

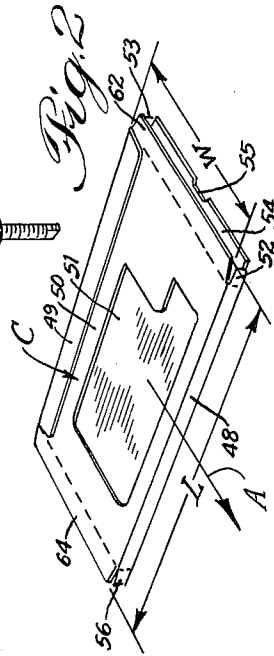
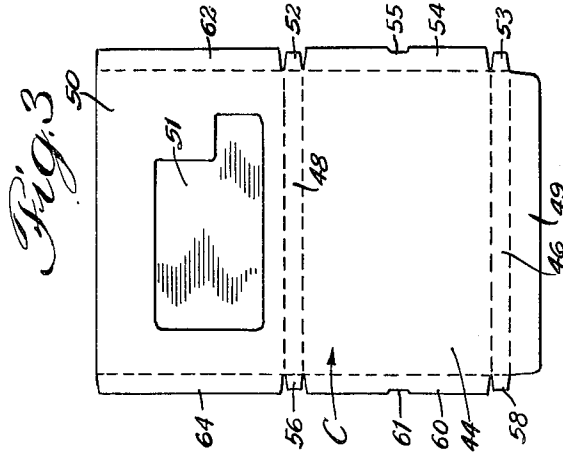
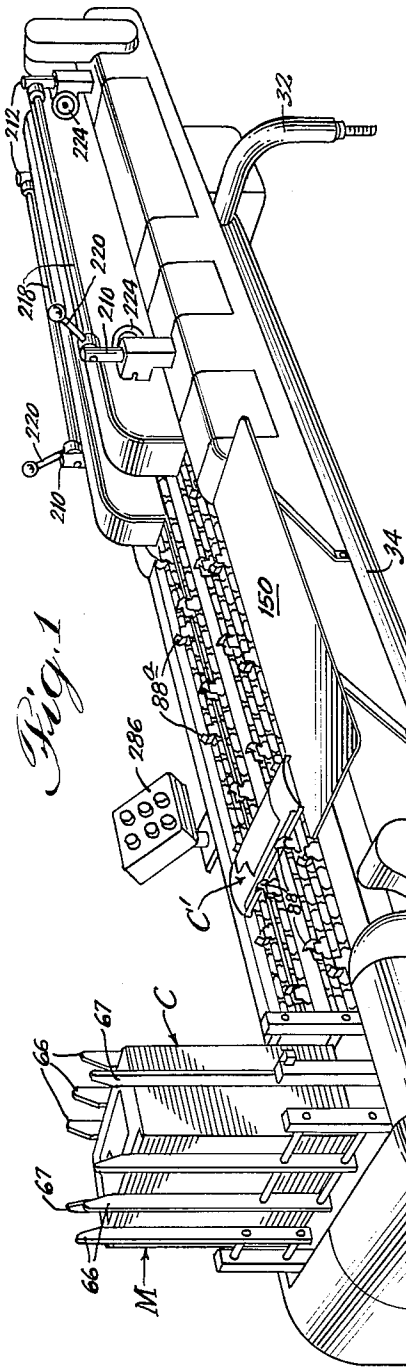
Sept. 12, 1961

R. D. CLANIN ET AL
CARTONING MACHINE

2,999,344

Filed Aug. 3, 1959

13 Sheets-Sheet 1



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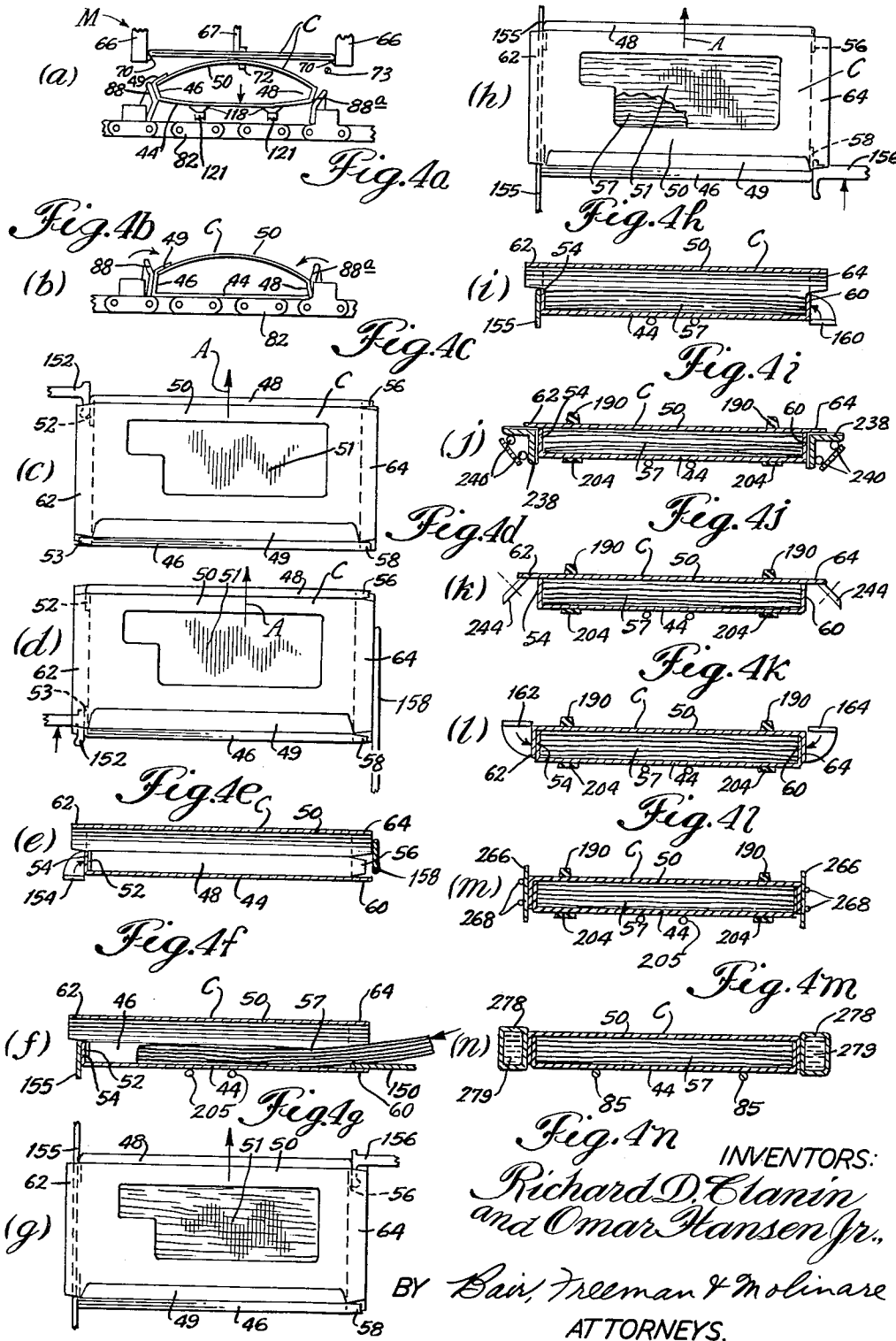
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CARTONING MACHINE

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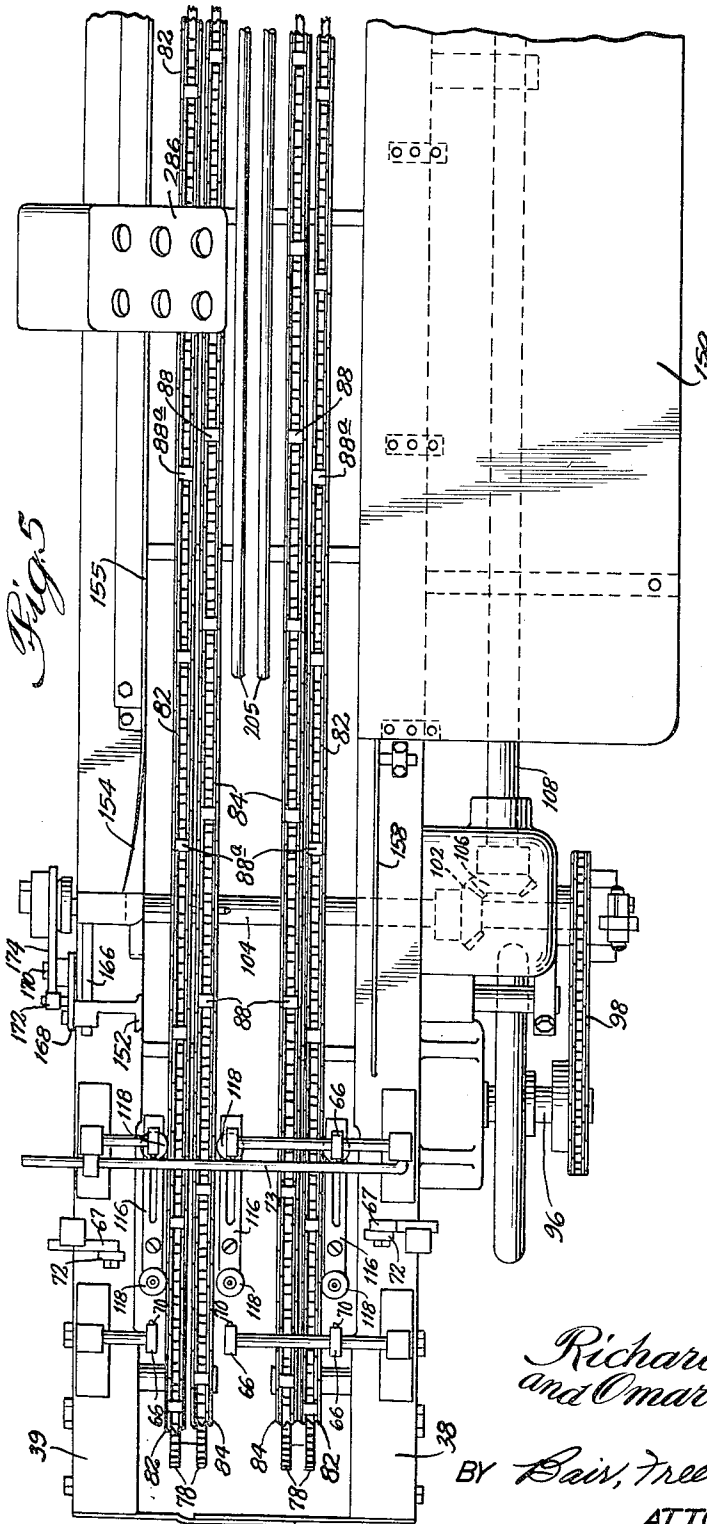


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CARTONING MACHINE

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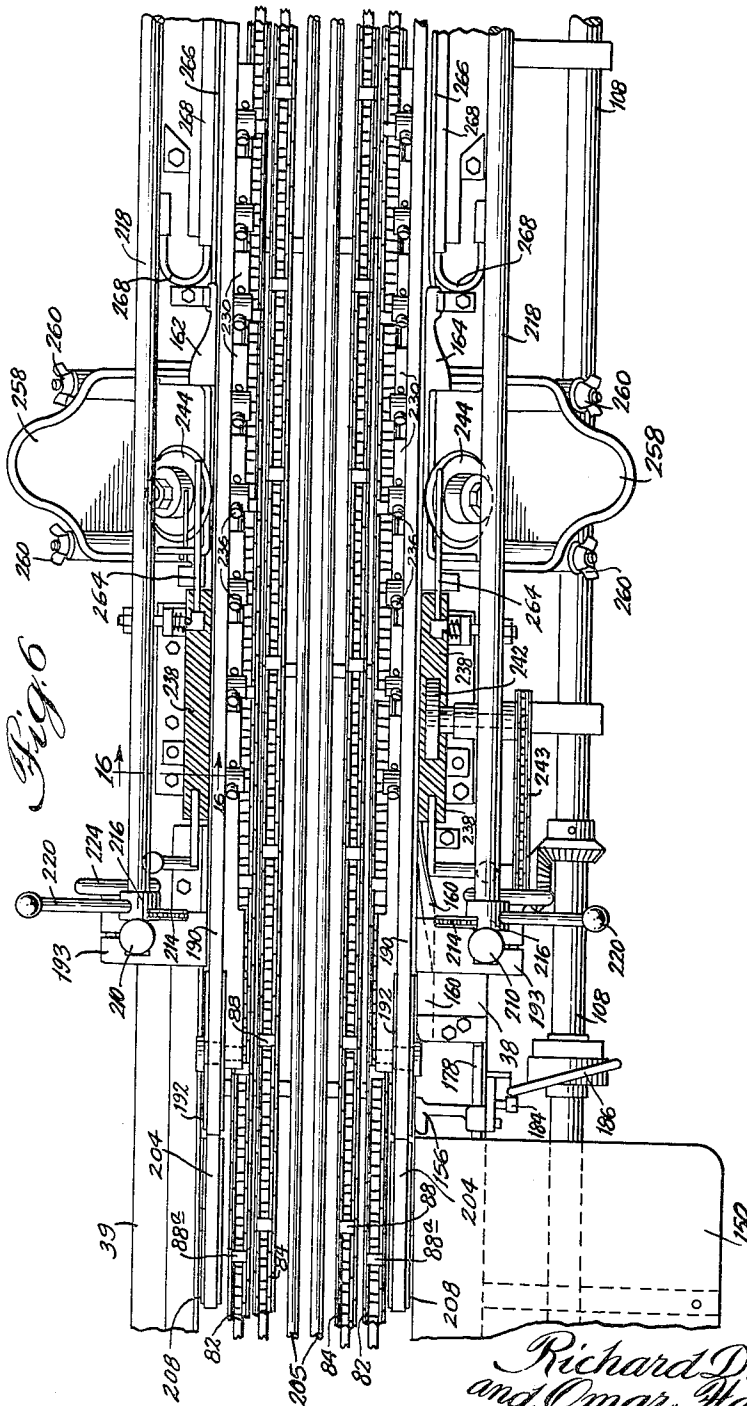
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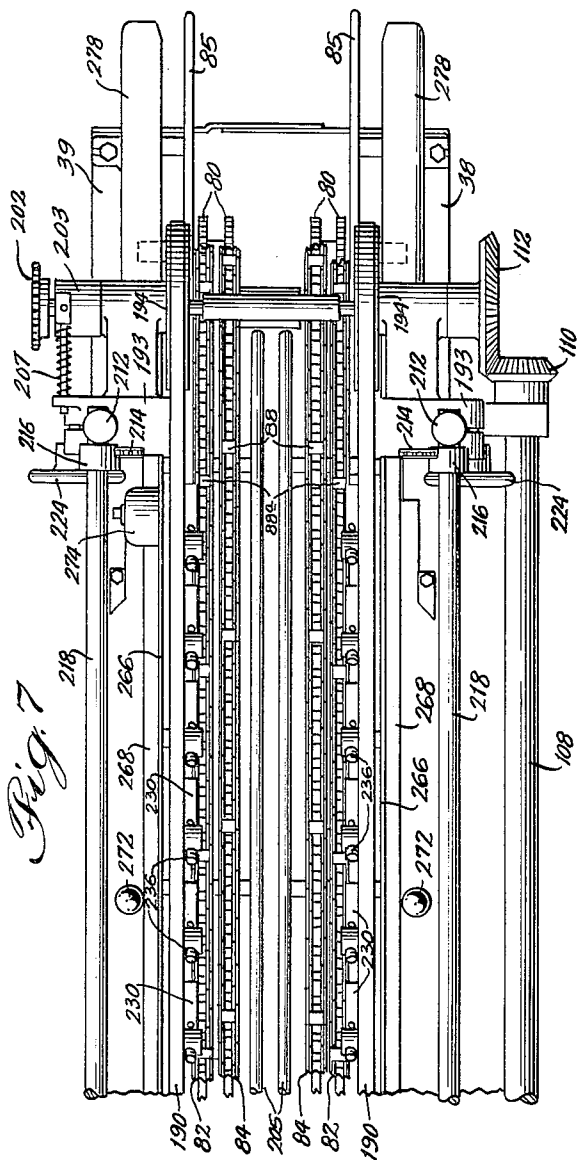
R. D. CLANIN ET AL

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CARTONING MACHINE

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13 Sheets-Sheet 5



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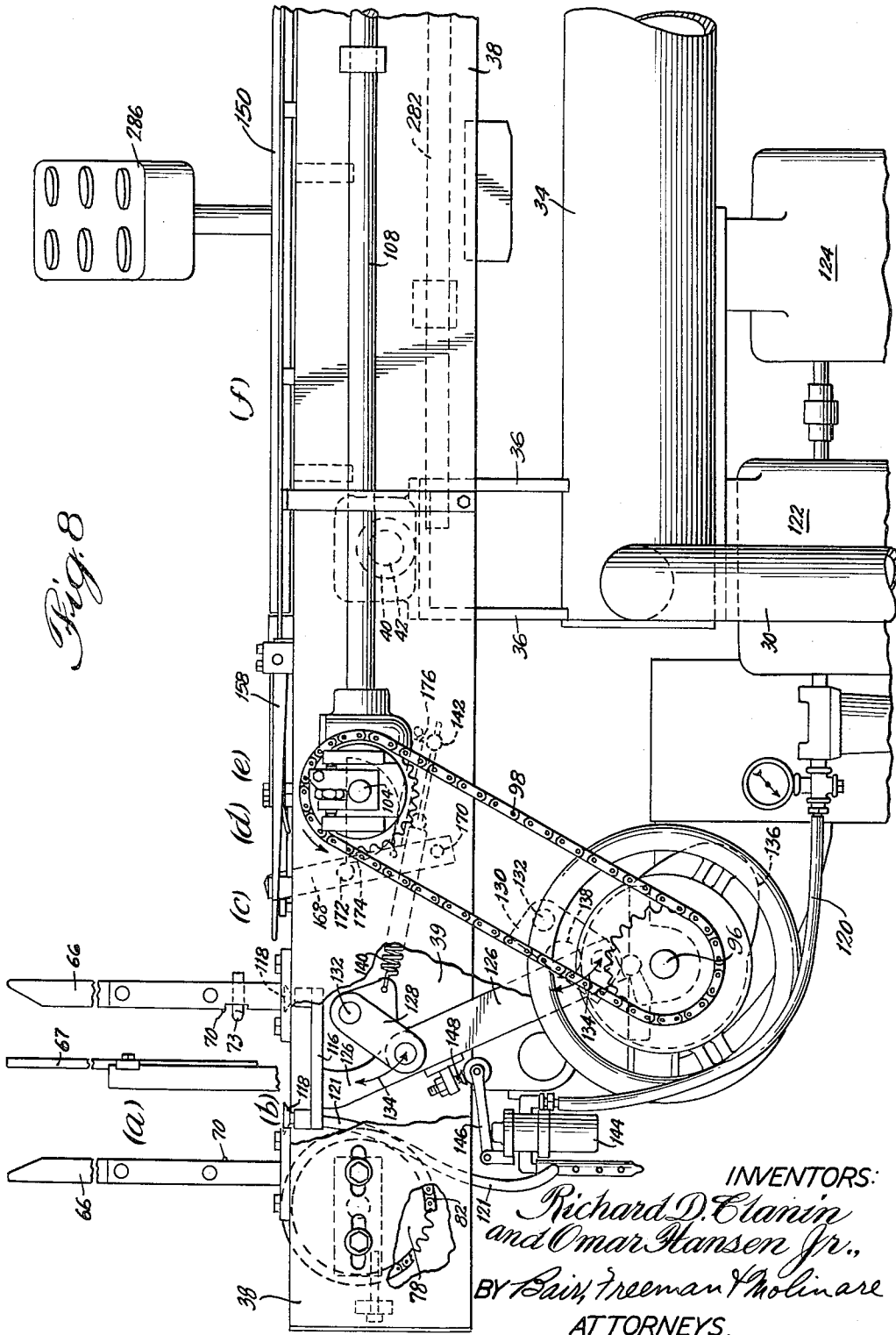
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CARTONING MACHINE

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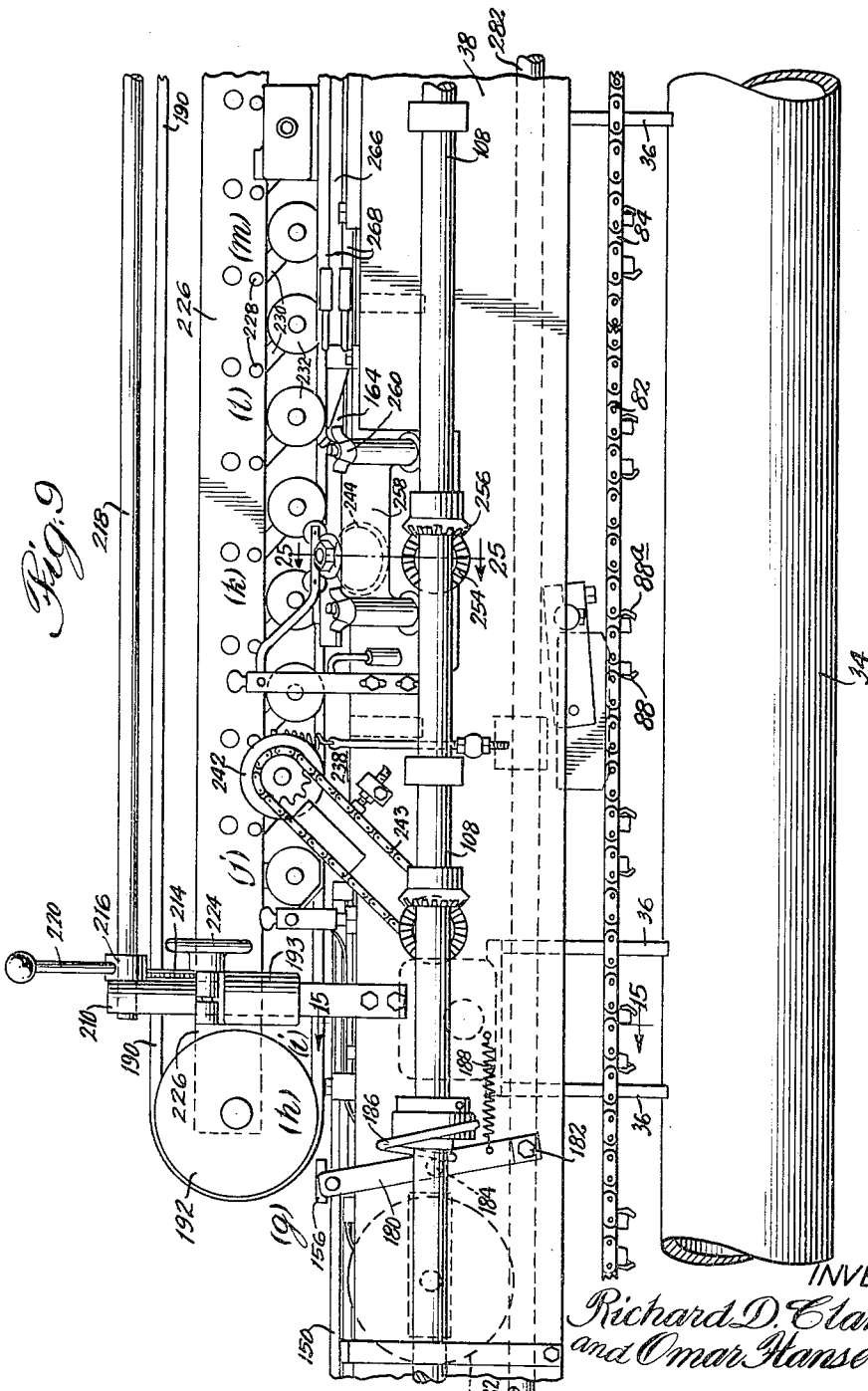
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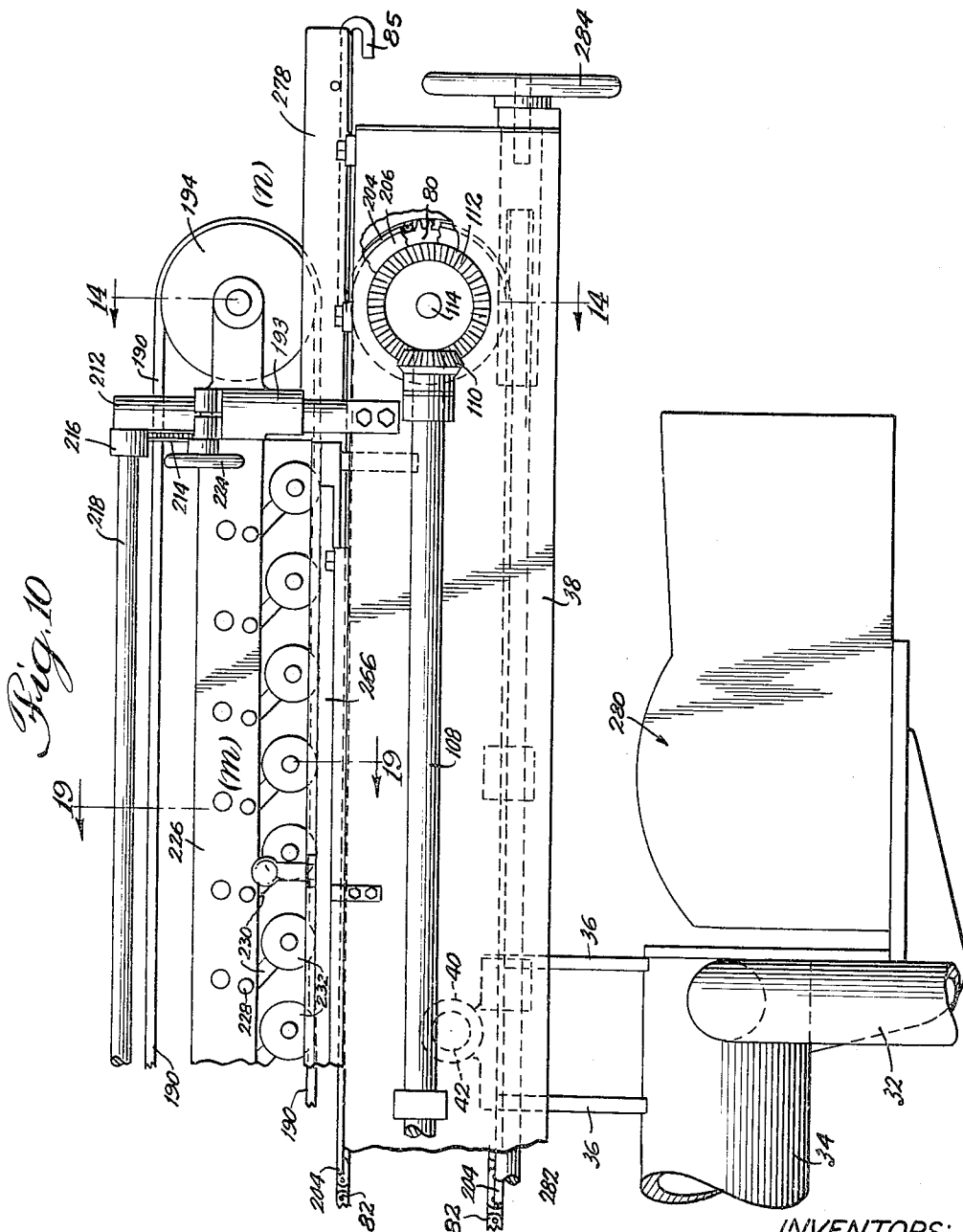
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13 Sheets-Sheet 8



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Fig. 11

Fig. 12

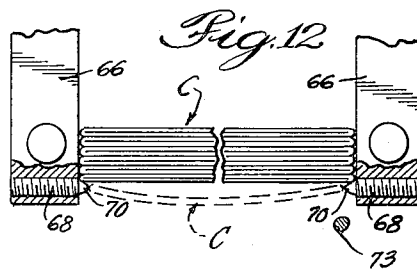
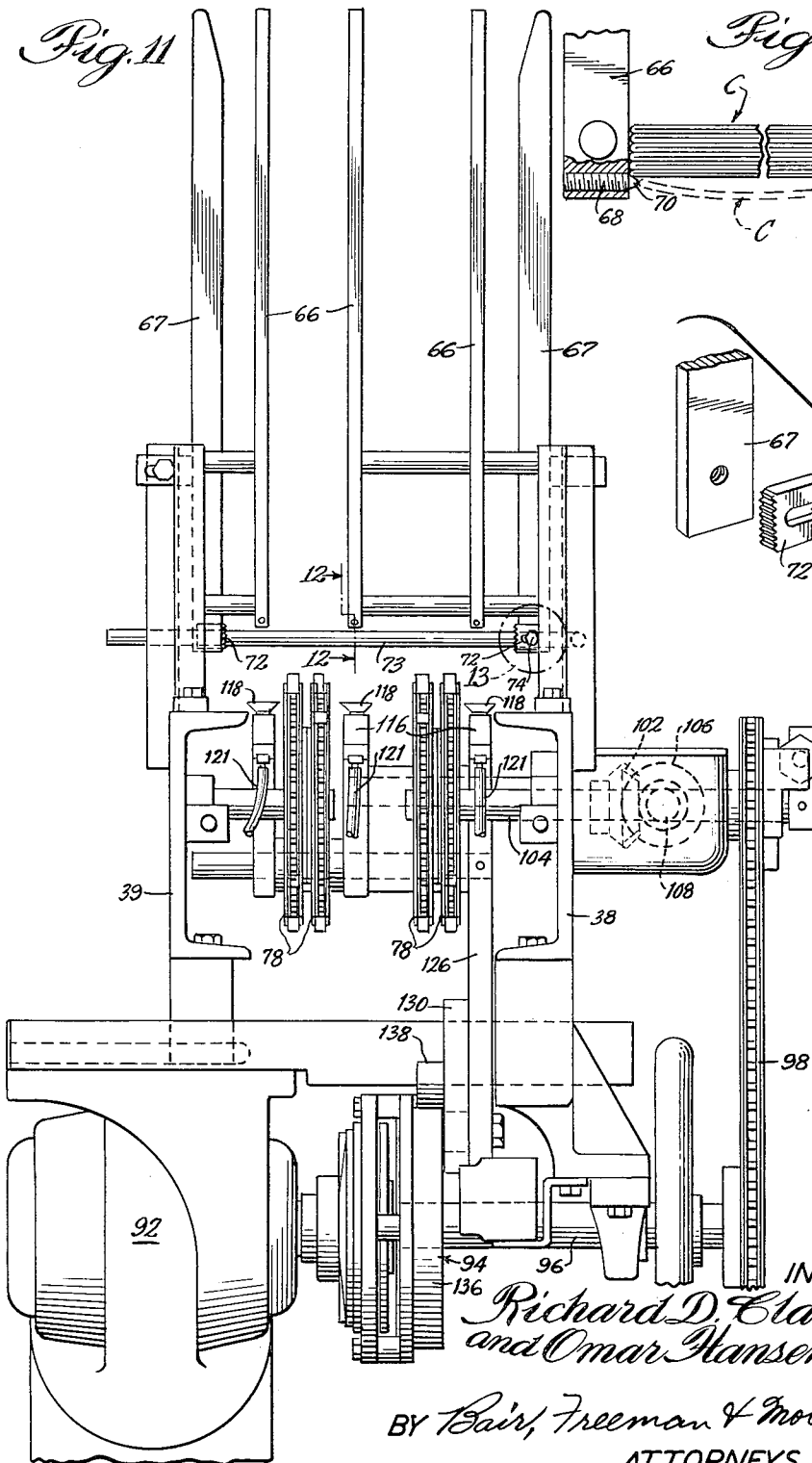
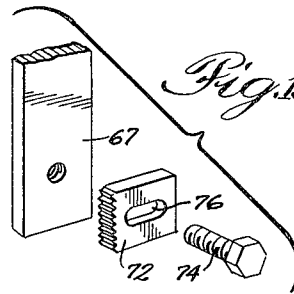


Fig. 13



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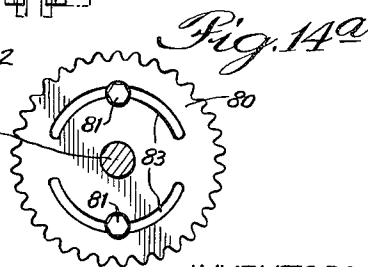
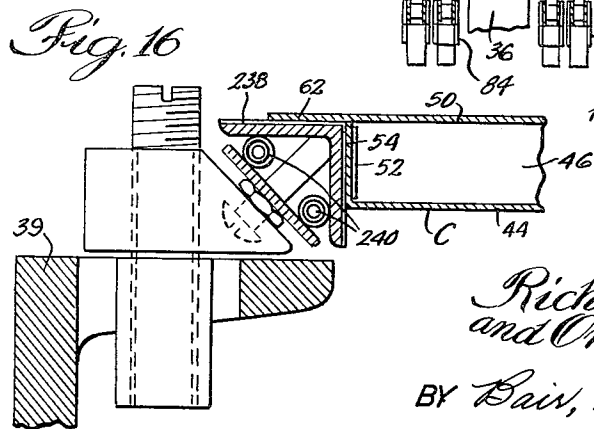
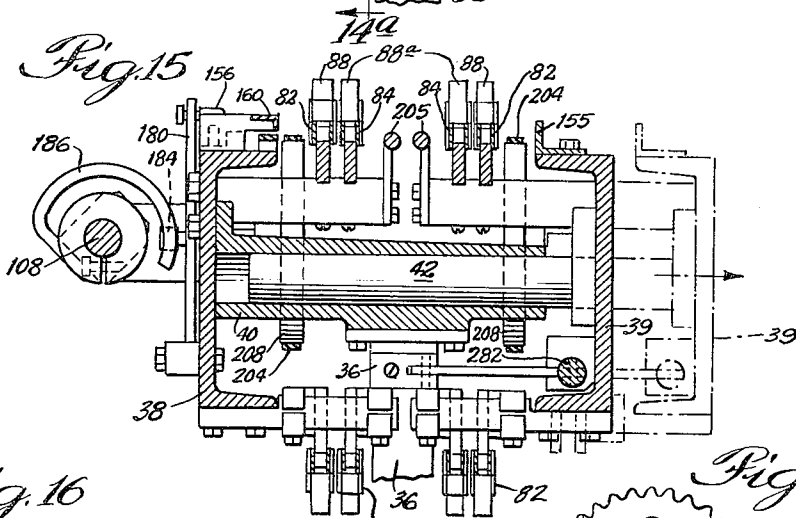
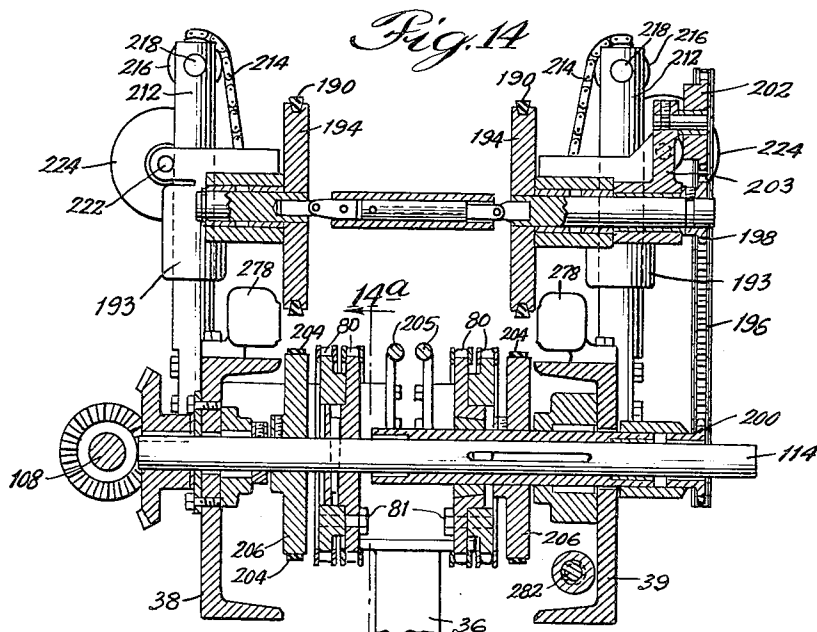
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CARTONING MACHINE

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13 Sheets-Sheet 10



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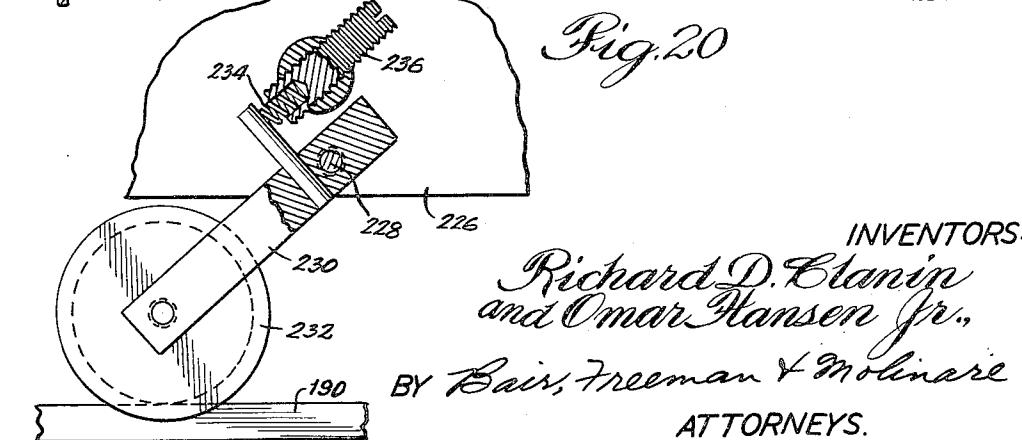
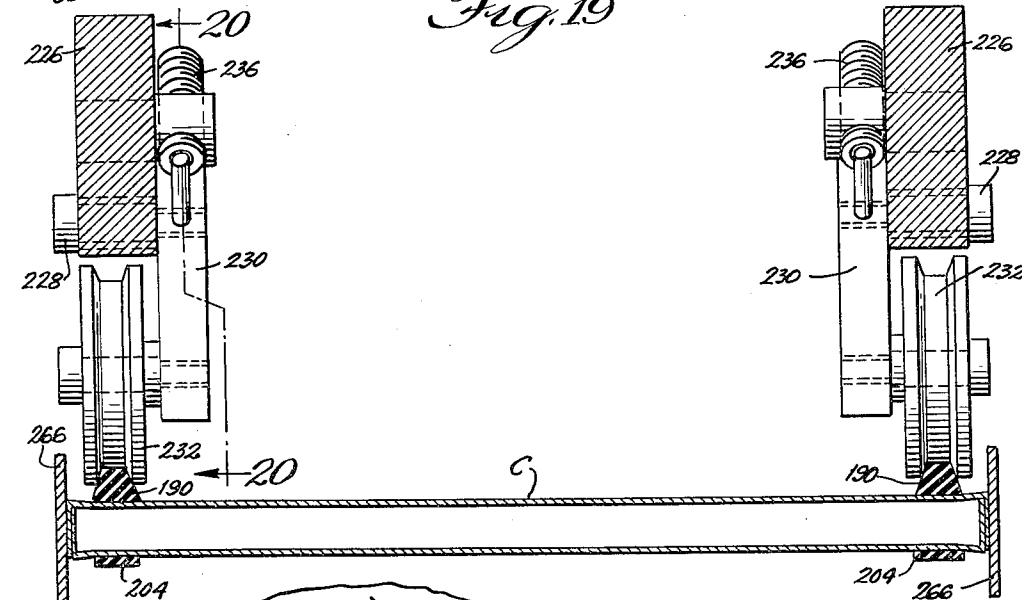
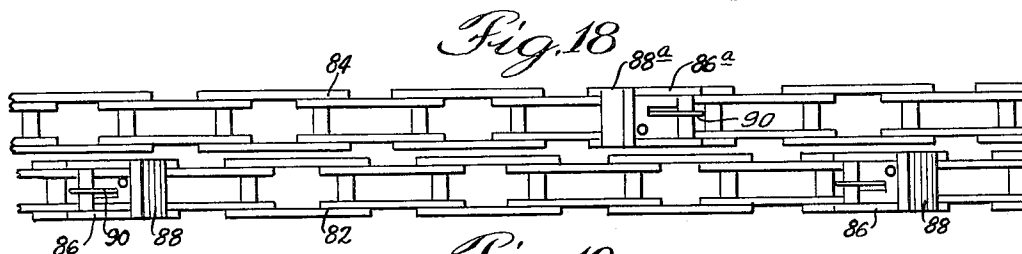
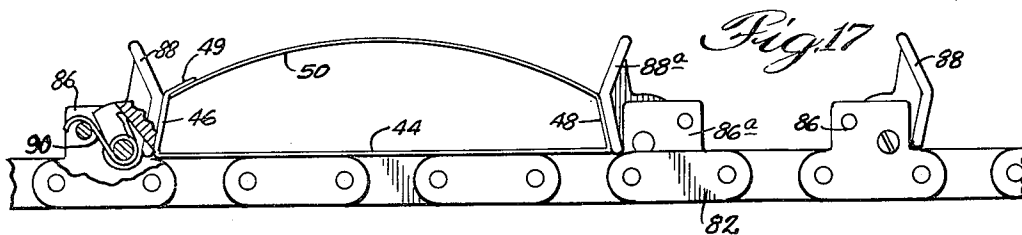
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13 Sheets-Sheet 11



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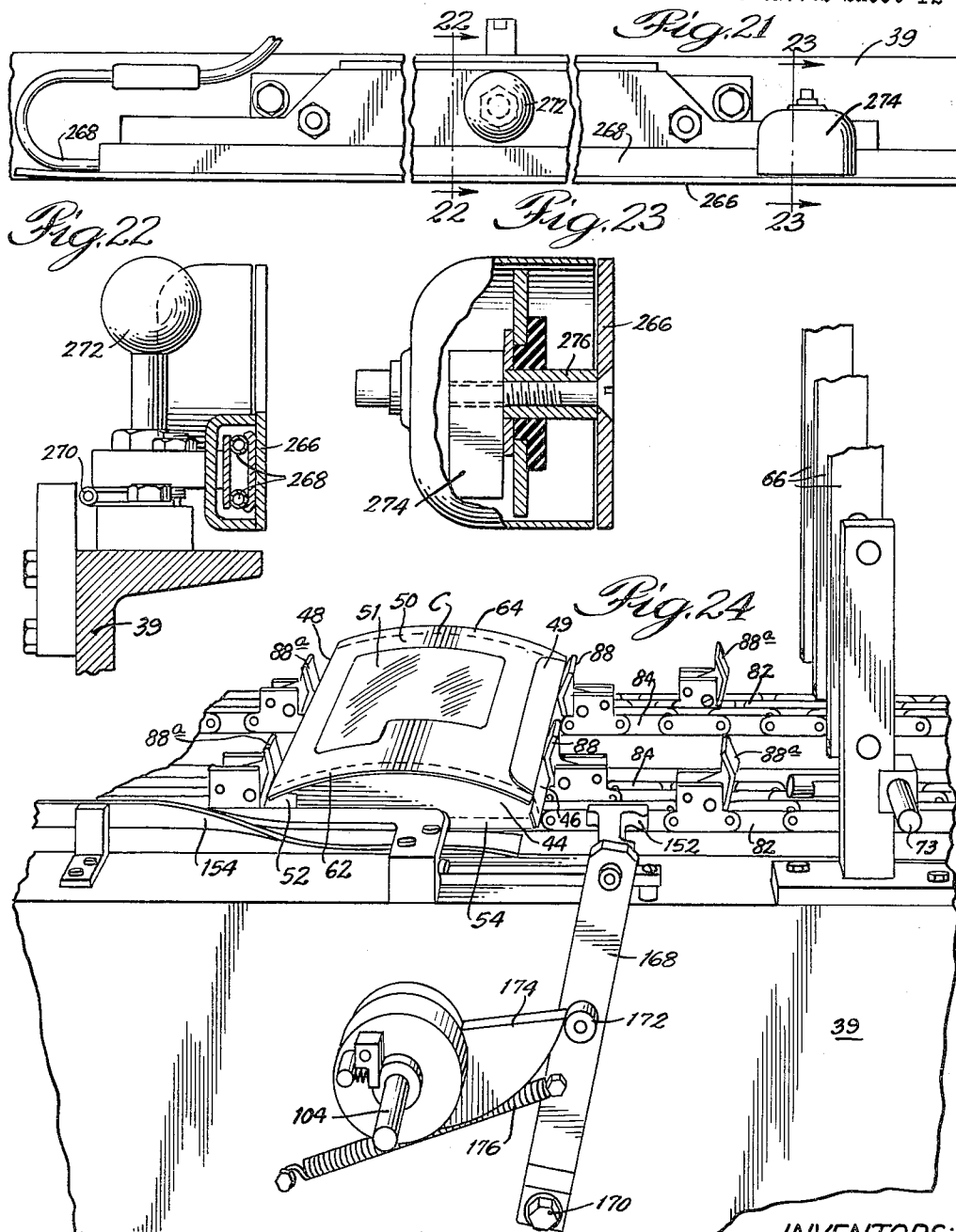
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13 Sheets-Sheet 12



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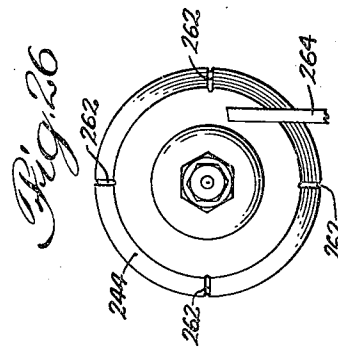
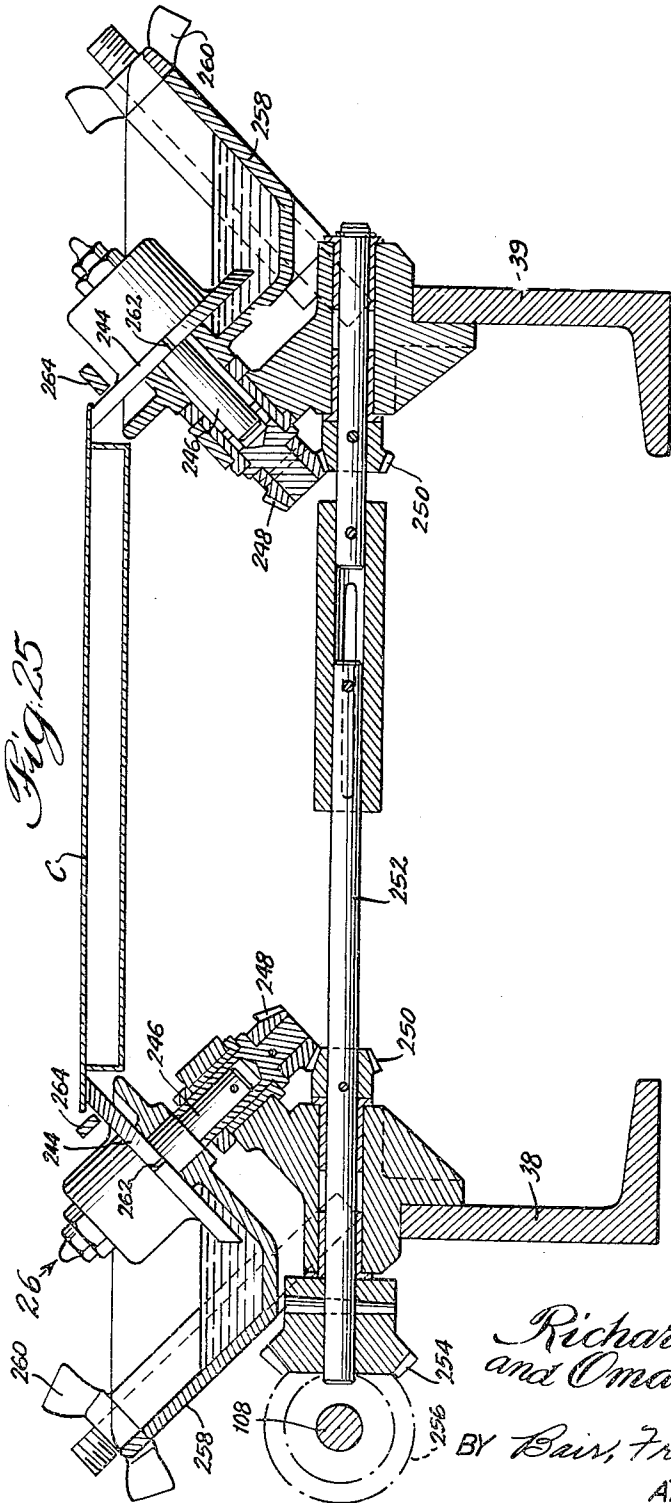
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CARTONING MACHINE

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13 Sheets-Sheet 13



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2,999,344

CARTONING MACHINE

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21 Claims. (Cl. 53-186)

This invention relates to a cartoning machine and particularly one which is adapted to hold a carton in such position that product, such as a pound of sliced bacon, can be inserted therein, whereupon the machine closes the carton and seals it.

One object of the invention is to provide a cartoning machine in which a stack of collapsed cartons are erected and fed to a conveyor by vacuum cup pickup means engaging the bottommost carton of the stack and transferring it to a conveyor, the conveyor having means designed to both receive the carton in erected position and hold it in a bowed-open position to facilitate the entry of the product into the carton.

Another object is to provide the conveyor with dogs biased to engage side panels of the carton in such manner as to bow the top panel of the carton upwardly, thus opening the carton to such position that there is sufficient space for ready insertion of the product.

Still another object is to provide tuckers for partially closing one end of the carton before it comes to a loading station, and means to back up the partially closed end of the carton which serves as a stop for the product as it is inserted manually into the carton, with assurance that the partially closed end of the carton will not be disturbed.

A further object is to provide means for thereafter de-waxing and applying glue to certain portions of the carton, and then completely close the carton around the product.

Still a further object is to provide means to thereafter heat the glued portions of the carton for aiding in the setting of the glue on the carton to completely seal the product therein.

An additional object is to provide chill blocks between which the carton thereafter passes for chilling the glued and heated ends of the carton so as to condition the carton for immediate delivery from the machine, whereby the entire operation of loading and sealing the carton may be accomplished in a minimum of time and the machine thereby has great capacity in a relatively small space.

With these and other objects in view, our invention consists in the construction, arrangement and combination of the various parts of our cartoning machine, whereby the objects above contemplated are attained, as hereinafter more fully set forth, pointed out in our claims and illustrated in detail on the accompanying drawings, wherein:

FIG. 1 is a perspective view of a cartoning machine embodying our invention;

FIG. 2 is a perspective view of a carton used therein and shows the carton opened from a collapsed position;

FIG. 3 is a layout of the carton blank;

FIGS. 4a through 4n, inclusive, are diagrammatic views showing the successive operations performed by our cartoning machine;

FIG. 5 is an enlarged plan view of the cartoning machine showing the front or infeed end, about one-third of the machine being shown;

FIG. 6 is a continuation of the right-hand end of FIG. 5;

FIG. 7 is a continuation of FIG. 6 and shows the rear or discharge end of the machine;

FIGS. 8, 9 and 10 are a side elevation in three sections

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corresponding respectively to the plan view shown in FIGS. 5, 6 and 7;

FIG. 11 is a front end elevation of portions of the machine with certain safety guards removed to show the operating mechanism;

FIG. 12 is an enlarged detail sectional view on the line 12-12 of FIG. 11;

FIG. 13 is a fragmentary perspective view of that portion of the machine shown in FIG. 11 within the dot-and-dash circle 13 thereof;

FIG. 14 is a vertical sectional view on the line 14-14 of FIG. 10;

FIG. 14a is a detail on the line 14a-14a of FIG. 14; FIG. 15 is a vertical sectional view on the line 15-15 of FIG. 9;

FIG. 16 is an enlarged vertical sectional view on the line 16-16 of FIG. 6 showing a mechanism for scraping off excess wax from certain flaps of the carton;

FIG. 17 is an enlarged side elevation of a conveyor chain with dogs thereon holding a carton in bowed-open position;

FIG. 18 is a plan view of the chain shown in FIG. 17;

FIG. 19 is an enlarged vertical sectional view on the line 19-19 of FIG. 10 showing a pair of hold-down rollers and individual adjusting means therefor;

FIG. 20 is a vertical sectional view on the line 20-20 of FIG. 19;

FIG. 21 is an enlarged plan view of a heater plate assembly shown in the side elevation of FIGS. 9 and 10 and thermostat therefor;

FIG. 22 is a vertical sectional view of the heater plate assembly shown in FIG. 21, and is taken on the line 22-22 thereof;

FIG. 23 is an enlarged vertical sectional view through the thermostat shown in FIG. 21 and is taken on the line 23-23 thereof;

FIG. 24 is a perspective view of a portion of the machine where the carton is held in bowed-open position by the dogs of the conveyor chain to facilitate loading the product therein;

FIG. 25 is an enlarged vertical sectional view on the line 25-25 of FIG. 9 to show a panel gluing mechanism; and

FIG. 26 is a plan view of one of the gluing rollers and viewed in the direction of the arrow 26 adjacent FIG. 25.

On the accompanying drawings we have used the reference numerals 30 and 32 to indicate front and rear supporting legs for our cartoning machine which legs are rigidly connected together by a frame tube 34 welded to the legs. Three pair of uprights 36 (FIGS. 8, 9 and 10) are welded to the top of the frame tube 34 and to a right side longitudinal frame channel 38 so that the elements 30, 32, 34, 36 and 38 form a frame work for our cartoning machine. Each pair of uprights 36 has secured thereto at the upper ends thereof a tube 40, shown in section in FIG. 15, that supports the right side frame channel 38 (shown at the left-hand side in FIG. 15 because the section is taken looking toward the infeed end of the machine). A rod 42 telescopes into the tube 40 and supports a right side frame channel 39 so that the distance between the channels 38 and 39 may be adjusted to accommodate different lengths of cartons, as will hereinafter appear.

At the front or infeed end of the machine (left-hand end in FIG. 1) is a magazine M for collapsed cartons C. One of the cartons is shown in FIG. 2 in erected position. The blank for the carton is shown in FIG. 3, consisting of a bottom panel 44, a front side panel 46, a rear side panel 48, a top panel 50 having a transparent window 51, and flap 49. The cartons C are placed in

the magazine M in collapsed condition with the flap 49 glued to one marginal edge of the top panel 50 as shown in FIG. 2, wherein the carton has been slightly expanded to form a rectangular tube of the elements 44, 46, 48 and 50. The blank for the carton further includes dust tabs 52, 53, 56 and 58, bottom end panels 54 and 60, and top end panels 62 and 64.

The magazine M comprises six uprights 66 and two uprights 67 to hold the cartons C in a vertical stack, as illustrated in FIG. 1, and permit feeding of the cartons one at a time from the bottom of the stack. The uprights 66 are suitably supported rigidly on the frame of the cartoning machine, and at their lower ends they are provided with stop screws 68 as shown in FIG. 12, having rounded projections 70 supporting the edges of the cartons C as illustrated. It will be obvious, however, that if the bottommost carton is bowed downwardly, as shown dotted, it may be withdrawn from supported position on the projections 70, as will hereinafter appear.

The two bars 67 are provided at their lower ends with strippers 72 to engage the edges of the top end panels 62 and 64, the bottom end panels 54 and 60 being notched at 55 and 61, respectively, to clear these strippers for a purpose which will hereinafter appear. As shown in FIG. 13, the strippers may be adjusted by means of a clamp screw 74 through a slot 76 of each stripper.

At the front or infeed end of the machine (FIGS. 5 and 8) we provide four conveyor chain sprockets 78, and at the rear or discharge end of the machine we provide a similar plurality of conveyor chain sprockets 80 (FIGS. 7 and 10). Around the sprockets 78 and 80 are two sets of conveyor chains, outer chains 82 and inner chains 84. As shown in FIG. 18, the outer chains are provided with lugs 86 while the inner chains are provided with lugs 86a for supporting pivoted dogs 88 and 88a, respectively. The dogs 88 and 88a are biased by springs 90 to the positions shown in FIG. 17 with the lower ends of the dogs stopped against the upper surfaces of the links 86 and 86a. The dogs 88 and 88a may be sprung apart from each other a few degrees to permit entrance of the carton C as will be made apparent later on in the description of our cartoning machine.

For driving the conveyor chains 82 and 84 we provide a motor 92 (see FIG. 11) provided with a suitable clutch 94 connecting the motor operatively to a drive shaft 96. A drive chain 98 connects the shaft 96 to a shaft 104, the chain 98 being normally housed in a safety guard 100 as shown in FIG. 1, and this safety guard being removed in the remaining figures. As shown in FIG. 5, a bevel gear 102 is mounted on the shaft 104 and a bevel gear 106 meshes therewith, the latter gear being on a longitudinal shaft 108 shown in FIGS. 5 to 10 inclusive. FIGS. 7 and 10 also show a bevel pinion 110 on the longitudinal shaft 108 with which a bevel gear 112 meshes, the bevel gear 112 being mounted on a conveyor shaft 114 on which the conveyor chain sprockets 80 are mounted.

Three vacuum cup supporting bars 116 (see FIGS. 5 and 8 near left end) are provided, each equipped with a pair of vacuum cups 118 to engage the lowermost carton C and extract the same from the magazine M, the vacuum cups being connected by a hose 120 to a vacuum pump 122 driven by an electric motor 124. The bars 116 are mounted on a supporting arm 126 (see FIG. 11) pivoted to upper and lower parallelogram links 128 and 130 (see FIG. 8), which in turn are pivoted at 132 to the frame of the machine. The links 128 and 130 are oscillated through arcs, indicated at 134 in FIG. 8 by a cam 136 (about $\frac{3}{4}$ dwell and $\frac{1}{4}$ rise and fall) engaging a roller 138 on the link 130, the roller being held in engagement with the cam by a spring 140 connected to the link 128 and anchored at 142.

Interposed in the vacuum hose 120 is a vacuum valve 144 which is biased to open position, a pivoted lever 146 being provided to close it by depression of the lever as to the position shown in FIG. 8 by an adjustable pro-

jection 148 on the supporting arm 126. The vacuum valve 144 is open during the major portion of the oscillation of the links 128 and 130 from their lowermost dwell position.

Proceeding toward the discharge end of the machine, a product shelf 150 is illustrated for the convenience of the operator in supporting product that is inserted by hand into the cartons, one of which is shown at C' in FIG. 1. As shown in FIG. 4, our cartoning machine includes a dust tab tucker 152 (FIG. 5) for the dust tabs 52 and 53, a dust tab tucker 156 (FIG. 6) for the dust tabs 56 and 58, bottom end panel tuckers 154 and 160 for the bottom end panels 54 and 60 respectively, and top end panel tuckers 162 and 164 for the top end panels 62 and 64 respectively. The dust tab tucker 152 is shown in FIG. 5. The tucker 152 is movable, being slidable on a guide rod 166, and slid thereon by a lever 168 (see FIGS. 8 and 24) pivoted at 170 and carrying a roller 172 with which a cam 174 coacts. A spring 176 is provided to keep the roller in contact with the cam 174. The cam is secured to the shaft 104.

The bottom end panel tucker 154 is a "plow" or twisted blade beginning in the horizontal position shown in FIG. 4(e) and twisting upwardly to a vertical position (also see FIG. 5).

FIGS. 8, 9 and 10 also include thereadjacent the designations (a) to (n) at the various positions along the machine where the operations depicted in FIG. 4 occur. Opposing the tuckers 152 and 154 is a stop rail 158 also shown in FIG. 5, and in FIG. 4(d), (e) and (f). A stop plate 155 shown in FIG. 4(f) to (i) forms a continuation of the bottom end panel tucker 154.

The dust tab tucker 156 (see FIGS. 4(h), 6 and 9) is slidable on a stationary rod 178 and is slid therealong by a lever 180 pivoted at 182 and having a roller 184 journaled thereon. The roller 184 is adapted to engage with a cam 186 by a spring 188, the cam being in the form of a spiral rod as also shown in FIG. 15.

The bottom end panel tucker 160 is also in the form of a plow starting in the horizontal position shown in FIG. 4(i) and twisting upwardly to the vertical position (see also FIG. 6).

Hold-down belts 190 (see FIGS. 4(j) to (n) and FIG. 14) are provided for engaging the tops of the cartons until they are sealed, the cartons riding supporting belts 204. The belts 190 extend around pulleys 192 and 194, the pulleys 194 being driven as illustrated in FIG. 14 by an assembly of three sprockets 198, 200 and 202, and a chain 196 therearound, the arrangement being such as to permit vertical adjustment of the pulleys 192 (FIGS. 6 and 9) and 194, and thereby the spacing between the hold-down belts 190 and the supporting belts 204 may be adjusted. The belts 204 pass around supporting belt wheels 206 (FIGS. 10 and 14) and 208 (FIGS. 6 and 9). The sprocket 200 is mounted on the shaft 114 and the sprocket 202 is mounted on an arm 203 rotatable about the axis of the sprockets 194 and 198, and is urged by a spring 207 (FIG. 7) in the proper direction to automatically take up slack in the chain 196.

Supporting rods 205 for the central portion of the carton also extend throughout the major portion of the machine as shown in FIGS. 4(f) to (m), 5, 6 and 7.

The vertical adjustment of the hold-down belts 190 is effected by mounting the pulleys 192 and 194, and castings 193 and hold-down roller supporting bars 226 that carry them for vertical sliding on posts 210 shown in FIGS. 6 and 9, and posts 212 shown in FIGS. 7, 10 and 14. The castings 193 and the bars 226 are supported by chains 214 secured to rollers 216 mounted on rock shafts 218. Rock shaft levers 220 (FIGS. 6 and 9) are provided to rock the shafts 218 and thereby raise or lower the pulleys 192 and 194 as desired while clamp screws 222 are loose. After the desired adjustment the screws can be tightened by rotating knobs 224 of the screws.

The hold-down roller supporting bars 226 have pivoted

thereto at 228, arms 230 on which hold-down rollers 232 are journaled. These rollers, as shown in FIGS. 19 and 20, engage the lower stretches of the hold-down belts 190. The arms and thereby the rollers are spring biased downwardly by means of springs 234, and the hold-down effect of each roller may be individually adjusted by means of adjusting screws 236.

Angle shaped de-waxer plates 238 shown in FIGS. 4(j), 6, 9 and 16 are heated by electric heaters 240. The upper surfaces of the plates 238 are scarfed as shown by the diagonal lining in FIG. 6. A dater roller 242 overlies the right side de-waxer plate and is driven by a chain 243.

Referring to FIGS. 4(k), 25 and 26, glue applying rolls 244 are provided for the top end panels 62 and 64 of the carton C. These rolls are mounted on shafts 246 operatively but disconnectibly connected with bevel pinions 248 meshing with bevel pinions 250 on a shaft 252. The shaft 252 has a bevel gear 254 thereon meshing with a bevel gear 256 on the shaft 108 so as to be driven from this latter shaft.

Removable glue pots 258 are provided into which the glue applying rolls 244 dip, as illustrated in FIG. 25, and these are held in position by wing nuts 260. We find it advantageous to notch the carton end panel engaging surfaces of the glue applying rolls 244, as indicated at 262, and the usual doctor blades 264 are provided for operation in conjunction with the glue applying roll. The entire glue pot 258 with the glue roll 244 is removable for cleaning after removal of the wing nuts 260.

The top end panel tuckers 162 and 164 shown in FIGS. 4(l), 6 and 9 are also of the plow or twisted blade type, starting from horizontal positions shown in FIGS. 4(l) and twisting downwardly to vertical positions.

Heater plates 266 heated by electric heating elements 268 are provided as shown in FIGS. 4(m), 6, 7, 9, 10, 21, 22 and 23, which are hingedly mounted as shown at 270 in FIG. 22, so that they can be swung by handles 272 out of operating position under certain circumstances. A thermostatic switch 274 is provided for regulating the electric current to the heating elements 268, and the thermostat is controlled by conduction of heat through a copper tube 276 as shown in FIG. 23 from one of the heater plates 266.

We also provide chill blocks 278 shown in FIGS. 4(n), 7, 10 and 14, supplied with refrigerant from a refrigerating unit shown generally at 280 in FIG. 10.

Our machine, being constructed so that the frame member 38 is stationary relative to the frame tube 34 and the frame member 39 is adjustable relative thereto as illustrated in FIGS. 14 and 15, permits adjustment to different lengths of cartons C, the length thereof being indicated L in FIG. 2 and the width thereof W. For this purpose it will be noted that various operative connections between the shafts in FIGS. 14 and 25 are composed of sections that are telescopically but non-rotatably connected with each other. An adjusting shaft 282 is provided for this purpose equipped with an adjusting hand wheel 284 shown in FIG. 10 but we do not claim the adjusting mechanism. As already described, the hold-down belts 190 can be vertically adjusted for the thickness of the carton being used in our machine, and certain other parts are likewise adjustable in conjunction therewith, but we do not deem it necessary to describe these in detail.

Referring to FIG. 18, it will be obvious that if the chain 84 is adjusted toward the right relative to the chain 82, the distance between the dogs 88 and 88a will be increased so as to take a wider carton C. This adjustment is accomplished by loosening the four bolts 81, shown in FIG. 14a, of the two inner sprockets 80 shown in FIG. 14, adjusting these sprockets relative to the outer sprockets 80 (the arcuate slots 83 of FIG. 14a permitting such adjustment) and re-tightening the bolts 81.

Practical operation

After our machine has been adjusted to a desired size of carton, the magazine M is loaded with such cartons, and after a proper standby period for the heating elements 240 and 268 to attain their proper high operating temperature and similarly the chill blocks 278 to attain their proper low operating temperature, the machine may be started and will operate as follows, referring particularly to FIG. 4.

The vacuum cups 118 move upwardly from their lowermost position shown in FIG. 8 until they contact the lowermost carton C resting on the projections 70, and since vacuum is applied to the cups soon after they leave their lowermost position, the cups grip the lower surface of the carton for the purpose of pulling it downwardly when the cups again move downwardly. In moving downwardly as to the position shown in FIG. 4(a), the bottom panel 44 of this carton moves with the cups (first engaging a breaker rod 73 that facilitates the erecting operation) unhampered by the strippers 72 because of the notches 55 and 61 in the bottom end panels 54 and 60 respectively. The top end panels 62 and 64, however, engage the strippers 72 so that the strippers bow the top panel 50 upwardly as illustrated, thus erecting the front side panel 46 and the rear side panel 48 so that the carton can be guided into position between the dogs 88 and 88a.

In the final lowered position of the carton as shown in FIG. 4(b), the carton is held in the bowed-open position by the springs 90 acting on the dogs 88 and 88a, and in this position the carton may readily receive the product such as strips of bacon 57 shown in FIG. 4(f) placed manually therein from a position on the product shelf 150. However, before the insertion it is desirable to tuck the dust tabs 52 and 53, and the bottom end panel 54, as shown in FIG. 4(c), (d) and (e) respectively. Movement of the chains 80 to the right in FIG. 4(b) moves the carton C in the upward direction (arrow A) in FIG. 4(c) so that the tucker 152 will first tuck the flap 52 because of the movement of the carton relative to the tucker, and then as in FIG. 4(d) the tucker 152 will move toward the rear of the machine (upwardly in this figure) faster than the speed of the carton to tuck the dust tab 53. Then as the carton moves still farther, the tucker 154 will tuck the panel 54 to the vertical position shown in FIG. 4(e) to serve as a stop for the product 57 when inserted as in FIG. 4(f). At this time the carton C is opposite the stop plate 155 and the panel 54 thus supported adequately to take the shock of the incoming product 57.

The next step in the operation is the movement of the carton forwardly (upwardly in FIG. 4(g)) past the tucker 156 which tucks the dust tab 56, and then as in FIG. 4(h) the tucker 156 moves upwardly at a greater speed than the movement of the carton to tuck the dust tab 58. Next, in FIG. 4(i) the tucker 160 plows the panel 60 upwardly to the vertical position. It will be noted that the top panel 50 is still in the bowed-up position. At this time, however, it starts to come under the hold-down belts 190 and rollers 232 which flatten the top panel 50 to the position shown in FIG. 4(j), the springs 90 behind the dogs 88 and 88a permitting them to spread apart and the panels 46 and 48 to assume vertical positions so that in cross section lengthwise of the machine the carton is of rectangular shape when it reaches the FIG. 4(j) position.

At this position the de-waxer plates 238 remove some of the wax from the panels 54, 60, 62 and 64, and so heat the remaining wax that the panels absorb it to permit the glue applied in FIG. 4(k) from the glue-applying rollers 244 to hold firmly after it sets.

The tuckers 162 and 164 then tuck the flaps 62 and 64 as shown in FIG. 4(l) as the carton of product progresses through the machine, after which the carton reaches the heater plates 266 as shown in FIG. 4(m).

that hold the panels firmly in position while the heat sets the glue. The combination of pressure produced by the heating plates 266 and the hold-down rollers and belts determines the sealing efficiency of the machine and may be adjusted as desired.

Finally, in order to remove excessive heat and help complete the setting of the glue, the carton passes between the chill blocks 278 as shown in FIG. 4(m) which are supplied with refrigerant liquid 279 from the refrigerating unit 280. During the last portion of travel through the machine, the completed packages leave the conveyor chains 82 and 84 and are pushed along supporting rods 85 shown in FIGS. 7 and 10 from which they may be discharged onto a take-away conveyor (not shown), placed in a carton for shipping or otherwise disposed of.

The first of the hold-down rollers 232 acting between positions FIGS. 4(i) and (j) help to flatten any bulky product to the carton thickness, and the carton is thereafter confined between the hold-down rollers and the chains 82 and 84 as in FIG. 4(j) and (m) to prevent undesirable buckling of the top and bottom panels 50 and 44 when heat is applied as in FIGS. 4(j) and (m). After the carton has been advanced to the de-waxing plates (FIG. 4(j)), the carton is held firmly but not pinched.

The heaters 266 (FIG. 4(m)) should be adjusted so that the carton is held firmly between them to insure best heat transfer as well as pressure, and the chill blocks 278 are adjusted with only enough pressure so that the carton just rubs the blocks while passing through. The chill block temperature should be 35° to 40° F. when cartons pass through about 50 per minute. The usual push button control station for operating the machine may be provided as shown at 286 in FIG. 1.

From the foregoing specification it will be obvious that we have provided a cartoning machine which will remove collapsed cartons one at a time from a magazine, open them sufficiently to permit manual insertion of product such as bacon, close the carton and heat seal the final closure thereof, after which the portions that were heat sealed are chilled to permit passage thereof through the machine in 20 to 30 seconds with assurance that as the packages leave the machine they will remain sealed. A suitable variable speed drive may be provided between the motor 92 and the drive shaft 96 so that the speed of the machine may be varied to suit the particular operator who is loading the cartons. On an average, where pounds of bacon are involved, 50 per minute is the approximate rate.

Some changes may be made in the construction and arrangement of the parts of our cartoning machine without departing from the real spirit and purpose of our invention, and it is our intention to cover by our claims any modified forms of structure or use of mechanical equivalents which may reasonably be included within their scope.

What is claimed is:

1. In a cartoning machine of the character disclosed, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, said conveyor having carton-receiving dogs biased to engage the side panels of the carton and bow the top panel of the carton upwardly, said magazine having projections for supporting said stack of cartons in such manner that the lowermost one may be withdrawn downwardly from the stack, vacuum cups for engaging the lowermost carton, withdrawing it from the magazine, partly erecting it and preliminarily bowing the top panel thereof, said magazine having strippers for engaging said top panel to effect such bowing and a

breaker rod to start the erection of the carton as it is withdrawn past said breaker rod, tuckers for dust tabs and an end panel at one end of the carton, means for retaining said dust tabs and said end panel tucked to serve as a stop for product inserted into the carton from the other end thereof, a tucker for dust tabs and an end panel at the other end of the carton, dewaxers past which the carton passes comprising heating plates and heaters therefor to remove part of the wax from the ends of the carton and the top end panels thereof to permit the application of glue thereto, holddown means for removing the bow from the top panel of the carton and contacting the end panels thereof with said dewaxing means, gluing means for said carton ends and said remaining end panels thereof, tucking means for said top end panels to tuck them against the ends of the carton, means to heat said ends to set the glue, means to cool said ends to insure that the glue remains set, and means for discharging the sealed carton from said machine.

2. In a cartoning machine of the character disclosed, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, said conveyor having carton-receiving dogs to engage the side panels of the carton and bow the top panel of the carton upwardly, tuckers for dust tabs and an end panel at one end of the carton, means for retaining said dust tabs and said end panel tucked to serve as a stop for product inserted into the carton from the other end thereof, a tucker for dust tabs and an end panel at the other end of the carton, dewaxers past which the carton passes comprising heating plates and heaters therefor to remove part of the wax from the ends of the carton and the top end panels thereof to permit the application of glue thereto, holddown means for removing the bow from the top panel of the carton and contacting the end panels thereof with said dewaxing means, gluing means for said carton ends and said remaining end panels thereof, tucking means for said top end panels to tuck them against the ends of the carton, means to heat said ends to set the glue, means to cool said ends to insure that the glue remains set, and means for discharging the sealed carton from said machine.

3. In a cartoning machine, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, said conveyor having carton-receiving dogs to engage the side panels of the carton and bow the top panel of the carton upwardly, tuckers for dust tabs and an end panel at one end of the carton, means for retaining said dust tabs and said end panel tucked to serve as a stop for product inserted into the carton from the other end thereof, a tucker for dust tabs and an end panel at the other end of the carton, holddown means for removing the bow from the top panel of the carton, gluing means for said carton ends and said remaining end panels thereof, tucking means for said top end panels to tuck them against the ends of the carton, and means to adhere said remaining end panels to the ends of the carton for retaining the carton closed.

4. In a cartoning machine, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, said conveyor having carton-receiving dogs to engage the side panels of the carton and bow the top panel of the carton upwardly, said magazine having projections for supporting said

stack of cartons in such manner that the lowermost one may be withdrawn downwardly from the stack, vacuum cups for engaging the lowermost carton, removing it from said magazine, partly erecting it and preliminarily bowing the top panel thereof, tuckers for dust tabs and an end panel at one end of the carton, means for retaining said dust tabs and said end panel tucked to serve as a stop for product inserted into the carton from the other end thereof, a tucker for two dust tabs and an end panel at the other end of the carton, dewaxers past which the carton passes to remove wax from the ends of the carton and the top end panels thereof to permit the application of glue thereto, tucking means for said top end panels to tuck them against the ends of the carton, means to heat said ends to set the glue means to cool said ends to insure that the glue remains set, and means for discharging the carton from said machine.

5. In a cartoning machine, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, said conveyor having carton-receiving dogs to engage the side panels of the carton and bow the top panel of the carton upwardly, tuckers for dust tabs and an end panel at one end of the carton, means for retaining said dust tabs and said end panel tucked to serve as a stop for product inserted into the carton from the other end thereof, a tucker for two dust tabs and an end panel at the other end of the carton, tucking means for said top end panels to tuck them against the ends of the carton, means to heat said ends to set the glue, means to cool said ends to insure that the glue remains set, and means for discharging the carton from said machine.

6. A cartoning machine comprising a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, said conveyor having carton-receiving dogs to engage the side panels of the carton and bow the top panel thereof upwardly, said magazine having projections for supporting said stack of cartons in such manner that the lowermost one may be withdrawn downwardly from the stack, vacuum cups for engaging the lowermost carton, removing it from the magazine, partly erecting it and preliminarily bowing the top panel thereof, said magazine having a breaker rod to start the erection of the carton as it is withdrawn past said breaker rod, tuckers for dust tabs and the bottom end panel at one end of the carton, means for retaining said dust tabs and said end panel tucked to serve as a stop for the product inserted into the carton from the other end thereof, a tucker for dust tabs and the bottom end panel at the other end of the carton, dewaxers past which carton passes comprising heating plates and heaters therefor to remove part of the wax from the ends of the carton and the top end panels thereof to permit the application of glue thereto, holddown means for removing the bow from the top panel of the carton, tucking means for said top end panels to tuck them against the ends of the carton, means to heat said ends to set the glue, means to cool said ends to insure that the glue remains set, and means for discharging the sealed carton from the machine.

7. A cartoning machine comprising a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, said conveyor having carton-receiving dogs to engage the side

panels of the carton and bow the top panel thereof upwardly, tuckers for dust tabs and the bottom end panel at one end of the carton, means for retaining said dust tabs and said end panel tucked to serve as a stop for the product inserted into the carton from the other end thereof, a tucker for dust tabs and the bottom end panel at the other end of the carton, dewaxers past which the carton passes comprising heating plates and heaters therefor to remove part of the wax from the ends of the carton and the top end panels thereof to permit the application of glue thereto, holddown means for removing the bow from the top panel of the carton, tucking means for said top end panels to tuck them against the ends of the carton, means to heat said ends to set the glue, means to cool said ends to insure that the glue remains set, and means for discharging the sealed carton from the machine.

8. A cartoning machine comprising a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, said conveyor having carton-receiving dogs to engage the side panels of the carton and bow the top panel thereof upwardly, said magazine having projections for supporting said stack of cartons in such manner that the lowermost one may be withdrawn downwardly from the stack, vacuum cups for engaging the lowermost carton, removing it from the magazine, partly erecting it and preliminarily bowing the top panel thereof, said magazine having a breaker rod to start the erection of the carton as it is withdrawn past said breaker rod, tuckers for dust tabs and the bottom end panel at one end of the carton, means for retaining said dust tabs and said end panel tucked to serve as a stop for the product inserted into the carton from the other end thereof, a tucker for dust tabs and the bottom end panel at the other end of the carton, tucking means for said top end panels to tuck them against the ends of the carton, means to heat said ends to set the glue, means to cool said ends to insure that the glue remains set, and means for discharging the sealed carton from the machine.

9. In a cartoning machine of the character disclosed, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, said conveyor having dogs to engage the side panels of the carton and bow the top panel of the carton upwardly, said magazine having projections for supporting said stack of cartons in such manner that the lowermost one may be withdrawn downwardly from the stack, means for withdrawing the lowermost carton from said magazine and depositing it on said conveyor, tuckers for dust tabs and an end panel at one end of the carton, means for retaining said dust tabs and end panel tucked to serve as a stop for product inserted into the other end of the carton, a tucker for other dust tabs and the other end panel at the other end of the carton, dewaxers past which the carton passes comprising heating plates and heaters therefor to remove part of the wax from the ends of the carton and the top end panels thereof to permit the application of glue thereto, holddown means for removing the bow from the top panel of the carton and contacting the top end panels thereof with said dewaxing means, gluing means for said top end panels, tucking means for said top end panels to tuck them against the ends of the carton, means to heat said ends to set the glue, means to cool said ends to insure that the glue remains set, and means for thereafter discharging the carton from the machine.

10. In a cartoning machine of the character disclosed,

a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, said conveyor having dogs to engage the side panels of the carton and bow the top panel of the carton upwardly, said magazine having projections for supporting said stack of cartons in such manner that the lowermost one may be withdrawn downwardly from the stack, means for withdrawing the lowermost carton from said magazine and depositing on said conveyor, tuckers for dust tabs and an end panel at one end of the carton, means for retaining said dust tabs and end panel tucked to serve as a stop for product inserted into the other end of the carton, a tucker for other dust tabs and another end panel at the other end of the carton, holddown means for removing the bow from the top panel of the carton, gluing means for two of said end panels, tucking means for said two end panels to tuck them against the ends of the carton, means to heat said ends to set the glue, means to cool said ends to insure that the glue remains set, and means for thereafter discharging the carton from the machine.

11. In a cartoning machine of the character disclosed, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, carton-receiving dogs carried by said conveyor and biased to engage the side panels of the carton to hold it in an open position and bow the top panel thereof upwardly, said conveyor conveying the carton from the infeed end to the discharge end of said machine, means for removing the lowermost carton from said magazine and depositing it on said conveyor and between said carton-receiving dogs, tuckers for two dust tabs and one end panel of the carton, means for retaining said dust tabs and end panel tucked to serve as a stop for product inserted into the other end of the carton, tuckers for the other two dust tabs and the other end panel of the carton, dewaxers past which the carton passes comprising heater plates and heaters therefor to remove part of the wax from the ends of the carton and the top end panel thereof to permit the application of glue thereto, hold-down means for removing the bowl from the top panel of the carton and contacting the end panels thereof with said dewaxing means, gluing means for two of said end panels, tucking means for said two end panels to tuck them against the ends of the package, means to heat said ends to set the glue, and means to cool said ends to insure that the glue remains set.

12. In a cartoning machine, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with the panels of the carton bodies constituting the side, top and bottom panels thereof, and having end panels connected therewith, a conveyor having pairs of pivoted dogs for receiving a carton from said magazine and holding the carton in an open position, said dogs engaging the front and rear panels of the carton and being pivotally movable toward each other to inclined positions for bowing the top panel of the carton upwardly, said conveyor conveying the carton from the infeed end to the discharge end of said machine, means for removing the lowermost carton from said magazine and depositing it in a pair of dogs on said conveyor, means to tuck certain panels at one end of the carton to act as a stop for product introduced into the carton from the other open end thereof, means to thereafter tuck other panels at the open end of the carton, means to apply glue thereto, tucking means for the remaining panels to tuck them

against the ends of the carton, means to heat said ends to set the glue, and means to cool said ends to insure that the glue remains set.

13. In a cartoning machine of the character disclosed, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, said conveyor being provided with dogs to engage the side panels of the carton and bow the top panel of the carton upwardly, said magazine having projections for supporting the stack of cartons in such manner that the lowermost one may be withdrawn downwardly from the stack, means for removing the lowermost carton from said magazine and depositing it on said conveyor, tuckers for two dust tabs and one end panel of the carton, means for retaining said dust tabs and end panel tucked to serve as a stop for product inserted into the carton, and means for tucking the rest of the end panels of said carton into closed position and for sealing them in such position, said last means including heating means for setting the glue, and chilling means for insuring that the glue remains set.

14. A cartoning machine comprising a magazine for collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with panels of the carton bodies constituting the side, top and bottom panels thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons from said magazine, said conveyor having carton-receiving pockets provided with dogs to engage the side panels of the carton and bow the top panel of the carton upwardly, said magazine having means for supporting said stack of cartons in such manner that the lowermost one may be withdrawn downwardly from the stack, means for withdrawing the lowermost carton from said magazine and depositing it in a pocket of said conveyor, tuckers for two dust tabs and a bottom end panel of the carton, means for retaining said dust tabs and said bottom end panel tucked to serve as a stop for product inserted into the carton, and means for tucking the rest of the dust tabs and end panels of said carton into closed position and for sealing them in such position, said last means including gluing means and heating means for setting the glue.

15. In a cartoning machine of the character disclosed, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with the panels of the carton bodies constituting two panels and two sides thereof, and having dust tabs and end panels connected therewith, a conveyor for receiving cartons, one at a time, from said magazine with one panel of the carton flat against said conveyor, means carried by said conveyor to engage the sides of the carton and move them toward each other to acute angular relationship with said one panel of the carton whereby the other panel thereof will be bowed outwardly, tuckers for two dust tabs and a bottom end panel of the carton to serve as a stop for product inserted into the other end of the carton, means for tucking the rest of the dust tabs and end panels of said carton into closed position and for sealing them in such position, said last means including means for applying glue, heating means for setting the glue and chilling means for insuring that the glue remains set before the completed package with the product therein is discharged from the machine.

16. In a cartoning machine, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with the panels of the carton bodies constituting two panels and two sides thereof, and having dust tabs and end panels connected therewith, a conveyor having

means for receiving cartons from said magazine, holding the carton in open position and conveying it from the infeed end to the discharge end of said machine, said means comprising elements engageable with the sides of the carton to bend them toward each other whereby one panel of the carton is bowed away from said conveyor, means for removing the bottommost carton from said magazine and depositing it on said conveyor, tuckers for dust tabs and an end panel at one end of the carton to serve as a stop for product inserted into the other end of the carton, and means for tucking the rest of the dust tabs and end panels of the carton into closed position and for sealing them in such position.

17. In a cartoning machine of the character disclosed, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with the panels of the carton bodies constituting the side, top and bottom panels thereof, a conveyor for receiving cartons from said magazine, said conveyor having carton-receiving dogs to engage the side panels of the carton and bow the top panel of the carton upwardly, said magazine having projections for supporting said stack of cartons in such manner that the lowermost one may be withdrawn downwardly from the stack, vacuum cups for engaging the lowermost carton, withdrawing it from the magazine, partly erecting it and preliminarily bowing the top panel thereof, strippers for engaging said top panel to effect such bowing, a breaker element to engage the carton and start the erection thereof as it is withdrawn past said breaker element, and means for closing and sealing said carton after product has been inserted therein while the carton is held in bowed-open position by said carton-receiving dogs of said conveyor.

18. In a cartoning machine of the character disclosed, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with the panels of the carton bodies constituting the side, top and bottom panels thereof, a conveyor for receiving cartons from said magazine, said conveyor having carton-receiving dogs to engage the side panels of the carton and bow the top panel of the carton upwardly, said magazine having projections for supporting said stack of cartons in such manner that the lowermost one may be withdrawn downwardly from the stack, means for engaging the lowermost carton, withdrawing it from the magazine, partly erecting it and preliminarily bowing the top panel thereof, strippers for engaging said top panel during the withdrawing action to effect such bowing, and means for closing and sealing said carton after the insertion of product therein while the carton is held in bowed-open position by said carton-receiving dogs of said conveyor.

19. In a cartoning machine, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with the panels of the carton bodies constituting the side, top and bottom panels thereof, a conveyor for receiving cartons from said magazine, said magazine having projections for supporting said stack of cartons in such manner that the lowermost one may be withdrawn downwardly from the stack, said magazine having strippers for engaging the top panel only of the carton as it is withdrawn from said magazine to effect a bowing upwardly of said top panel to open the carton before depositing it on said conveyor, said conveyor having means to

hold the carton bowed open, and means for closing and sealing said carton after product is inserted therein while the carton is held in bowed-open position by said conveyor means.

20. In a cartoning machine of the character disclosed, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with the panels of the carton bodies constituting the front, rear, top and bottom panels thereof, and having end panels connected therewith, a conveyor having pairs of dogs for receiving cartons from said magazine and holding the carton in an open position, said conveyor conveying said carton from the infeed end to the discharge end of said machine, said dogs being pivoted to said conveyor, and each comprising a body portion of horizontally disposed V-shaped configuration with the ends thereof horizontally inclined away from an adjacent carton to bend the front and rear panels thereof toward each other and thereby the top panel thereof upwardly, stop means for limiting the pivotal movement of said dogs, means for removing the lowermost carton from said magazine and depositing it in a pair of dogs on said conveyor, means to tuck certain panels at one end of the carton to partially close that end for the reception of product into the other end thereof, and means for tucking the rest of the end panels of said carton into closed position and for sealing them in such position, said last means including gluing means, heating means for setting the glue, and chilling means for insuring that the glue remains set before the completed package with the product therein is discharged in sealed condition from the machine.

21. In a cartoning machine of the character disclosed, a magazine for a stack of collapsed cartons, the carton bodies being operated upon being of rectangular configuration and horizontally disposed with the panels of the carton bodies constituting the side, top and bottom panels thereof, a conveyor for receiving cartons from said magazine, said conveyor having carton-receiving dogs to engage the side panels of the carton and bow the top panel of the carton upwardly, said magazine having projections for supporting said stack of cartons in such manner that the lowermost one may be withdrawn downwardly from the stack, vacuum cups for engaging the lowermost carton, withdrawing it from the magazine, partly erecting it and depositing it between said dogs, a breaker element to engage the carton and start the erection thereof as it is withdrawn past said breaker element, and means for closing and sealing said carton after product has been inserted therein while the carton is held in bowed-open position by said carton-receiving dogs of said conveyor.

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