component somewhat greater than the velocity of the carton.

Such action of course results in infolding the front and rear roof panels 68, 69, and also in infolding their neighboring triangular gusset panels 72, 74, 78, 79.

Outfolding of the leading flange panels 68A (Figs. 4, 5 and 7) at this time is accomplished by forcing the same under a hold down cam 126 fixed in overlying relation with the carton path and by the use of a notched folder wheel 128 driven in a counterclockwise direction as viewed in Figs. 4 and 5. The wheel 128 is formed with a peripheral groove 139 adapted to straddle the widening portion of the hold down cam 126. Each of the circular rings flanking the groove 129 of the wheel 128 has a pair of diametrically opposed, semicircular notches terminating in aligned pairs of radial abutments 130. As shown in Fig. 4, the abutments 130 accost the flange panel 68A and outfold it so that its free upper edge becomes confined between the upper face of the retarding finger 124 and the lower face of the hold down cam 126.

Outfolding of the trailing flange panel 69A is accomplished by the use of a hold down cam 131 also mounted in overlying relation with the carton path, the panel 69A being confined between the upper face of accelerating finger 125 and the lower face of the hold down cam 131.

In order to avoid improper rearward folding of the leading flange panel 68A against the bottom of the hold down cam 131, the latter is spaced a sufficient distance above the table 106 to give the flange panel 68A proper clearance. For the same purpose, the hold down cam 131 is spaced from the end of the hold down cam 126 and the table is provided with a lifter cam 132, the latter having an inclining ramp 134 and a declining ramp 135. The location of the lifter cam 132 is such that the carton C will tilt rearwardly as the flange panel 68A clears the end portion of the hold down cam 131, the associated monitor bucket 105 being sufficiently oversized to permit limited tilting of the carton. Further movement of the carton onto the lifter cam 132 restores the carton to vertical position and also increases the pressure which the hold down cam 131 brings to bear against the trailing flange panel 69A. At this point, the notched wheel 128, coacting with the retarding finger 124, folds the leading flange panel 68A downwardly and outwardly in the manner already described. The carton C continues its linear advance along the table 106 and lifter cam 132, the outer periphery of the notched wheel 128 serving to hold down the trailing flange panel 69A until the latter moves into underlying relation with the hold down cam 126. As the carton C travels along the declining ramp 135 of the lifter cam 132, the undersurface of the hold down cam 126 declines proportionally so as to maintain an appropriate degree of downward deflection on the outfolding flange panels 68A, 69A (Figs. 5 and 6).

For the purpose of infolding the side roof panels 70, 71 and 70 outfolding their respective flange panels 70A, 71A, as the carton C continues through the preformer, the hold down cam 126 has a progressively widening portion 138 and its underside becomes lower, exerting an increasing downward pressure over a widening area of the flange panels 68A, 69A. A pair of squeeze cams 139 is mounted in straddling relation with the widening portion 138 of the hold down cam 126 (Figs. 8, 9, 12 and 13). The squeeze cams 139 have inside longitudinal faces 140 which, when viewed in plan as in Fig. 13, converge toward the hold down cam 126 and ultimately cross under diverging lateral edges 141 of the cam 126, straightening out in an underlying relation with the marginal edge portions of the widest part of the cam 126. The converging edges 140 of squeeze cams 139 also diverge downwardly, each at an angle complementary to the desired ultimate inclination of its associated one of the side roof panels 70, 71 (Figs. 8, 9 and 12).

As the carton C moves into contact with the end portions of the squeeze cams 139, the lateral edges 140 of the cams 139 exert opposed inward thrusts on the side roof panels 70, 71 at or immediately below the score line 66. As the carton C continues its traverse through the preformer, these thrusts, coupled with the downward thrust produced by the widening portion 138 of the hold down cam, infold the side roof panels 70, 71 and at the same time outfold their associated top flange panels 70A, 71A, as shown in Fig. 9. The major top flaps 82, 89 remain upright and simply fold through an angle of about 90° about the respective score lines 84, 88 connecting them with their associated top flange panels. The panels also result in folding the fractional panel areas 72A and 79A against the inside faces of the side roof panel 70 and the top flange panel 70A, the fractional panels 72A, 79A simply outfolding with the top flange panel 70A.

Similarly, the fractional panel areas 74A, 78A simply fold against the inside faces of the side roof panels 71 and its associated top flange panel 71A, the areas 74A, 78A outfolding with the top flange panel 71A. Upon completion of the foregoing manipulations, the roof panels and the top flange of the carton C are in the condition illustrated in Figs. 9 and 10.

In order to insure full breaking of the top closure parts about the proper score lines during the preforming operations just described, and also to preclude inward deformation of one or more of the carton side panels, provision is made for subjecting the inside of the carton C to a blast of compressed air during the severest period of the preforming operation. In furtherance of this objective, the hold down cam 126 is provided with an air line 142 terminating in a discharge aperture in the widening portion 138 of the cam 126. The line 142 is connected with an intermittently operated air valve (not shown) which may be opened and closed in timed relation with the motion of the preformer conveyor 105. Since the portion 138 of the hold down cam at that particular point covers the entire top opening of the carton C, it will be appreciated that the air blast from the line 142 is sufficient to place the entire carton under sufficient internal pressure to offset deformation during preforming of the top closure.

After roof panels 68, 69, 70 and 71 have been infolded and the flange panels 68A, 69A, 70A, 71A have been outfolded, the carton is traversed further until its upstanding inside top flap 82 is accosted by a stationary turn down cam 145 (Figs. 13 and 14). The latter has an abruptly tapered edge 146 which exerts a progressively increasing force on the top flap 82 tending to fold the same downwardly about the score line 84 and against the adhesive coated faces of the outfolding top flange panels 68A, 69A, 70A and 71A. Fixed to the wider end of the cam 145 is a hold down shoe 148 which also has a tapered lateral edge 149. The shoe 148 exerts an upward pressure on the flap 82 and the underlying top flap. This pressure continues even after the carton C has left the preformer unit 56.

Provision is made in the preformer unit 56 for maintaining the outside flap 89 in an upstanding position clear.
of the parts which manipulate the other members of the carton top closure. This is accomplished by the use of a pair of closely spaced, longitudinally disposed guide bars (Figs. 9 and 13) extending from the entrance of the preformer unit 56 almost to the exit thereof. The guide bars 150, 151 terminate immediately adjacent a printer mechanism 152. The latter comprises a printing roll 154, having a date or other appropriate indicia thereon, and a backup roll 155 adapted to bear against the inside face of the top flap 82 while the roll 154 applies printing to the outside face of the flap 89. The guide bars 150, 151 are so arranged that the flap 89 will be fed directly between the rolls 154, 155 as the carton C is traversed thereunder by the preformer conveyor 155.

The moving parts of the top preformer unit 56 are driven in timed relation with each other and with the preformer conveyor 105. Referring in particular to Figs. 13 and 14, it will be noted that the rotary breaker 121 is fixed to the lower end of an upright spindle 160 journaled in the gear box 118 as by means of antifriction bearings 161. At its upper end, the spindle 160 has rigidly thereto a sprocket wheel 162. Similarly, the rotary breaker 122 is fixed to the lower end of an upright spindle 164 journaled in gear box 118 as by means of antifriction bearings 165. A sprocket wheel 166 is keyed or otherwise rigidly fixed to the upper end of the spindle 164. The breakaway sprocket wheels 162, 164 driven in unison as by means of chain 168 which meshes with a sprocket wheel 170 fixed to a relatively short vertical shaft 171. The latter is journaled in the gear box 118 by means of bearings 172.

Fixed to the shaft 171 intermediate the bearings 172 is a bevel pinion 174. The latter drivingly meshes with a similar pinion 175 fixed to a relatively short transverse shaft 176. The shaft 176 is journaled in the gear box 118 as by means of bearings 178 and has drivingly fixed to its outer end the notched folder wheel 128 (Fig. 15).

Power is supplied to the vertical shaft 171 through sprocket wheel 179 mounted adjacent its upper end portion and in close proximilily to the sprocket wheel 170. The wheel 179 drivingly meshes with a chain 180 which is led over an idler 181 and engages sprocket wheel 182, the latter driving the printer mechanism 152. The chain 180, in turn, is driven from a sprocket wheel 184 mounted on the upper end of a vertical shaft 185, the latter being journaled partially in the gear box 118 and partially in the machine base 51.

Terminal sheave and transfer mechanism

Turning now to Figs. 1, 2, 20 and 21, it will be perceived that the preformer conveyor 105 passes from the discharge end of the top preformer unit 56, thence about a terminal sheave 190, and returns to the body forming unit 55 via a reverse path. The terminal sheave 190 (Fig. 1) is mounted on an upstanding shaft 191 journaled in the machine base 51. The carton supporting table 106 continues through the preformer unit 55 and terminates in a relatively wide transfer platform 192. The guide rails 116 of the preformer unit also extend beyond the discharge end thereof and describe a wide arc about the terminal sheave 191. Located inwardly from the arcuate portions of the guide rails 116 are one or more vertically aligned guide rails 193. The latter are spaced to enter the carton conveying buckets 108 and are disposed so as to gradually cam each carton C out of its associated bucket after approximately 90° travel of the latter about the terminal sheave. As clearly indicated in Figs. 20 and 21, the guide rails 193, 116 together define a carton path which passes about the shaft 191 through an angle of approximately 90°, thence departing tangentially toward a terminal point. The hold down shoe 148 extends from the discharge end of the preformer unit 56 and has a curved portion 194 extending along this arcuate carton path.

Each carton C is traversed along this arcuate path with its infolded front roof panel 68 in the lead and its inner top flaps 82 held down against the top flange of the carton by the shoe 148 (Fig. 17). The outer top flap 89, disposed in a vertical plane as it left the printer, now cams under the outer marginal edge of the curved portion 194 of the hold down shoe 148. This holds the flap 89 into a horizontal, bottom-up position, as indicated in Fig. 17, breaking reversely about the score line 88. The flap 89 remains in this position until the carton C starts to cam out of its conveyor bucket 108, at which time the flap 89 moves out from under the shoe portion 194 and the natural spring of the paperboard restores it to approximately a vertical position.

Fixed to the upper end of the terminal sheave shaft 191 is a disk 195. The latter carries a series of projecting spokes 196 each having a rearwardly inclined abutment 198 adjacent its projected end. These parts are so proportioned that one of the abutments 198 will be brought into overlying relation with the trailing portion of the inner top flap 82 of each carton as it starts to cam out of its conveyor bucket 108 (see Fig. 20). With further movement of the carton C along its arcuate path, a finger 200 carried by top closing turret 201 accosts the outer face of the upstanding outer top flap 89 and folds the same downwardly about the score line 88 and into overlying relation with the previously downfolded inner top flap 82 driven in unison as by means of chain 168 which meshes with a sprocket wheel 201 fixed to a relatively short vertical shaft 171. The latter is journaled in the gear box 118 by means of bearings 172.

The top closing turret 201 is provided with a plurality of carton cages 202 each adapted to receive a carton as it departs from its tangential path about the terminal sheave. Each cage 202 comprises a base block 204 rigidly fixed to a suitable flat 205 on the outer surface of the turret body 206. Projecting outwardly from the block 204 are a pair of vertically aligned, trailing abutment pins 208 and a pair of similarly spaced leading abutment pins 209 of somewhat shorter length, the pins 208 and 209 being spaced apart horizontally a distance slightly greater than the cross-sectional dimension of the carton C.

To achieve positive transfer of each carton C across the transfer platform 192 and thence into an associated one of the cages 202, a pusher bar 210 is provided. This bar, which may actually be constructed as two or more vertically aligned bars, is pivotally connected as at 211 to a pair of twin cranks 212. The latter are driven in unison and move the bar 210 in an orbital path, causing it to sweep each carton laterally from its tangential path about the terminal sheave and into the adjacent one of the carton cages 202 on the top closing turret. To facilitate such transfer, the end portions of the guide rails 116 which partially define the tangential carton path terminate substantially before the ends of the rails 193 and the end of such path. The pusher bar 210 is of course situated so that it will clear both the guide rails 116 and 193.

Top closing turret

The top closing unit 58 comprises the top closing turret 201, together with its supporting and driving means. Referring in particular to Fig. 22, it will be noted that the turret 201 is journaled on the machine base 51 for rotation about a generally upright axis. Accordingly, a hollow upstanding column or pindle 215 is secured to an appropriate footing 216 within the machine base 51 and constrained against rotation as by means of a key 218. The turret body 206, which is of barrel-like form, has a central internal sleeve 219 integral therewith, the bore 220 of the sleeve being substantially larger in diameter than the outer diameter of the pindle 215. The body 206 is rotatably supported from the pindle 215 by means of a pair of vertically spaced antifriction bearings 221, 222 adapted to withstand both radial and axial loading, such bearings being positioned by suitable locating shoulders in both
the pintle 215 and the sleeve 219. Power to rotate the turret 201 is transmitted thereto by ring gear 224, the latter being secured to the bottom of the turret body 206 as by means of a series of cap screws 225. As to the latter, the turret body 206 has a relatively heavy head flange 226 which carries a plurality of circumferentially spaced closure heads 228, each of the latter comprising a heater and jaw assembly for activating the adhesive of the carton top closure. Each closure head 228 has an upper housing 229 with a mounting flange 230 for retention of the closure head 228. The ring flange 226. Each housing 229 has a lower portion which fits snugly into a bore 231 running vertically of the head flange 236.

Mechanical actuation of each closure head 228 is accomplished by the use of a pressure cam 252 and a jaw cam 234. Both of these cams are of annular shape, being fixed to the upper portion of the pintle 215 and constrained against rotation as by means of key 235. In this instance, the jaw cam 234 is somewhat smaller in diameter than the pressure cam 252 and situated in vertically spaced relation overlying therewith. The cam 232 has a cam track 232A in its upper face, while the cam 234 has a cam track 234A in its upper face.

For the purpose of supplying electric power to the heater elements of the closure head 228, a slip ring and brush assembly 235 is interposed between the fixed upper end of the pintle 215 and the mechanism which rotates with the turret 201. In the present instance, a sleeve 238 is keyed on the upper end of the pintle 215 and retained thereon as by means of a nut 239. The sleeve 238 carries a plurality of slip rings 240 separated by annular insulators 241, all such members being held together by machine screws 242. The slip rings 240 are electrically connected to the rotary turret 201, and to the electrical parts moveable therewith, by means of a plurality of brushes 244 carried by brush head 245, the latter being rigidly secured to the housing 229 of one of the closure heads 228. Electrical power is supplied to the slip ring and brush assembly 235 via a conduit 246 running axially of the pintle 215 and terminating in a cap fitting 248 secured to the top of the pintle 215.

Lubricant for the mechanisms mounted at the top of the pintle 215 and in the upper portion of the turret 201 is supplied via an oil line 249 also running axially of the pintle 215 and terminating in the cap fitting 248. The latter is connected to the pump 250 which is a rotary tube oil distributor cap 251, the latter being adapted to feed pressurized lubricant to the various mechanisms in the upper portion of the turret as by means of lines 252.

All of the members mounted on the upper portion of the pintle 215 and the head flange 226 of the turret 201 are housed within a convex protective cover 254 detachably secured in place as by means of a knob fitting 255 having threaded engagement with the tube oil distributor cap 251.

Turning now to the closure heads 228 (Figs. 23–32), it will be perceived that each of the same has a heated pressure pad 256 centrally mounted in depending relation below the turret head flange 226, together with four heated, pivotally mounted jaws 258, 259, 260 and 261 disposed in surrounding relation with the pressure pad 256. The closed pad 250 which is a rotary tube oil distributor cap 251, the latter being adapted to feed pressurized lubricant to the various mechanisms in the upper portion of the turret as by means of lines 252.

Referring primarily to Figs. 23, 24, 25 and 27, it will be noted that the jaws 258, 259, 260 and 261 are fixed respectively to the lower depending ends of hollow jaw spindles 262, 263, 264 and 265 terminated in suitable 70 bearings within the closure head 228 for oscillation about a substantially vertical axis. Each of these spindles may be susceptible of a limited amount of yieldable vertical movement in opposition to a coiled compression spring 266 surrounding its upper end portion.

Provision is made for effecting controlled oscillation of the jaws 258, 259, 260, 261 in timed relation to the rotation of the body closing turret 201 and the movement of the procession of cartons C being transferred from the loading end to the latter. In furtherance of such objective, the spindles 262, 263, 264 and 265 have keyed or otherwise rigidly fixed to their respective upper ends a series of gear segments 268, 269, and 270. The latter mesh with a common pinion 271 integral with a sleeve 272 which is journaled in antifriction bearings 274 located in the upper central portion of the closure head 228 (Figs. 23 and 24). The foregoing members are oscillated in unison by means of a cam actuated rack 275 meshing with a second set of teeth on the gear segment 270. The rack 275 is slidably mounted in a guideway 276 integral with the housing 229. A cam follower 278 also slidably mounted in the guideway 276 has a yieldable connection with the rack 275 through a coiled compression spring 279, the follower 278 being adapted to displace the rack outwardly from the center of rotation of the top closing turret and in opposition to a yieldable biasing means tending to maintain the jaws in an open position. At its end remote from the rack 275, the follower 278 carries a follower roller 280 which rides in the track 234A of the jaw cam 234 (Figs. 22, 23 and 24). The extent of oscillatory movement imparted by the rack 275 to the gear segments 270, 269, and 268 may readily be adjusted by means of a set screw 281 which bears against one face of the gear segment 270.

The jaw 261, as shown particularly in Figs. 25 and 27, must oscillate through a greater angle than other jaws to permit a carton C to be received in its associated cage 202 and to move into underlying relation with the pressure pad 256. This is accomplished in the present instance by the use of a step-up segment 283 integral with or fixed to the sleeve 272 below the pinion 271, the segment 282 being of somewhat greater diameter than the pinion 271. The segment 282 drivingly meshes with a pinion 284 fixed to the upper end of the body spindle 265. Due to the mechanics of the gearing, the spindle 265 and its associated jaw 261 are moved through a substantially greater angle than the remaining spindles and jaws in response to a given displacement of the rack 275.

When swung inwardly, the jaws 258, 259, 260 and 261 are adapted to grip the carton C under its top flange and to hold such flange against the heated pressure pad 256 to effect activation of the carton top closure. To this end, the jaw 258 is equipped with angular shoe 285 adapted to bear complementally against the front roof panel 68 and the top flange panel 69A. The opposite jaw 260 is provided with a similar shoe 286 adapted to bear against the rear roof panel 69 and the underside of the top flange panel 69A. In like manner, the jaw 259 is equipped with a shoe 288 which abuts against the side roof panel 70 and its associated top flange panel 70A, while the jaw 261 has a shoe 289 adapted to abut against the side roof panel 70 and associated top flange panel 70A. Due to the structure of the carton top closure, it will be noted that the shoes 288, 289 are substantially longer than the shoes 285, 286 (Figs. 25, 27 and 31).

Provision is made for heating the jaw shoes 285, 286, 288 and 289 to speed up the adhesive activation process. This is accomplished with the use of a plurality of thermostatically controlled electrical heaters 290, one heating each jaw. Electric power for the respective jaw heaters 290 may readily be supplied thereto from a conduit 291 terminating at the top of each jaw spindle. The wiring from the conduit may readily be led to the associated heater 290 via a hollow of the jaw spindle and a passage in the jaw.

Turning now to the pressure pad 256, it will be noted upon reference to Figs. 26, 28, 30 and 31 that the pad 256 is electrically heated by a pair of thermostatically controlled heaters 293 housed within respective bores 293A.
The pad 256 has a bottom face corresponding in area to the top of the carton but is constructed so as to avoid heating and downward pressure on the carton flange 98 with less than the frictional resistance of the adhesive coating thereon. This is accomplished by forming the pad 256 with a relatively large central recess 292 adapted to receive the filling flap 98 and to maintain the same in upstanding relation out of contact with the surrounding portions of the pad 256. To ensure proper entry of the filling flap 98 into the recess 292 as the carton C is transferred under the pad 256, an upwardly tapering, rounded off cam block 294 is mounted in radially projecting relation from the pressure pad 256, being supported as by means of brackets 295, 296. The cam 294 is proportioned so as to catch the open filling flap 98 as the carton is pushed into its associated turret cage 202 and to present the flap 98 in an open condition to an adjacent tapered nose 298 also projecting radially from the pressure pad 256. The nose 298 cams the filling flap 98 into substantially a vertical position and thus guides it between the closely spaced walls at the lower end of the recess 292.

As the carton is transferred into the cage 202, steps are taken to fold the fractional panels 91, 92, 94 about their associated score lines to define the gripping tab and release latch of the carton. This is accomplished by the use of an upwardly inclined finger 299 mounted on jaw 258 (Figs. 18 and 26). Thus as the carton moves into the cage 202, the projecting tab panels 92, 94 are accosted by the finger 299 and are broken downwardly about the score line 95. When the carton has reached its position of underlying relationship with the pressure pad 256, the jaw 258 closely aligns with the others and the free lower end of the finger 299 exerts a sort of tucking action, forcing the panels 92, 94 up against the adhesive coated underside of the projection 85 and the underside of the front flange panel 68A. In order to facilitate activation of the thermoplastic adhesive formation of a top closure of adequate strength, provision is made for yieldably pressing the pressure pad 256 downwardly so as to squeeze the carton top flange against the infolded jaw shoes 285, 286, 288 and 289. In furtherance of such objective, the pressure pad 256 is supported from a central plunger 300 which is capable of a limited amount of vertical sliding movement in the top closure head 228. The plunger terminates at its lower end in a rectangular flange 301 adapted to bear against and to slide along a vertical guide 302 (Fig. 29). The flange 301 has a lost motion connection with the pressure pad 256, with the latter being constrained to move along vertical guide 302. Such lost motion connection comprises a pair of opposed, inverted T-plates 304, 365 which respectively engage abutments 306, 368 projecting laterally from the pad 256. A relatively short, spring-loaded plunger 309 housed within the lower end of the central plunger 300 bears against the top of pressure pad 256 and maintains the latter in slightly spaced relation with respect to the flange 301.

After closure of the jaws 258, 259, 260 and 261, the central plunger 300 is given a rigid downward thrust, pressing the pad 256 against the top flange of the carton with a correspondingly rigidizable, although yieldable, thrust. This is accomplished by a pair of toggle links 310 (Fig. 23) connected between the upper end of the plunger 300 and a central compression strut 311 anchored in the upper portion of the top closure head 228. The toggle links 310 are actuated by means of a thrust link 312, the latter being pivotally secured to a cam follower 314 slightly mounted in a guide way 315 in the housing 229. At its free end, the follower 314 is provided with a follower roller 316 which engages track 323A of pressure cam 322. To assure completion of the gripping and releating tab associated with the lift flap of the carton, the inverted T-plate 304 is made with a downwardly extending lower edge portion 318 which is bent outwardly at a small angle. As the downward squeeze of the pressure pad 256 against the top flange and the underlying jaw shoes occurs, the overlapping piles defining the gripping tab of the carton is in unison with a substantially horizontal position to a downwardly inclined position lying almost in the plane of the leading side panel of the carton (Fig. 31).

After about 270° of rotation on the top closing turret 201, the adhesive in the top flange in each carton has been thoroughly activated and the top closure of the carton has been completed except for sealing down the filling flap 98. As the cartons approach the discharge conveyor 59, the jaws 258, 259, 260 and 261 open and the bottom of each carton is brought into contact with a discharge platform (not shown) which raises each carton through a slight distance to break any possible adhesion it might have with the jaws. Each succeeding carton is brought into contact with a pair of guide rails 319 which cam it out of the carton cage 202 on the turret and transfer it to the discharge conveyor 59. The latter receives each carton in the condition shown in Fig. 33 and transports the same to a suitable coating and sterilizing machine.

**Main drive**

Referring now to Figs. 1 and 2, the machine 50 is powered by a main drive motor 320 housed within the base 51. The motor 320 is connected by means of belts 321 and pulley 322 to a high-speed shaft 324 journeled in the machine base 51. The shaft 324 carries a worm 325 which meshes with worm wheel 328, the latter being drivingly mounted on a line shaft 329. The line shaft 329 has a bevel pinion 330 fixed adjacent one end thereof and disposed in meshed engagement with a similar bevel pinion 331. The latter is fixed to the lower end of a relatively short vertical shaft 332 journeled in the machine base 51 (Fig. 22). At its upper end, the shaft 332 carries a drive pinion 334 which meshes with the ring gear 224 of the top closing turret 201.

The shaft 334 has fixed thereto a sprocket 335 which drives a horizontal loop of chain 336. The chain 336 meshes with a sprocket 338 which drives the conveyor terminal sheave shaft 191, and also meshes with a sprocket 339 fixed to the lower end of the preformer unit drive shaft 185. The chain 336 also drives the pusher bar 210 via an appropriate sprocket (not shown) and an upright shaft 340.

**Synopsis of operation**

In view of the detailed description presented earlier herein, it is believed that the operation of the machine 50 will be obvious at this point to those skilled in the art.

To recapitulate briefly, however, it will be noted that the top preformer unit 56 receives a procession of formed carton bodies with closed bottoms and open tops, each in the condition shown in Fig. 3. The preformer conveyor 165 moves each carton through the top preformer unit 56. Rotary breaker fingers 124, 125 coat with notched wheel 128 and hold down cams 126, 131 to infold the front and rear roof panels 68, 69 and outfold their respective top flange panels 68A, 69A. The hold down cam 126, cooperating with a pair of stationary squeeze cams 139, subsequently infolds the side roof panels 70, 71 and outfolds their respective top flange panels 70A, 71A, the carton being pressurized internally at this time by a blast of air from air line 242. As each carton nears the end of the top preformer unit, the inner top flap 82 is downfolded due to contact with a fixed turn down cam 145 and a hold down shoe 148. The carton subsequently passes under a printer mechanism 152 which, otherwise marks the outside face of its upstanding outer top flap 89.

Upon leaving the top preformer unit 56, the outer top flap 89 of each carton is reversed broken about its hinge line and then permitted to spring back to upstanding position. The carton progresses along an arcuate
path about the conveyor terminal sheave and at the same time gradually cams out of its associated conveyor incident to and at the same time gradually camms out of its associated conveyor sheave. The conveyor 201, coacting with a rearwardly inclined abutment carried by the terminal sheave disk 195, downfolds the upper top flap 89 but leaves the filling flap 98 in an open condition.

Each carton is then forwarded to a receiving cage 202 fixed to the top closing turret 201, being traversed across transfer platform 192 by pusher bar 210. Cam elements 294, 298 guide the filling flap 98 into protective recess 292 in a heated pressure pad 256 carried by an associated top closure head 226 on the turret. At the same time, the keeping tab and relocking flap projections on the top flap 89 are folded inwardly by a downwardly inclined finger 299 also carried by the top closure head 228. After this has occurred, a plurality of heated jaw shoes 285, 286, 288, and 289 are brought to bear against undersides of the top flange panels and a toggle actuated plunger 300 exerts a yielding downward thrust on the pressure pad 256 so as to squeeze the top flange panels against the jaw shoes.

After about 270° of revolution of the top closing turret 201 the jaws commence to open and the carton is raised slightly upwardly and cammed then out of its cage 202 by guide rails 319. The carton, in the condition shown in Fig. 33, is then presented to the discharge conveyor 59.

We claim as our invention:

1. In a machine for making flat-topped cartons of preformed bodies of cardboard or the like from preformed bodies having top closure parts defined therein and selectively coated with thermoplastic adhesive, each said body having roof panels, top flange panels, an inner top flap having a filling and pouring opening therein, and an outer top flap having a filling flap therein, the combination of a base, a body forming unit mounted on said base, a conveyor adapted to receive preformed carton bodies in a progression from said body forming unit, a top preformer unit adapted to infold the roof panels and to outfold the top flange panels of carton bodies traversed therethrough by said conveyor, said preformer unit also being adapted to fold down said inner top flap of each carton, a top closing turret mounted on said base for rotation about an axis generally parallel to said conveyor, and means on said conveyor for receiving successively a plurality of carton bodies, means for transferring the cartons successively to said turret, means for outfolding the upper top flap of each carton as an incident to transfer to said turret but without closing the filling flap thereof, a plurality of top closure heads fixed to said turret and each adapted to apply heat and pressure to the top flange panels and downfolded top flaps of an associated carton body to activate the thermoplastic adhesive thereon, and means in each said closure head for precluding application of heat and pressure to the filling flap of the carton associated therewith.

2. In a machine for making flat-topped cartons of preformed bodies of cardboard or the like from preformed bodies having top closure parts defined therein and selectively coated with thermoplastic adhesive, each said body having roof panels, top flange panels, an inner top flap having a filling and pouring opening therein, and an outer top flap having a filling flap therein, the combination of a base, a body forming unit mounted on said base, a conveyor adapted to receive preformed carton bodies in a progression from said body forming unit, a top preformer unit adapted to infold the roof panels and to outfold the top flange panels of carton bodies traversed therethrough by said conveyor, said preformer unit also being adapted to fold down one of the opposed top flaps of each carton, a top closing turret mounted on said base for rotation about a generally upright axis, means on said turret for receiving successively a plurality of carton bodies, means for transferring the cartons successively to said turret, means for outfolding the upper top flap of each carton as an incident to transfer to said turret but without closing the filling flap thereof, a plurality of top closure heads fixed to said turret and each adapted to apply heat and pressure to the top flange panels and downfolded top flaps of an associated carton body to activate the thermoplastic adhesive thereon, and means in each said closure head for precluding application of heat and pressure to the filling flap of the carton associated therewith.

3. In a machine for making flat-topped cartons from preformed bodies of cardboard or the like selectively coated with thermoplastic adhesive, each said body having roof panels, top flange panels and a pair of opposed top flaps, the combination of a machine base, a carton conveyor, means for infolding opposed pairs of roof panels and outfolding corresponding opposed pairs of top flange panels of cartons traversed by said conveyor, means for infolding certain other opposed pairs of roof panels and outfolding certain other opposed pairs of top flange panels of cartons traversed by said conveyor, means for downfolding one of said opposed top flaps of each carton traversed by said conveyor, a top closing turret rotatably mounted on said machine base, a carton conveyor, means for receiving individually a plurality of cartons from said conveyor, a plurality of top closure heads on said turret for activating the thermoplastic adhesive on said top flange panels and said top flaps by application thereto of heat and pressure, and a finger carried by said turret for downfolding the other one of said top flaps in each carton as an incident to transfer of the carton to said turret.

4. In a machine for making flat-topped cartons from preformed bodies of cardboard or the like selectively coated with thermoplastic adhesive, each said body having roof panels, top flange panels and a pair of opposed hinged top closure flaps, the combination comprising a machine base, a carton conveyor, a conveyor adapted to receive preformed carton bodies in a progression from said body forming unit, a top preformer unit adapted to infold the roof panels and to outfold the top flange panels of each carton as an incident to transfer to said turret but without closing the filling flap thereof, a plurality of top closure heads fixed to said turret and each adapted to apply heat and pressure to the top flange panels and downfolded top flaps of associated carton bodies to activate the thermoplastic adhesive thereon, and means in each said closure head for precluding application of heat and pressure to the filling flap of the carton associated therewith.

5. In a machine for making flat-topped cartons from preformed bodies of cardboard or the like selectively coated with thermoplastic adhesive, each said body having roof panels, top flange panels and a pair of opposed hinged top closure flaps, the combination comprising a machine base, a carton conveyor, a conveyor adapted to receive preformed carton bodies in a progression from said body forming unit, a top preformer unit adapted to infold the roof panels and to outfold the top flange panels of each carton as an incident to transfer to said turret but without closing the filling flap thereof, a plurality of top closure heads fixed to said turret and each adapted to apply heat and pressure to the top flange panels and downfolded top flaps of associated carton bodies to activate the thermoplastic adhesive thereon, and means in each said closure head for precluding application of heat and pressure to the filling flap of the carton associated therewith.
6. In a machine for making flat-topped cartons from preformed bodies of paperboard or the like having roof panels, top flange panels and a pair of opposed hinged top closure flaps, a top performer unit comprising the combination of a carton conveyor, means including a pair of rotary breakers for infolding a first opposed pair of roof panels and means including a pair of hold down cams for infolding a first corresponding opposed pair of top flange panels of cartons while they are being and as a result of their being traversed by said conveyor, means including a pair of converging stationary squeeze cams for infolding certain other opposed pairs of roof panels and infolding other corresponding opposed pairs of top flange panels of cartons while they are being and as a result of their being traversed by said conveyor, and stationary means for downfolding one of the opposed top flaps of each carton as a result of the latter being traversed by said conveyor.

7. In a machine for making flat-topped cartons of paperboard or the like from preformed bodies having open tops with closure parts defined therein, a top performer unit comprising, in combination, a carton conveyor longitudinally of said preformer unit, said rotary breaker having a retarding finger and the other of said breakers having an accelerating finger, a pair of longitudinally spaced hold down cams disposed in overlying relation with said breakers, a wheel rotatable in a plane lying at right angles to the plane of rotation of said breakers, said wheel having at least one radial abutment therein and disposed for coaction with one of said hold down cams and said retarding breaker in manipulating a top closure element of each carton passing thereunder, means for driving said rotary breakers and said hold down cam in timed relation with each other and with said carton conveyor, a pair of stationary squeeze cams disposed in straddling relation with one of said hold down cams, and a turn down cam fixed adjacent the end of said one hold down cam remote from said wheel.

8. In a machine for making flat-topped cartons of paperboard or the like from preformed bodies having open tops with closure parts including an outer top flap defined therein, a top performer unit comprising the combination of a carton conveyor, a pair of rotary breakers, one of said breakers having a retarding finger and the other of said breakers having an accelerating finger, a pair of longitudinally spaced hold down cams disposed in overlying relation with said breakers, a pair of stationary squeeze cams disposed in straddling relation with one of said hold down cams, and a turn down cam fixed adjacent the end of said one hold down cam, adapted to be swung in closely spaced relation beneath the other of said hold down cams, a folder wheel having a peripheral groove adapted to straddle said hold down cams, said folder wheel having abutments on one side of said peripheral groove, the carton conveyor, and means for driving said folder wheel and said carton conveyor in timed relation with each other.

9. In a machine for making flat-topped cartons from preformed bodies of paperboard or the like having roof panels, top flange panels and a pair of opposed hinged top closure flaps, a top performer unit comprising, in combination, a carton conveyor, a pair of rotary breakers for infolding a first opposed pair of roof panels and means including a pair of converging stationary squeeze cams for infolding certain other opposed pairs of roof panels and infolding other corresponding opposed pairs of top flange panels of cartons while they are being and as a result of their being traversed by said conveyor, and stationary means for downfolding one of the opposed top flaps of each carton as a result of the latter being traversed by said conveyor.

10. In a machine for making flat-topped cartons from preformed bodies of paperboard or the like, each said body having front and rear roof panels respectively connected with front and rear top flange panels, each said body also having side roof panels respectively connected with associated top flange panels, a top performer unit comprising, in combination, a carton conveyor, a hold down cam mounted in overlying relation with said conveyor, said hold down cam having a progressively widening portion, means for infolding the front and rear roof panels and forcing said front and rear top flange panels under said hold down cam in outfolded relation, and a pair of squeeze cams having converging inner surfaces situated adjacent the widening portion of said hold down cam, said squeeze cams and said hold down cam being adapted to infold said side roof panels and simultaneously outfold their associated top flange panels.

11. In a machine for making flat-topped cartons from preformed bodies of paperboard or the like, each said body having front and rear roof panels respectively connected with front and rear top flange panels, each said body also having side roof panels respectively connected with associated top flange panels, a top performer unit comprising, in combination, a carton conveyor, a hold down cam mounted in overlying relation with said conveyor, said hold down cam having a progressively widening portion, means for infolding the front and rear roof panels and forcing said front and rear top flange panels under said hold down cam in outfolded relation, a pair of squeeze cams having converging inner surfaces situated adjacent the widening portion of said hold down cam, said squeeze cams and said hold down cam being adapted to infold said side roof panels and simultaneously outfold their associated top flange panels, an air discharge aperture in said progressively widening portion of said hold down cam, and means for periodically discharging a blast of air from said aperture into an underlying carton to preclude deformation of its body.

12. In a machine for making flat-topped cartons of paperboard or the like from preformed bodies having top flange panels and closure parts defined therein, a top performer unit comprising, in combination, a carton conveyor, a pair of stationary squeeze cams disposed in straddling relation with one of said hold down cams, a turn down cam fixed adjacent the end of said one hold down cam, adapted to be swung in closely spaced relation beneath the other of said hold down cams, a folder wheel having a peripheral groove adapted to straddle said hold down cams, said folder wheel having abutments on one side of said peripheral groove, a lifter cam fixed to said table beneath said folder wheel and said rotary breakers, and means for driving said rotary breakers and said folder wheel and said carton conveyor in timed relation with each other.

13. In a machine for fabricating flat-topped cartons from preformed bodies of paperboard or the like having top closure elements selectively coated with thermoplastic adhesive and including inwardly slanted roof panels and outfolded flange panels together with top flaps outfolding the flange panels, the combination comprising a base, a
hollow upstanding pintle fixed to said base, a top closing turret journaled on said pintle for rotation about a generally upright axis, a plurality of caged spindles mounted on said turret for receiving carton bodies and rotatably translating the same, a plurality of top closure heads mounted on said turret in superposed relation to respective ones of said cages and having shoes movable axially of the carton bodies for applying heat and pressure to the top flaps of cartons engaged thereby, said heads each further including a plurality of jaws rotatable about vertical axes into backing relation beneath the flange panels when pressure is applied to the top flaps, means for applying power to said turret to rotate the same, and cam means fixed to said pintle for axially actuating said top closure shoes and rotatably actuating said jaws in timed relation with the rotation of said turret.

14. In a machine for fabricating flat-toppered cartons of paperboard or the like from preformed bodies which have inwardly slanted roof panels and outfolded flange panels together with top flaps overlying the flange panels, the combination comprising a base, a hollow upstanding pintle fixed on said base, a top closing turret body, bearing means interposed between said turret body and said upstanding pintle, a head flange at the upper end of said turret body and integrally fixed thereto, a plurality of top closure heads mounted on said head flange having heated pressure elements depending in axially slidable relation therefrom below said flange for engagement with the top flaps of each carton, said heads each further including a plurality of jaws rotatable about vertical axes into backing relation beneath the flange panels when pressure is applied to the top flaps, a series of carton receiving cages mounted on said body and each associated with one of said top closure heads, a pair of cams fixed to the upper portion of said pintle, means connecting said cams and said top closure heads for actuation of said heated pressure elements and said jaws, respectively, and a brush and slip ring assembly having one portion fixed on the upper end portion of said pintle and another portion fixed on a member bodily rotatable with said head flange, electrical conduit means running through said hollow pintle for connecting said one slip ring assembly portion to an electrical power source, and means electrically connecting said other slip ring assembly portion to the heated pressure elements of said top closure heads.

15. In a container fabricating machine of the character set forth and adapted to complete a succession of cartons each having inwardly inclined roof panels, outfolded top flaps, and top closure head comprising, in combination, a centrally disposed pressure pad adapted to bear against the top flaps of the carton, thermostatically controlled heating means in said pressure pad, a plurality of jaws swingable about spaced axes perpendicular to the plane of the flange panels, said jaws being swivelled into positions adjacent the respective inclined roof panels and thus into backing engagement with the undersides of said outfolded flange panels, said jaws each further having means adapted to bear against the underside of the carton top flange panels, means for oscillating said jaws in unison about their respective axes including means for moving one of said jaws through a greater angle than the others to permit entry of a carton laterally between the jaws, thermostatically controlled heating means in each of said jaws, and means for applying a resilient squeeze of the top flaps against the flange panels of said carton by relative axial pressure between said pressure pad and said jaws.

16. In a container fabricating machine of the character set forth and adapted to complete a succession of cartons each having a top flange with a pair of top flaps downfolded thereon, a top closure head comprising the combination of a housing, a plurality of jaw spindles journaled in spaced parallelism on the axis of the head, a plurality of carton flange engaging jaws fixed to respective ones of said spindles, a common actuating means for oscillating said spindles about their longitudinal axes to open and close said jaws in a plane transverse to said axes, gear connections between certain ones of said spindles for oscillating the same through a uniform angular displacement, and a gear connection between said common actuating means and a remaining one of said jaw spindles for oscillating the same through a substantially greater angular displacement to thereby permit transverse entry of a carton into embraceable relation with all of said jaws.

17. In a machine for closing the top of an erected carton body having four roof panels, four upstanding flange panels and two opposed top flaps, the combination of a table surface for supporting the body, means for continuously advancing the carton body in a lateral direction parallel to the planes of its upstanding top flaps, a first hold down cam superposed above the table a distance leaving clearance between its underside and the upstanding carton flange panels, a second hold down cam spaced from the first cam in the direction of carton body movement and spaced above the table surface a distance to hold the carton flange panels folded downwardly from the roof panels, a lift cam surface on the table surface between the two hold down cams for elevating the carton body after its leading flange panel but before its trailing flange panel has passed the first hold down cam, a rotary wheel having a non-circular periphery for outfoiling the leading flange panel forwardly and tucking it beneath the second hold down cam, said wheel being formed to clear the trailing flange panel as it advances so that the latter is outfolded rearwardly by the two cams.

18. In a machine for closing the top of an erected carton body having two flange panels upstanding from and connected by foldlines to opposite sides of the carton body, the combination comprising means for continuously moving the carton body in a direction at right angles to the planes of the upstanding panels, a first hold down cam spaced above the path of carton movement to leave slight clearance from the upstanding panels, a second hold down cam spaced apart from the first cam in the direction of carton movement and spaced above the path of such movement a distance to hold the panels downfolded about their foldlines, means for elevating the carton body slightly after the leading panel has cleared but before the trailing panel has cleared the first hold down cam, means for outfoiling the leading panel in the direction of carton movement while such panel is between said two cams and without disturbing the trailing panel, so that the leading and trailing panels are outfolded forwardly and rearwardly, respectively, as the carton is moved beneath the second hold down cam.

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