

Dec. 4, 1945.

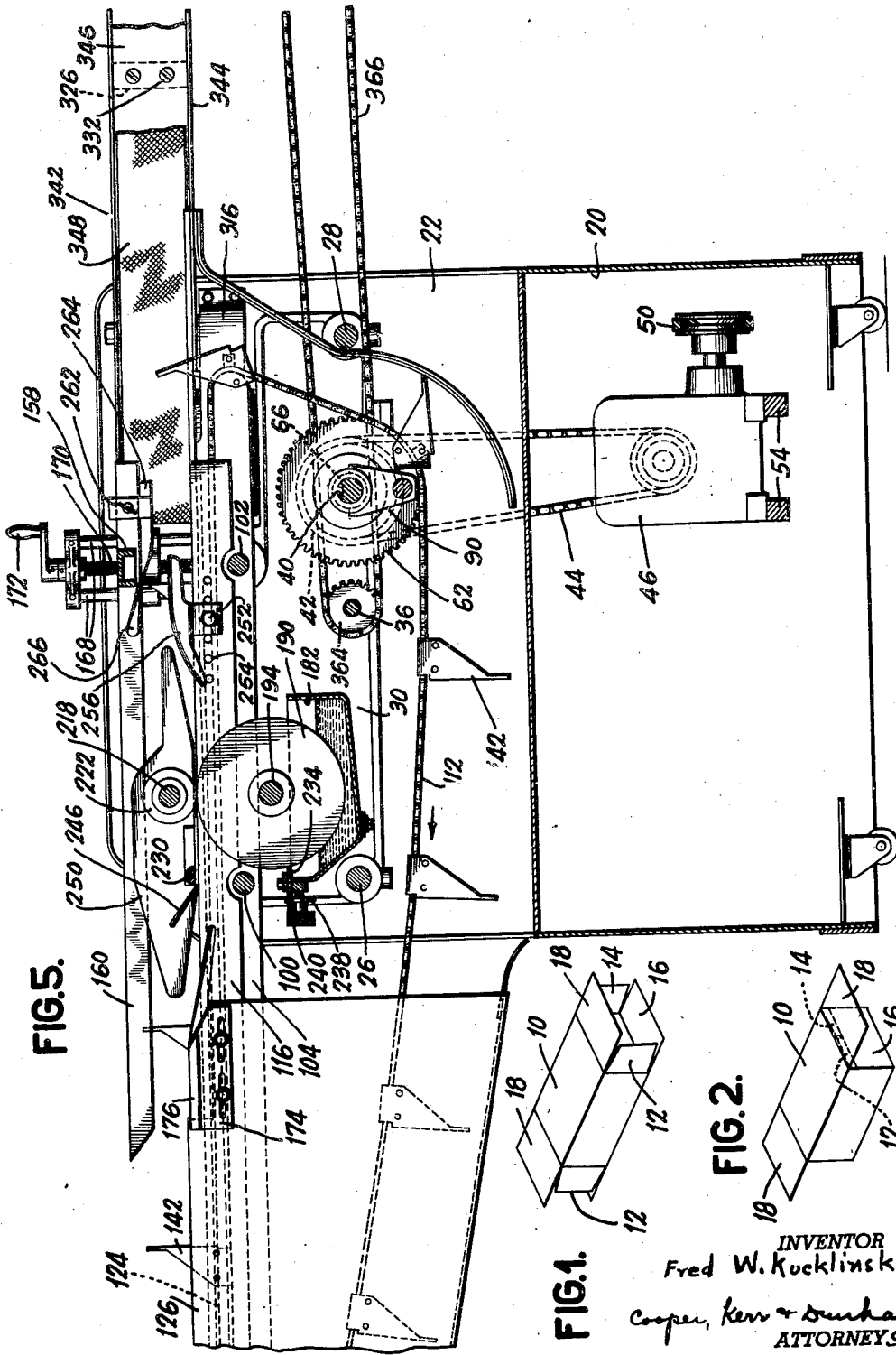
F. W. KUCKLINSKY

2,390,107

PACKAGING MACHINE

Filed Aug. 28, 1941

6 Sheets-Sheet 1



INVENTOR
Fred W. Kucklinsky
Cooper, Kerr & Durham
ATTORNEYS

Dec. 4, 1945.

F. W. KUCKLINSKY

2,390,107

PACKAGING MACHINE

Filed Aug. 28, 1941

6 Sheets-Sheet 2

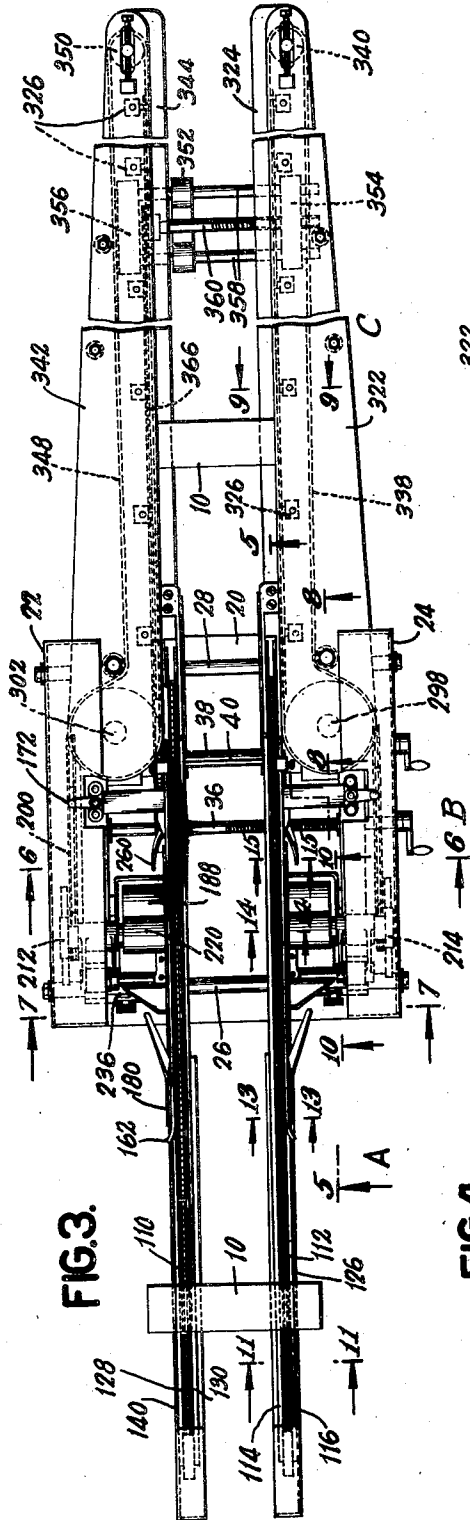
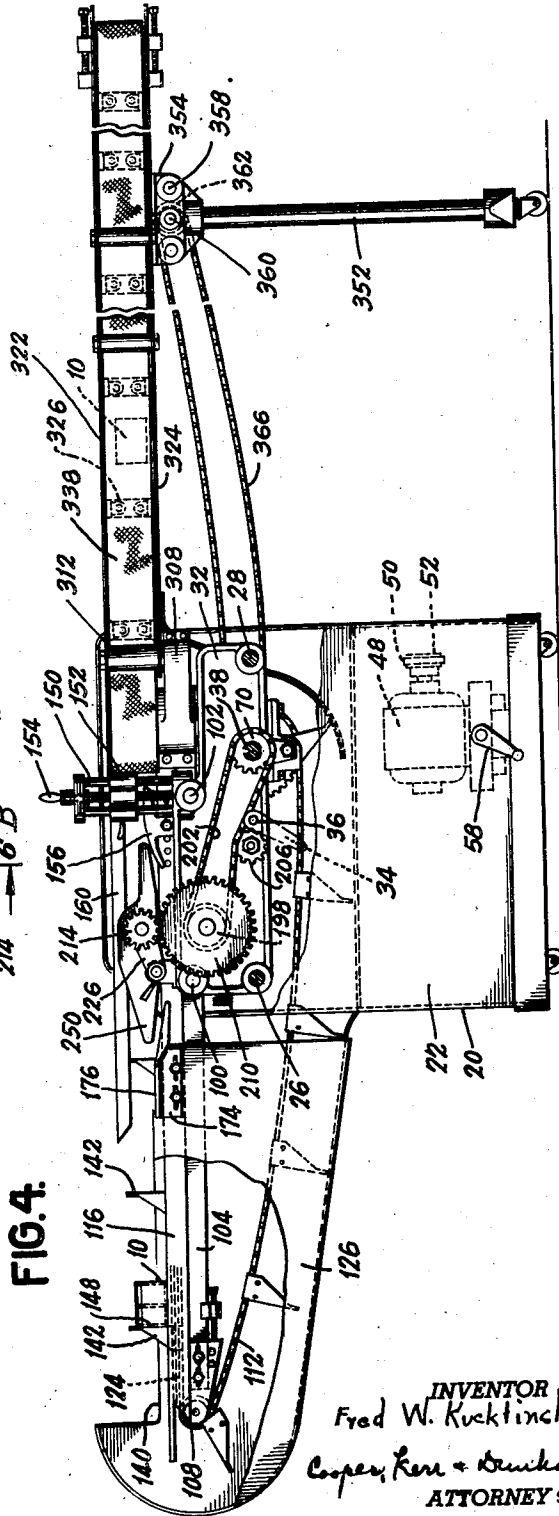


FIG. 4.



INVENTOR
Fred W. Kucklinsky
Cooper, Kerr & Benham
ATTORNEYS

Dec. 4, 1945.

F. W. KUCKLINSKY

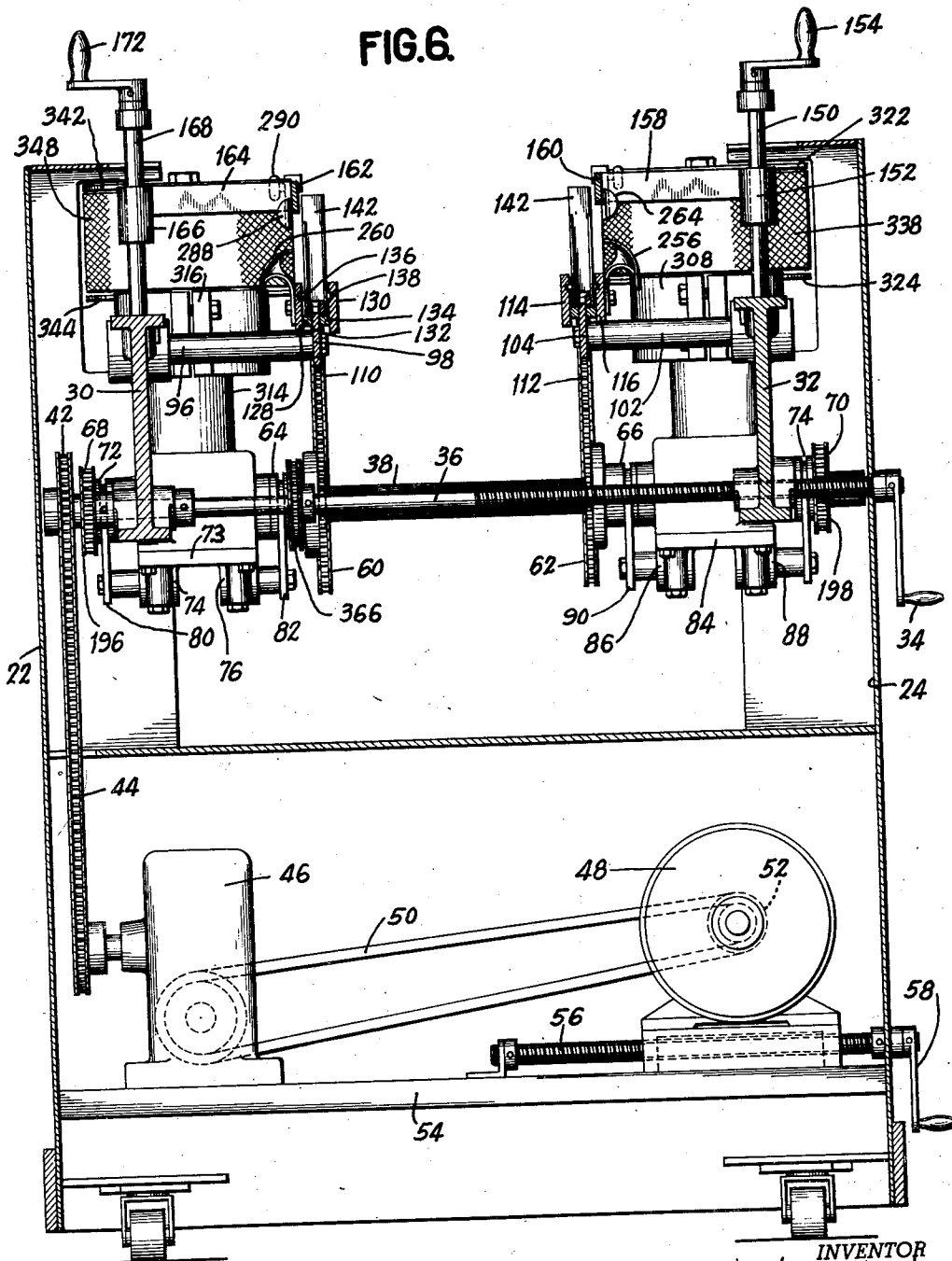
2,390,107

PACKAGING MACHINE

Filed Aug. 28, 1941

6 Sheets-Sheet 3

FIG. 6.



BY

INVENTOR
Fred W. Kucklinsky
Cooper, Kerr & Driskell
ATTORNEYS

Dec. 4, 1945.

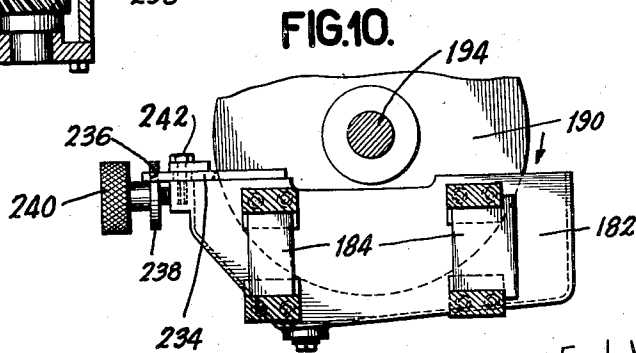
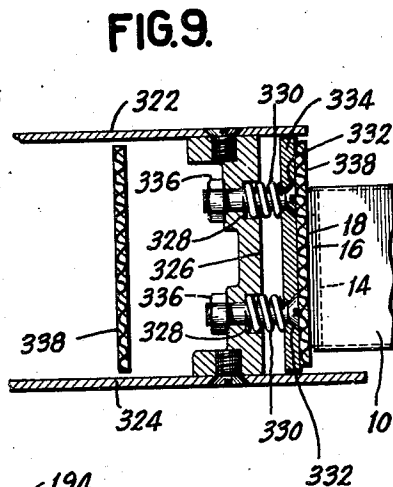
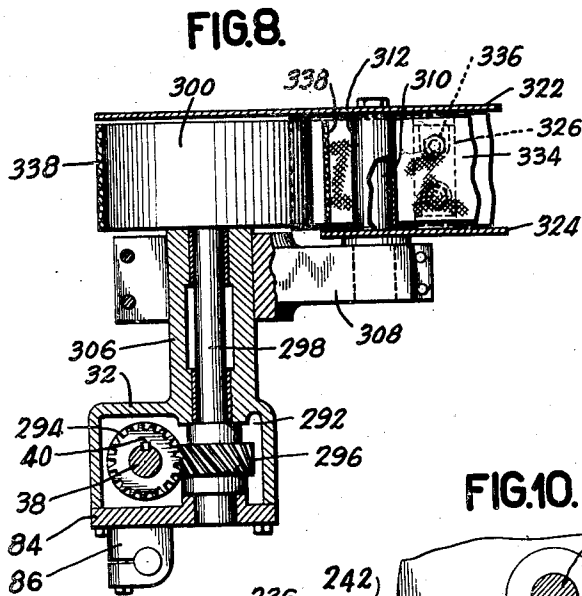
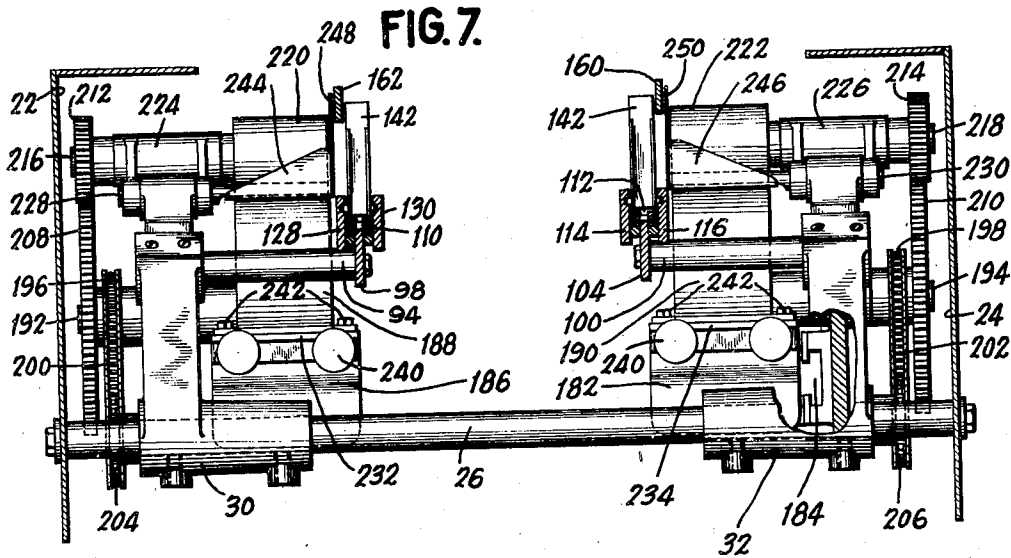
F. W. KUCKLINSKY

2,390,107

PACKAGING MACHINE

Filed Aug. 28, 1941

6 Sheets-Sheet 4



BY

INVENTOR
Fred W. Kucklinsky
Cooper, Kerr & Dunkham
ATTORNEYS

Dec. 4, 1945.

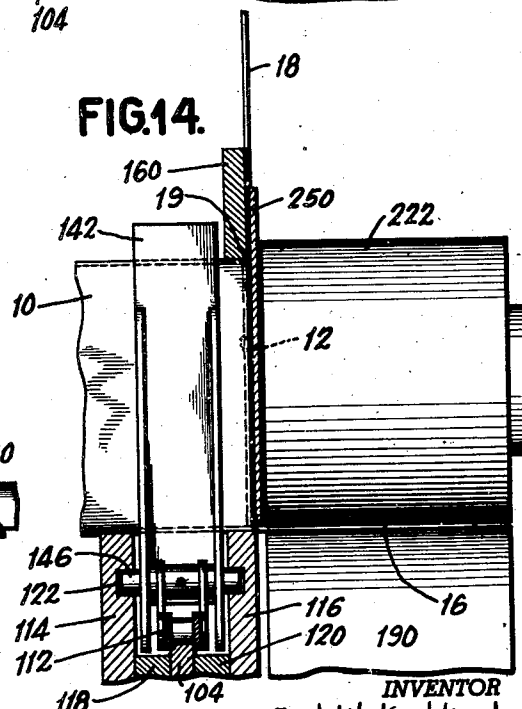
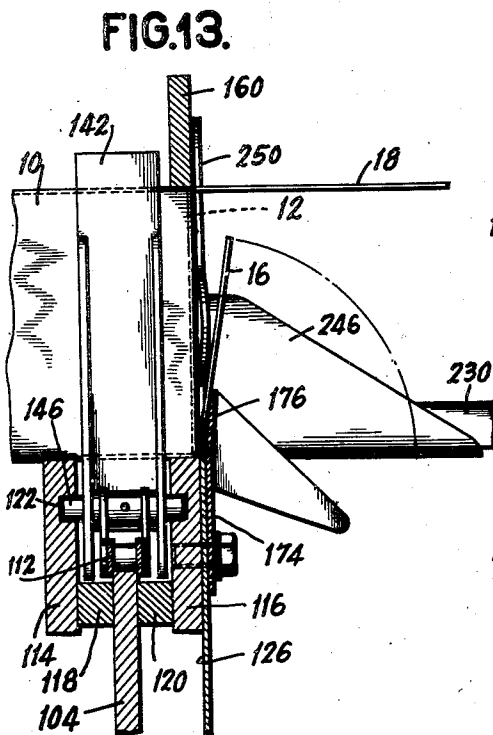
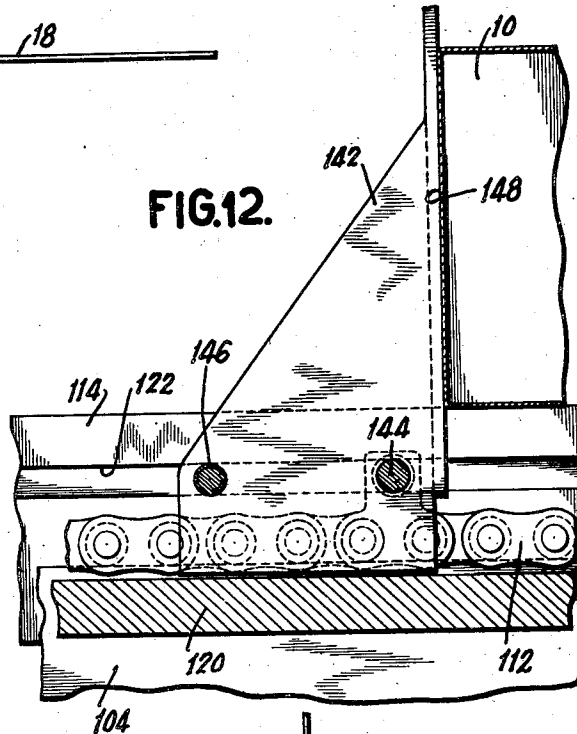
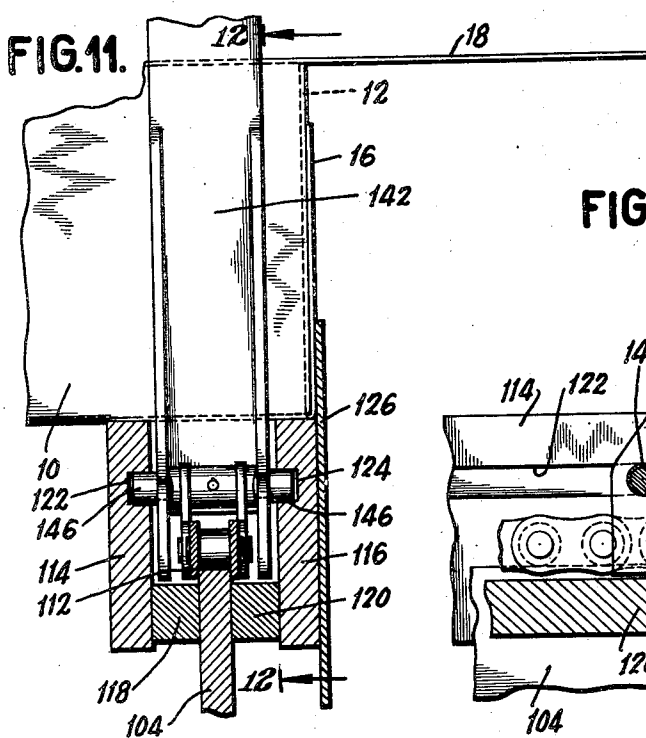
F. W. KUCKLINSKY

2,390,107

PACKAGING MACHINE

Filed Aug. 28, 1941

6 Sheets-Sheet 5



INVENTOR
Fred W. Kucklinsky
BY
Cooper, Kerr & Dunham
ATTORNEYS

Dec. 4, 1945.

F. W. KUCKLINSKY

2,390,107

PACKAGING MACHINE

Filed Aug. 28, 1941

6 Sheets-Sheet 6

FIG.15.

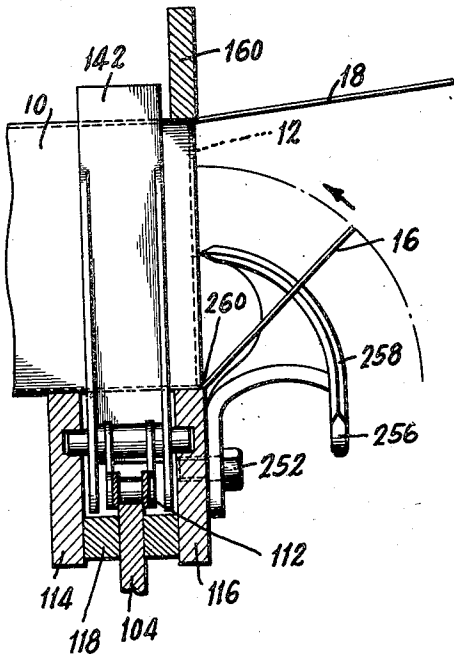


FIG.16.

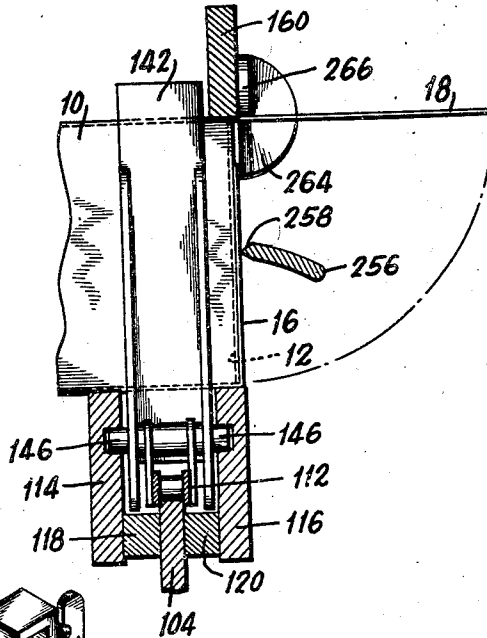


FIG.17.

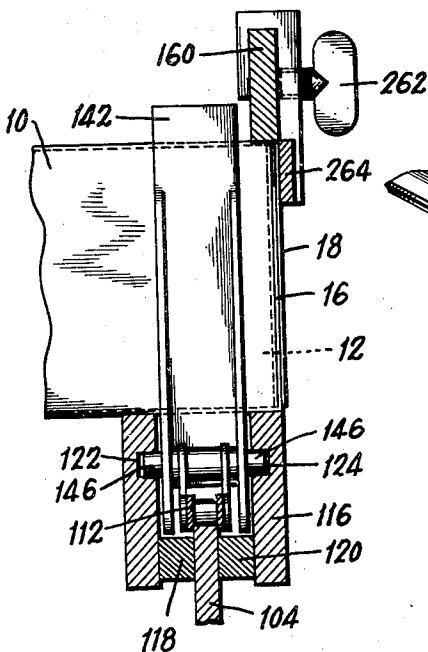


FIG.19.

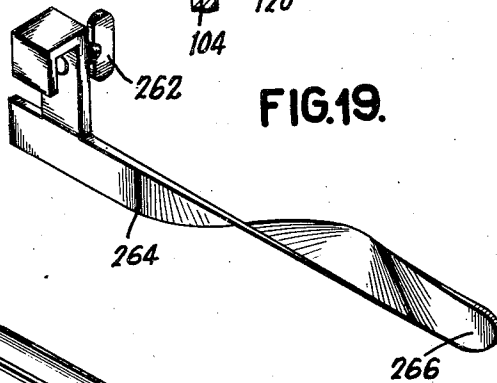
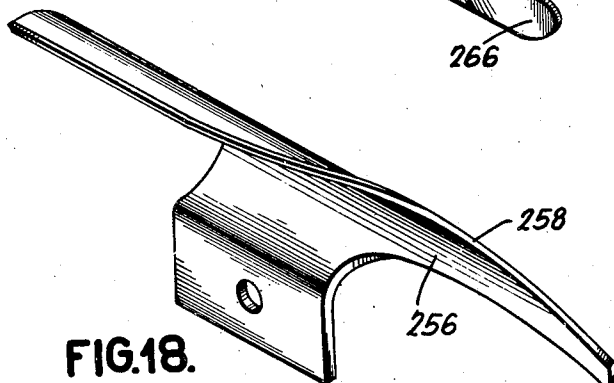


FIG.18.



INVENTOR
Fred W. Kucklinsky
BY
Cooper, Kerr + Drunkham
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,390,107

PACKAGING MACHINE

Fred W. Kucklinsky, Newark, N. J., assignor to
Esther M. Kucklinsky, Montclair, N. J.

Application August 28, 1941, Serial No. 408,593

2 Claims. (Cl. 93-6)

This invention relates generally to packaging machines, and has particular reference to machines for closing and sealing pasteboard and paper cartons.

A main object of the invention is to provide a machine which will close and seal both ends, or the top and bottom, of a carton, and which can be quickly set up by unskilled operators to close and seal cartons of various sizes or cartons of various relative dimensions. Large and small cartons, or cartons which are of various heights and widths may, therefore, be sealed by employing a single machine instead of its being necessary to have a plurality of machines for use in a plant where the products make it necessary to use a number of different cartons.

Another object is to provide a machine which will close and seal a carton while preserving the intended shape of the carton. This control over the shape of the carton makes it possible to use satisfactorily relatively light weight carton material, although this feature is also valuable in connection with any of the papers or cardboards (including corrugated paper) ordinarily used in the manufacture of cartons.

Still another object is to provide a mechanism for applying glue or other adhesive to both sides of one of the flaps of the container and then moving the flap to sealing position against other flaps without removing any of the glue from either side. This makes the gluing mechanism very efficient and prevents the glue from being displaced to points where it might clog the mechanism or otherwise interfere with correct operation.

Another object and advantage is that during the various steps of closing and sealing the carton the contents of the carton are prevented from escaping, thereby making it possible to use the apparatus for closing and sealing cartons whose contents are in the form of small grains or particles.

With the foregoing, and other objects and advantages which will become apparent later on, the invention consists in a construction and relative arrangement of parts, an embodiment of which appears in the drawings accompanying and forming a part of this specification, the novel features of the invention being pointed out in the claims appended hereto.

In said drawings:

Fig. 1 is a view illustrating a carton before packing.

Fig. 2 is a view illustrating a carton ready to be placed in the machine for sealing.

Fig. 3 is a plan view of the machine.

Fig. 4 is a right side elevation of the machine.

Fig. 5 is a sectional view taken on the lines 5-5 of Fig. 3.

Fig. 6 is a sectional view taken along the line 6-6 of Fig. 3.

Fig. 7 is a sectional view taken along the line 7-7 of Fig. 3.

Fig. 8 is a fragmentary sectional view taken on the line 8-8 of Fig. 3.

Fig. 9 is a sectional view of one of the compression belts taken along the line 9-9 of Fig. 3.

Fig. 10 is a view of a glue pot taken along line 10-10 of Fig. 3.

Fig. 11 is a sectional view of a track taken along the line 11-11 of Fig. 3.

Fig. 12 is a sectional view taken along the line 12-12 of Fig. 11.

Fig. 13 is a sectional view of a track taken along the line 13-13 of Fig. 3.

Fig. 14 is a sectional view taken along the line 14-14 of Fig. 3.

Fig. 15 is a sectional view taken along the line 15-15 of Fig. 3.

Fig. 16 is a sectional view taken along the line 16-16 of Fig. 3.

Fig. 17 is a sectional view taken a little further back of Fig. 16.

Fig. 18 is a perspective view of the glued flap folding plow.

Fig. 19 is a perspective view of the outer flap folding plow.

One type of carton which the machine is designed to close and seal is shown at 10 in Fig. 1. It has small flaps 12 and 14 which are closed by hand after the particular merchandise to be packed is inserted in the carton by the operator. The lower flap 16 is also turned up by hand while the outer flap 18 is left in its original position, the flaps then appearing as shown in Fig. 2. The carton 10 containing the merchandise is then placed on the machine to be closed and sealed.

As viewed in Fig. 3, the machine may be divided into three sections; a loading section "A," a sealing section "B" and a compression or drying section "C." Sections A and C may be of any desired length depending upon the number of operators placing cartons on the machine, type of carton, drying time, etc.

The mechanism of the sealing section B is supported by a hollow frame 20 having two upstanding walls 22 and 24 in which are mounted two cross rods 26 and 28. A left hand frame member 30 (Fig. 6) is fastened tightly to the cross rods and a right hand frame member 32 (Fig. 4) is arranged to slide on the cross rods. Frames

30 and 32 are almost identical except that they face in opposite directions. Furthermore, each frame carries practically identical mechanism.

To provide adjustment for cartons of various depths, provision is made to slide the frame 32 toward and away from the fixed frame 30, by means of a crank 34, fastened to a rod 36 (Fig. 6). One end of rod 36 is journaled in the frame 30, and the other end is threaded to engage corresponding threads in the frame 32.

Journalled in the frames 30 and 32 is a main drive shaft 38 in which is a keyway 40 extending the entire length of the shaft (Figs. 3 and 6). Fastened tightly on the left hand end of shaft 38 is a sprocket 42, driven by a chain 44 from a speed reducer 46, which in turn is driven by a motor 48 through a belt 50 and a variable speed pulley 52. The motor 48 is arranged to be slidably adjusted on cross bars 54 by means of screw 56 and crank 58.

Referring to Figs. 4, 5 and 6: Keyed to the shaft 38 yet slidable thereon, are two large sprockets 60 and 62 having hubs with annular grooves 72 and 74 respectively. On the under side of frame member 30 is a cover 73 with bosses 74 and 76 carrying forked members 80 and 82 respectively. The fork 80 engages the annular groove 72 in the hub of sprocket 60, while the fork 82 engages the annular groove 74 of the sprocket 62. Likewise, a cover 84 on the under side of the frame 32 has bosses 86 and 88 which carry forked members 90 and 92 respectively. The fork 90 engages the annular groove 72 in the hub of the sprocket 62, and fork 92 engages the annular groove 74 of the sprocket 60. In this fashion, all four sprockets are held in proper relationship with the frames 30 and 32, and as the frame 32 is moved along the shaft 38 the sprockets 62 and 70 move along with the frame while still being keyed to the shaft in keyway 40.

Projecting from the frame 30 are two short rods 94 and 96 (Figs. 6 and 7) which rigidly support a track 98 parallel with the frame 30 and extending to the loading section A or front end of the machine. The track 98 is mounted directly over the sprocket 60. In a like manner the frame 32 carries two short rods 100 and 102 which support a similar track 104 directly over the sprocket 62. On the forward ends of the tracks 98 and 104 are adjustably mounted sprockets 106 and 108 respectively. These sprockets are directly in line with their respective tracks. A conveyor chain 110 of such width that the links of the chain just straddle track 98 is disposed to operate over sprockets 60 and 106 and along the top of the track 98. A similar chain 112 operates over sprockets 62 and 108 and along the top of the track 104.

As best shown in Figs. 11 and 12, the track 104 has parallel guides 114 and 116 fastened on either side of it through spacing strips 118 and 120. The top edges of the parallel guides 114 and 116 are smooth and parallel with the top edge of the track 104. Grooves 122 and 124 are cut the entire length of and parallel with the top edges of guides 114 and 116, respectively. Attached to the side of the guide 116 is a guard plate 126 which extends above the top surface of the guide.

As shown in Fig. 7, track 98 also has parallel guides 128 and 130 and spacing strips 132 and 134. Grooves 136 and 138 are cut in the sides of and extend the entire lengths of guides 128 and 130 respectively. A guard plate 140 is also attached to the guide 128 (Figs. 3 and 4).

At spaced intervals on the conveyor chains 98

and 112 are hands 142, pivotally mounted on the chains by pins 144 as shown in Figs. 11 and 12. Accurately located pins 146 are riveted into the side walls of the hands so that a line through the centers of pins 144 and 146 will form an angle of 90° with the face 148, of the hand. As shown in Figs. 5 and 12, after a hand 142 has traveled around the sprocket 108, the pins 144 and 146 are guided into the grooves 122 and 124 in guides 114 and 116. Thus, throughout the travel of any hand along the tracks 98 and 104, the face 148 of the hand will be held perpendicular to the guide surface of the track. The conveyor chains 110 and 112 and the hands 142 are so matched that a carton 10 placed between plates 126 and 140 and against the faces 148 will be perpendicular to the line of the track as shown in Figs. 3 and 4. This is an important part of the construction for preserving the rectangular shape of the cartons during sealing operations.

Extending upward from the top of the frame 32 (Figs. 4 and 6) are two parallel rods 150 guiding a sliding member 152 which is movable up or down by means of a crank 154 and screw 156. The member 152 has an extending arm 158 which supports an aligning bar 160 directly over and parallel with guide 116 on the track 104.

A similar aligning bar 162 is supported over the guide 128 on the track 98 from the frame 30 by an arm 164 on a member 166 sliding on a pair of rods 168 and movable by a screw 170 and crank 172 (Figs. 5 and 6). The aligning bars 160 and 162 are adjustable to the width of the carton 10 so that as the carton moves along on the supporting and guiding surfaces, it just goes under the bars 160 and 162 and is then supported on three sides and both ends to assure squareness both before and after sealing.

As shown in Figs. 3, 4, 5 and 13, the upper right hand corner of the plate 126 is cut down to the level of the guide 116. At this point is an adjustably mounted bracket 174 having a flared out portion 176. On the left hand side of the machine, plate 140 has a similar cut out corner and a bracket 178 with a flared out lip 180.

A readily removable glue pot 182 is hung on the frame 32 by means of slides 184 (Figs. 5, 7 and 10). In a similar manner another glue pot 186 is attached to the frame 30.

Glue rollers 188 and 190 in the glue pots 186 and 182 are mounted on the frames 30 and 32, respectively. The rollers 188 and 190 have fastened to the opposite ends of their shafts 192 and 194 sprockets 196 and 198 driven by chains 200 and 202 from the sprockets 60 and 70 on the shaft 38. The chains 200 and 202 run over suitable idler take up sprockets 204 and 206. The hubs of the sprockets 196 and 198 also carry gears 208 and 210, which mesh with pinions 212 and 214 on shafts 216 and 218 to turn rollers 220 and 222 at the same surface speed as the glue rollers 188 and 190. The shafts 216 and 218 are journaled in arms 224 and 226, which are pivotally mounted on studs 228 and 230 on the frames 30 and 32, respectively. Ordinarily the small glue rollers 220 and 222 run in contact with the large glue rollers 188 and 190 and pick up a coating of glue from the large rollers which dip into the glue pots. When the flap 16 of a carton is fed between the large and the small rollers, the latter are raised the thickness of the cardboard by the flap itself, and a coating of glue is applied to each side of the flap by the rollers.

Adjustably mounted on the glue pots 186 and 182 are scraper blades 232 and 234, respectively

(Figs. 3, 5, 7 and 10). These blades each have two slots 236 which receive the collars 238 of four adjusting screws 240. After the scraper blades are adjusted by the screws 140 to attain the proper coating of glue on rollers 188 and 190 the blades are locked in place by cap screws 242.

Studs 228 and 230 extend from the frames 30 and 32 and are flattened on their under sides to facilitate the attachment of deflector blades 244 and 246 (Fig. 5) which guide the flap 16 of the carton through the glue rollers. The deflector blades are bent to form plates 248 and 250 perpendicular to and parallel with the tracks 98 and 104 and parallel with the aligning bars 160 and 162. The plates 248 and 250 fit closely against the flaps 12 and 14 and hold them closed, the plates and said flaps preventing escape of contents from the cartons while the other flaps are being glued and moved to sealing positions.

Adapted to be attached by a cap screw 252 in any one of a series of holes 254 in the guide 116 is a plow blade 256 (Figs. 5, 15 and 18) which has a knife edge 258 of such contour as to guide the glued flap 16 of the carton to a closed position as shown in Fig. 15 and to hold it closed until the outside flap 18 is brought down a sufficient distance to keep all the flaps closed. As shown in Fig. 15, the knife edge 258 is formed on a radius struck from the point 260 where the flap 16 is hinged to the carton 10. Thus as the flap is urged to swing upward by the blade 256, the knife edge 258 inscribes a straight-line path over the glued surface of the flap 16 and therefore no scraping action takes place to remove glue. Such scraping action would prevent proper sealing and the glue would accumulate and foul the knife edge 258. After the glued flap is swung up into a position against the inner flaps 12 and 14 of the carton, the knife edge 258 follows a path parallel with the track 104 to hold the flaps in position as shown in Fig. 16.

On the left hand side of the machine the guide 128 carries a similar plow blade 260 curved in an opposite direction to the curve on blade 256.

Adjustably fastened to aligning bar 160 by a thumb screw 262 is a plow blade 264, bent as shown in Figs. 5, 16 and 19. The blade 264 extends parallel with the track 104 and aligning bar 160, then bends 180° so that the upper edge becomes the lower edge and the tail portion 266 extends in the same direction as and parallel with 264. As shown in Figs. 16 and 17, the outer flap 18 of a carton 10 is brought under the tip 268 of the guide and as the carton is moved further along the track by the hand 142 on the conveyor, the curved portion of the blade 264 urges the flap downward and finally (Fig. 17) the parallel portion of 264 presses the flap against the glued flap 16 and holds the carton closed until the compression stage C is reached.

The aligning bar 162 carries a similar plow blade 288 bent in a reverse fashion and fastened by a thumb screw 290 and serving to close the flap 18 at the other end of the carton.

Referring now to Fig. 8, the frame 32 forms a housing 292 for a spiral gear drive to operate the compression section C of the machine. A spiral gear 294 is keyed to the shaft 38, yet is slidable thereon. The gear 294 slides with the frame 32, while the latter is being adjusted. A mating spiral gear 296 is driven by 294 to turn a shaft 298 on the upper end of which is fastened a pulley 300. By a similar construction (not shown) in frame 30, a shaft 302 (Fig. 3) drives a pulley 304 on the left side of the machine.

On the frame 32 is formed a boss 306 which carries an arm 308, in which is clamped a pin 310 on which a roller 312 (Figs. 3, 4 and 8) is rotatably supported. On the frame 30 is a similar boss 314 carrying an arm 316 and a pin 318 on which is a roller 320.

Spaced by the pin 310 are two plates 322 and 324 extending toward the rear of the machine. The plates are further spaced by spacers 326 (Figs. 5 and 9) secured at intervals between 322 and 324. The spacers 326 are recessed and drilled at 328 to receive compression springs 330 and screws 332. Supported by the screws 332 is a compression plate 334 which is slightly narrower than the spacing of the plates 322 and 324 to allow freedom of movement. Screws 332 and nuts 336 provide adjustment against the springs 330.

An endless canvas belt 338 (Fig. 3) is extended about the pulley 300 and over adjustable idler pulley 340.

In the same way, on the left hand side of the machine two plates 342 and 344 are spaced by the pin 318 and spacers 326. A compression plate 346 is supported in a similar way by screws 332 and forced out by springs 330. An endless belt 348 passes over pulley 304 and idler pulley 350.

It should be noted here that the machine is so designed that the conveyor chains, 110 and 112, the glue rollers 182, 186, 220 and 222 and the compression belts 338 and 348 all operate at the same surface speed.

To support the weight of the compression section, a stand 352 (Fig. 4) is employed. To the under side of plates 324 and 344 are attached bearing blocks 354 and 356, respectively. Rods 358 pass through the bearing 354 and stand 352, and are tightly fastened in the bearing 356. A threaded rod 360 is journaled and secured against endwise movement in the bearing block 356. The threaded end engages corresponding threads in the block 354. Tight on 360 is a sprocket 362. On adjusting screw 36 (Figs. 3 and 4) is pinned a sprocket 364 the same size as 362. A chain 366 operates over both sprockets. Thus the rotation of the screw 36 is transmitted to the screw 360, and since the pitch of the threads on both screws is the same, the entire right hand portion of the machine receives the same adjustment both at the center and at the compression end.

To briefly summarize the operations of sealing a carton: The carton 10 is filled and folded as shown in Fig. 2 and placed on guides 114, 116, 128 and 130 at the loading end of the machine as illustrated in Figs. 3 and 4. Side plates 126 and 140 keep the flaps 12, 14, and 16 at each end closed and thus retain the contents. Constantly moving hands 142 (Fig. 11) push the carton 10 along the guides and under the aligning bars 160 and 162. The carton is now confined by three square surfaces at each end and thus is definitely squared up.

From this point the manipulation of the flaps on one end of the carton only will be described, it being understood that both ends receive the same treatment at the same time. When the plate 174 is reached (Fig. 13) flap 16 is allowed to drop out slightly against the bent lip 176. The point of the plate or plow 250 now enters between the flap 16 and the small flaps 12 and 14 and holds 12 and 14 closed until such time as 16 is returned to its closed position. Further travel along the tracks allows 16 to fall still further until it enters under deflector plate 246 and

it is then guided between the glue rollers 190 and 222 (Fig. 14) where glue is simultaneously applied to both sides of the flap. Meanwhile the upper sloping edge of the plate 250 has come under the flap 18 and has bent the flap up into a perpendicular position between plate 250 and aligning bar 160. This serves to break the scored corner 19 (Fig. 14) of the carton to assure a sharp corner when the flap later is bent down and the carton is finally sealed.

Further travel of the carton along the tracks finds the leading edge of the glued flap 16 over the folding plow 256. Guided by the curved portion of the knife edge 258, the glued flap is bent back to its closed position and is held against the flaps 12 and 14 by the straight portion of the edge 258 (Figs. 15 and 16).

The outer flap 18 is now brought under the influence of the tip 266 of the plow 264, and still further travel of the carton 10 finds the flap 18 folded down to its closed position against the glued surface of the flap 16 by the action of the plow 264, which now holds the carton closed until the compression belt 338 is reached (Figs. 16 and 17).

As the carton 10 moves along further, it is delivered by the hands 142 to the compression belts 338 and 348, which carry it to the rear of the machine as shown in Figs. 3 and 9. Pressure is exerted against the glued flaps by the springs 330 which press the compression plates 334 and 346 toward each other. This pressure also affords sufficient friction between the belts and the cartons to convey the cartons along. Due to this flexible construction, small variations in the depths of the cartons are equalized.

From all of the foregoing it is apparent that the apparatus may be quickly adjusted to seal cartons of various dimensions by operating the crank 34 to move the track 184 and the associated carrier chain and guides in or out with respect to the stationary guide 98 and the parts associated therewith, and that this movement will, through the chain 366, effect a corresponding adjustment of the compression belt 338. This gives the setup necessary for one dimension, the depth of the carton in the illustrated operation. The guides 160 and 162 may be similarly raised and lowered by operations of the cranks 154 and 172. The arrangement is such that cartons varying in size and relative dimensions over a wide range may be sealed by making the sample adjustments as indicated.

It will also be apparent that the apparatus maintains control over the carton material at all times so that the carton has the right shape when finally sealed; and that, in sealing, the various guides, including the guide plates 248 and 250, retain control over the flaps to such an extent as to prevent any escape of the contents from the container while the sealing operation is being carried out.

In explaining the invention it has been neces-

sary to describe in detail the construction and operation of the illustrative embodiment shown in the drawings, but it is apparent that the invention is capable of various embodiments, with suitable changes in the construction and relative arrangement of the parts, and it is therefore not the desire to be limited by the description and drawings except to the extent indicated in the claims which follow.

10 What is claimed is:

1. In a machine for closing and sealing a rectangular carton having a closure flap extending from each of the four sides of the carton, a conveyor or carrier on which a carton is placed with three of the flaps manually folded in substantially the positions they will occupy in the completed closure, a pair of glue applying rollers, guides for turning one of the three flaps outward and directing it between said rollers whereby glue is applied to both sides of the flap, one of said guides cooperating with the other two of the three flaps to keep the contents in the carton, a portion on said one guide for folding the fourth flap outward at an angle to break the material along the fold line of said fourth flap, a guide having a helical edge and a straight edge for first folding the glued flap against the other two flaps and then holding it against said flaps, a curved guide for folding the fourth flap down against the exposed glued surface of the third flap while said third flap is being held by the aforesaid straight edge, and means on the conveyor or carrier for moving the carton through and past all of the aforesaid guides whereby to close and seal the carton.

2. In a machine for closing and sealing a rectangular carton having a closure flap extending from each of the four sides of the carton, a conveyor or carrier on which a carton is placed with three of the flaps manually folded in substantially the positions they will occupy in the completed closure, a pair of glue-applying rollers, guides for turning one of the three flaps outward and directing it between said rollers whereby both sides of the flap are substantially covered with glue, one of said guides being constructed to cooperate with the other two of the three flaps to keep the contents of the carton from escaping between the adjacent edges of said two flaps, a sheet metal guide having a helical edge portion acting on the outer glued surface of the glued flap to first fold the glued flap against the other two flaps and a straight edge portion for holding it against said two flaps, said helical portion and said straight portion being constructed to draw a substantially straight line across the glue on the flap, a curved guide for folding the fourth flap down against the exposed glued surface of the third flap, and means on the conveyor or carrier for moving the carton through and past the glue-applying rollers and all of the aforesaid guides whereby to close and seal the carton.

FRED W. KUCKLINSKY.