

Jan. 3, 1928.

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C. H. WILD

CARTON CLOSING MACHINE

Filed Sept. 23, 1921

7 Sheets-Sheet 1

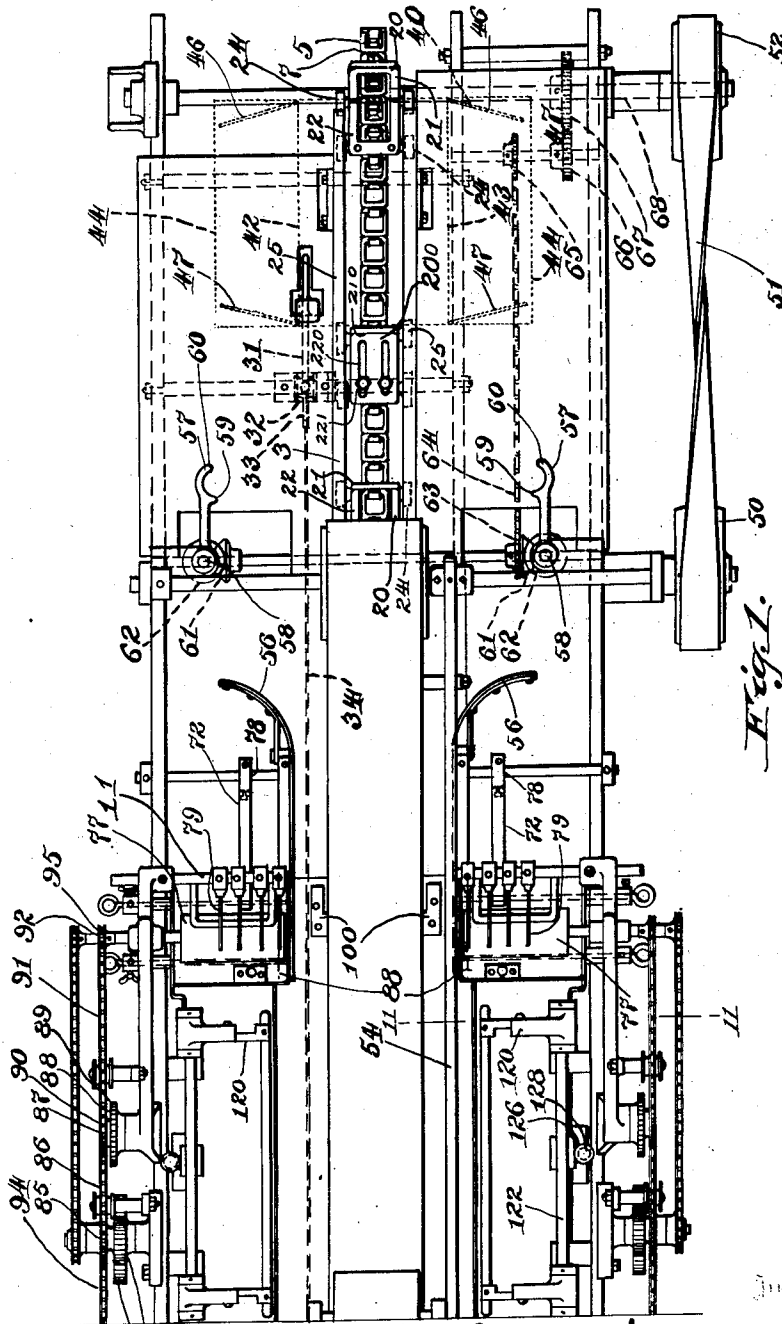


Fig. 1.

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7 Sheets-Sheet 2

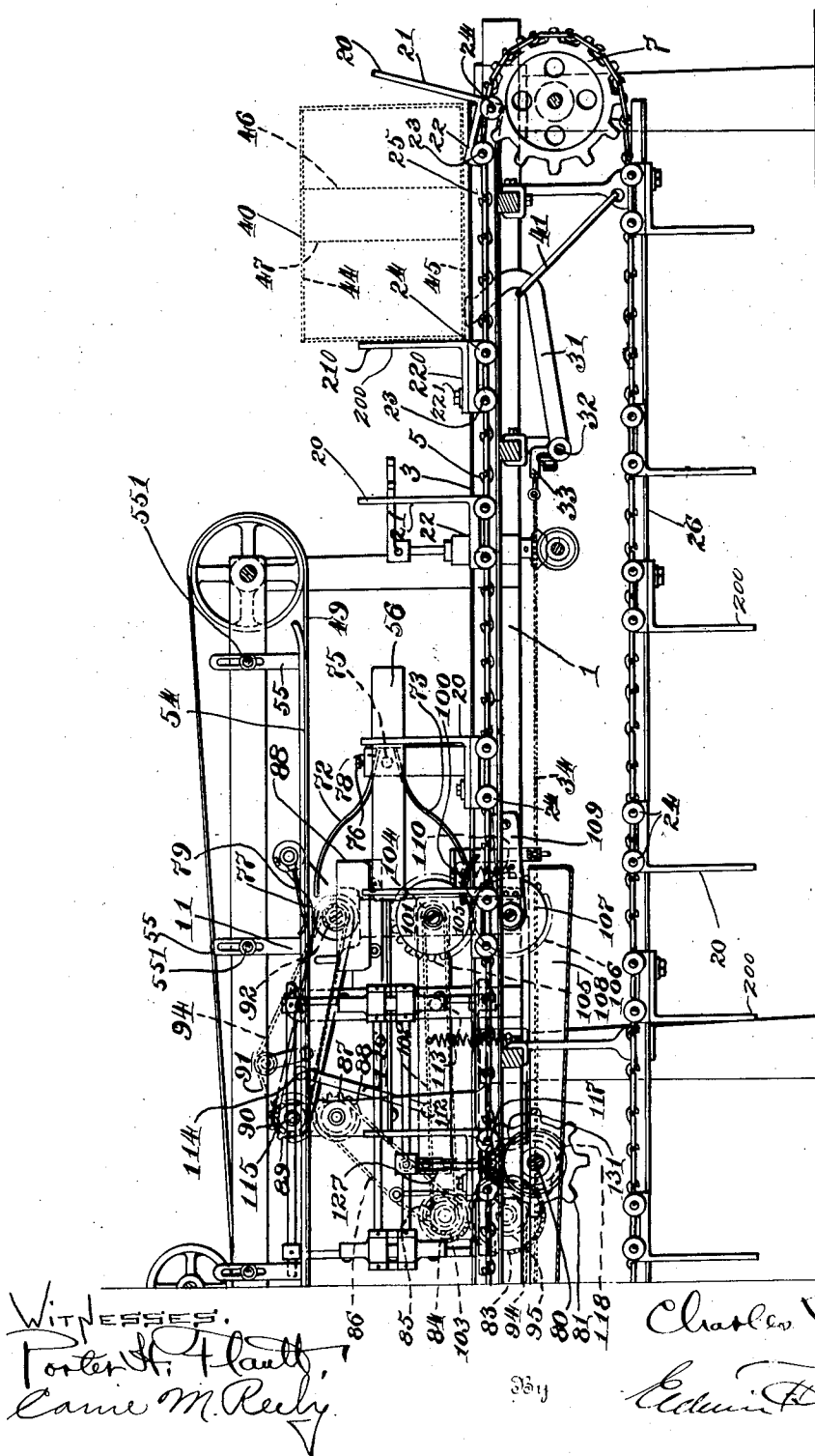


Fig. 2.

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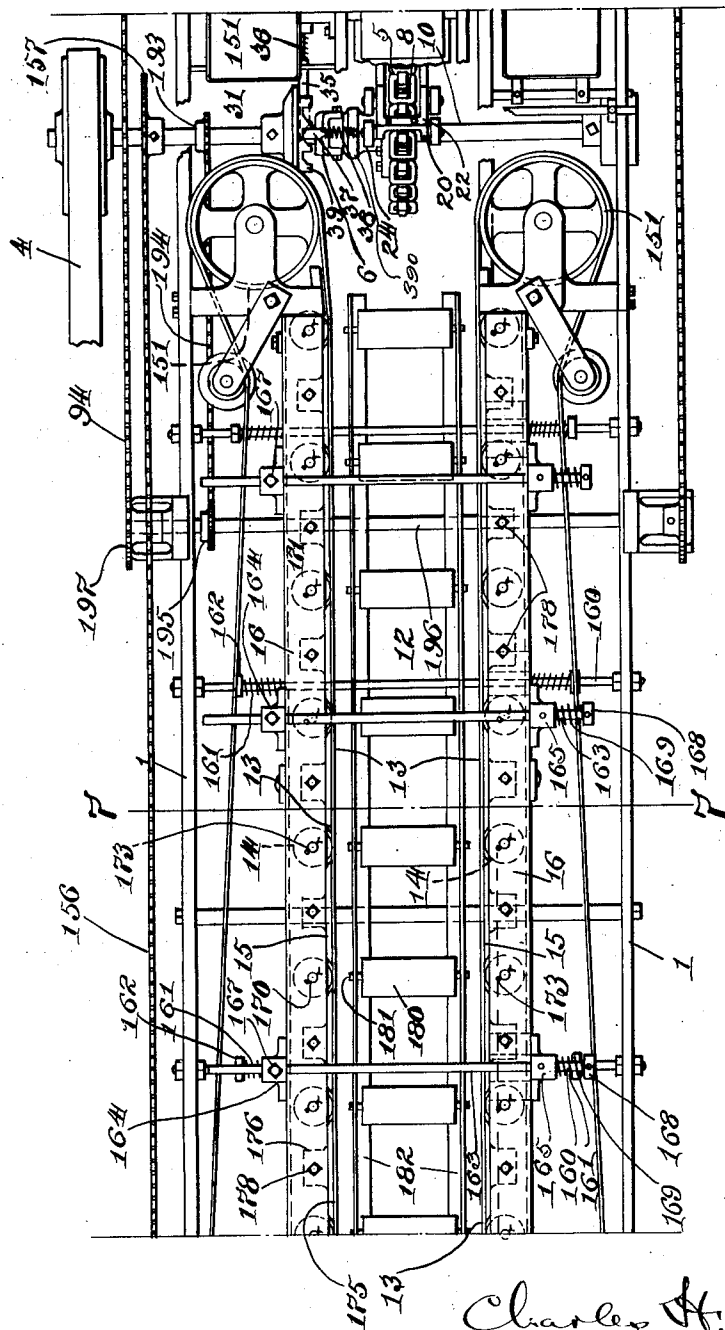
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CARTON CLOSING MACHINE

Filed Sept. 23, 1921

7 Sheets-Sheet 3



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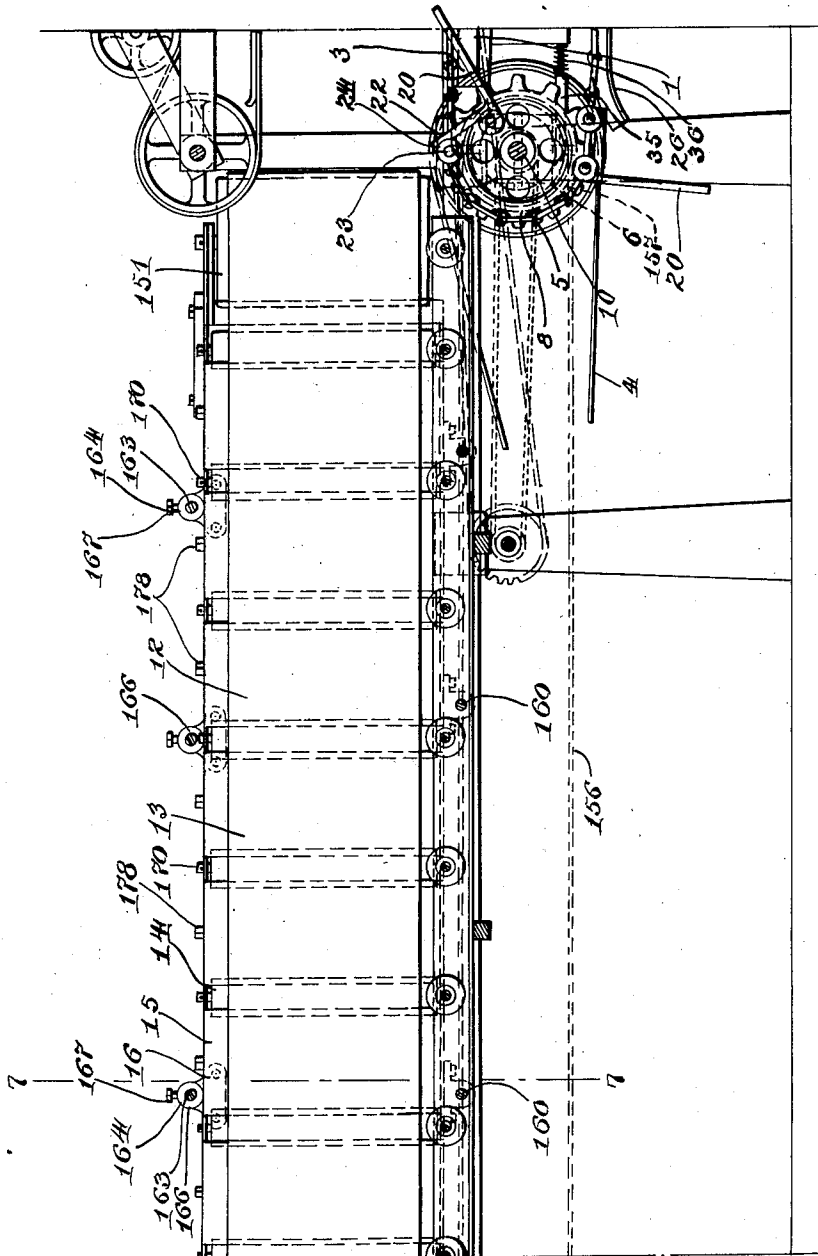
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CARTON CLOSING MACHINE

Filed Sept. 23, 1921

7 Sheets-Sheet 4



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CARTON CLOSING MACHINE

Filed Sept. 23, 1921

7 Sheets-Sheet 5

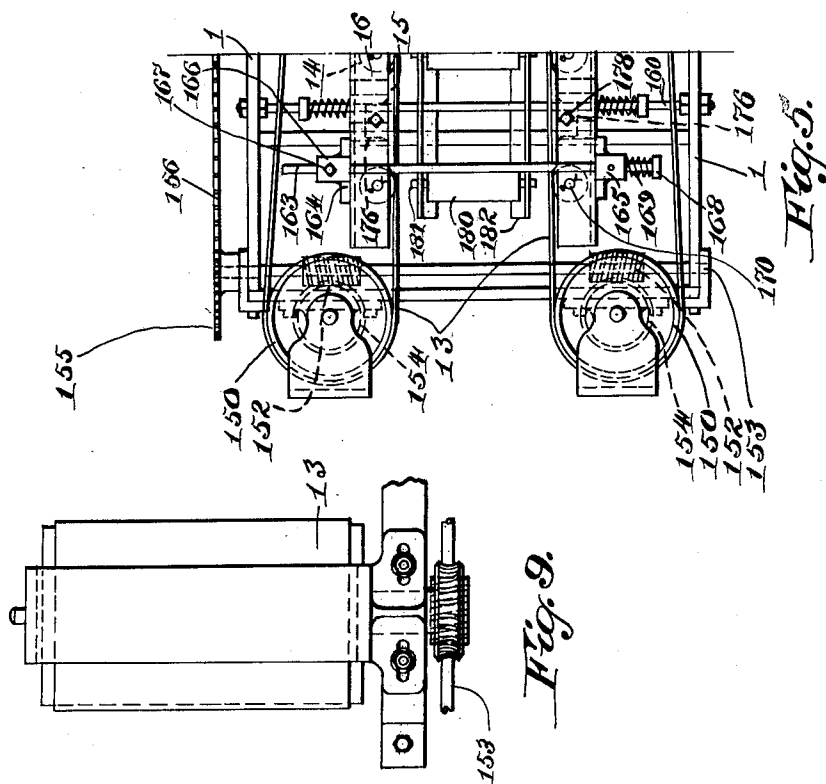


Fig. 9.

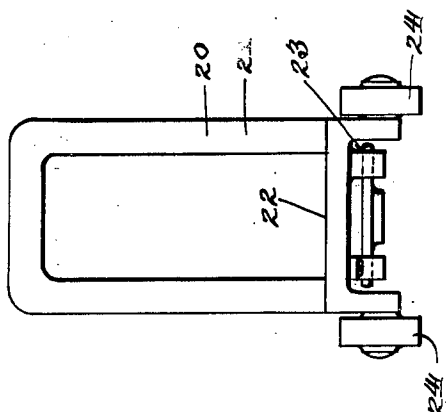


Fig. 8.

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CARTON CLOSING MACHINE

Filed Sept. 23, 1921

7 Sheets-Sheet 6

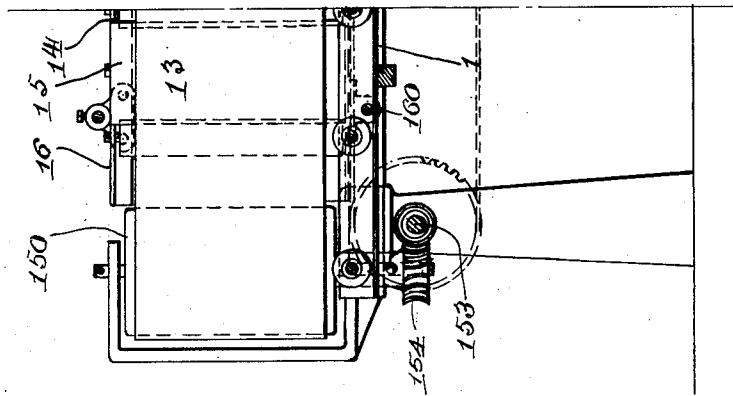


Fig. 6.

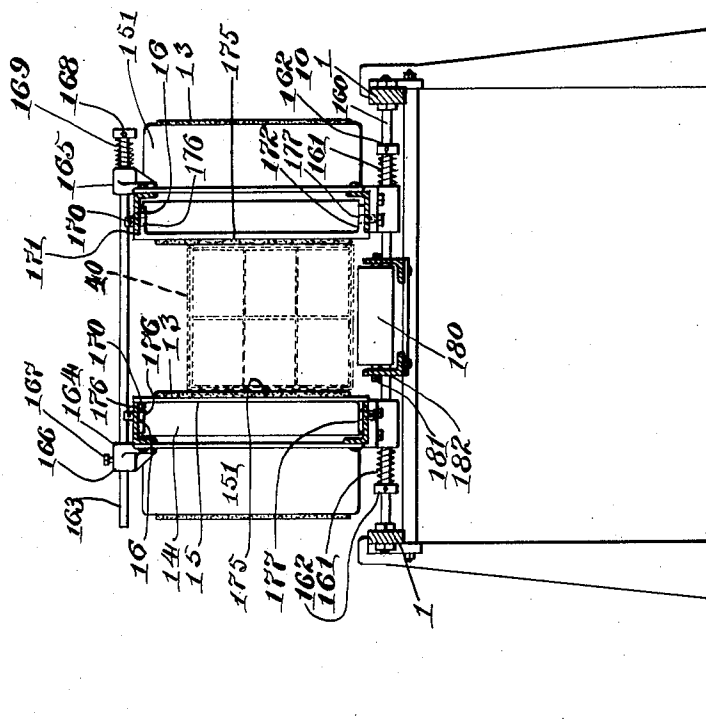


Fig. 7.

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UNITED STATES PATENT OFFICE.

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CARTON-CLOSING MACHINE.

Application filed September 23, 1921. Serial No. 502,592.

The practice of packing canned goods for shipment in paper cartons is on account of the advance in price of wooden boxes and the advantages on the side of paper boxes on account of elasticity and toughness, becoming more and more general. The chief difficulty presented is the necessity for the exercise of a considerable degree of care and skill in sealing or closing the cartons when filled and the expense thus involved on account of labor.

Machines have been devised which are more or less automatic and serve to close and seal the cartons, but these are understood to be of the single type in that they close but one end of the boxes, the other end being closed and pasted and permitted to dry before the boxes are filled and placed on the machine. The result is that the boxes which are shipped from the box factory in collapsed condition, i. e., folded flat for which purpose it is necessary for two opposite sides or ends to be left open, must be set up or assembled in order that the closed end may be pasted and dried, making it necessary that they be piled in the canning factory before they are filled. This not only requires a great deal of extra time and labor, but takes up a great deal of space in the factory for the piling of the boxes and slows down the entire operation.

An object of the present invention is to produce a machine which closes and seals both sides or ends of the boxes or cartons so that boxes received in the collapsed, flat or folded condition, are opened and filled and immediately presented to the sealing machine, the machine serving to close and seal both ends of the box or carton at a single operation, delivering a completed package.

The machine has various advantages as to its features of construction in that it may be operated continuously or intermittently, being controlled in the latter instance by the feeding of boxes to the machine which latter arrangement accomplishes a considerable saving of power where the filled cartons are not presented at a rate corresponding to the normal operation of the machine; also the machine is so arranged as to the pasting mechanism that it not only applies the paste to the flaps but rubs it and distributes it, as with a manually operated brush and the pasting mechanism, is so controlled as to apply paste or cement to only such points on

the flaps as are brought in contact with the adjacent flaps, the portions of the flaps which are exposed to the inside of the machine and to the cans being uncoated. The machine is also so arranged as to the carrier that all tendency to punch or injure the boxes is overcome and further the sealing operation is actually completed in the machine, the boxes being carried along slowly from the point of closing to the point of delivery, the flaps being pressed and held in closed position during this latter traverse to set them and complete the sealing.

In the accompanying drawings I have illustrated a machine embodying the various features of my invention in the preferred form.

In the drawings.

Figure 1 is a plan of the forward or intake end of the machine;

Figure 2 is an elevation of the same looking from the side;

Figure 3 is a plan of a portion of the machine just to the rear of and adjoining the section shown in Figures 1 and 2;

Figure 4 is a side elevation of the portion of the machine shown in Figure 3 corresponding as to point of view, &c., to Figure 2;

Figure 5 is a plan of the rear end of the machine joining the portion shown in Figure 3;

Figure 6 is a side elevation of the portion of the machine shown in plan in Figure 5 and corresponding in point of view to Figures 2 and 4;

Figure 7 is a transverse section on the line 7—7, Figure 4;

Figure 8 is a rear view of one of the carriers;

Figure 9 is a rear view of one side belt drive pulley with the bracket, worm and worm wheel;

Figure 10 is a detailed view of intermittent gearing driving the closing jaws;

Figure 11 is a fragmentary transverse section on the line 11—11 of Figure 1 showing the closing of the jaws and actuating mechanism.

Referring to the drawings by numerals, the machine as shown includes a frame 1, having ways 3, extending longitudinally thereof. Between the ways 3, is a carrier chain 5, extending longitudinally of the machine from the forward or receiving end

which is at the right in Figures 1 and 2, backward to a point which is substantially central of the machine. Having reference to side views, Figures 2 and 4, the carrier chain 5 passes over an idler or guide sprocket 7, at the front end of the machine which sprocket is at one end of the transverse of the chain and over a drive sprocket 8, substantially centrally placed in the machine and at the rear end of the traverse of the chain. The sprockets rotate contra-clockwise as seen in Figures 2 and 4. The sprocket 8 which is mounted on a transverse shaft 10, is driven by a belt 4 either direct or through suitable reducing gears. The shaft 10 is provided between the driven end thereof and the sprocket 8 with an intermittent clutch 6.

Adjacent the path of the carrier chain is the folding and pasting mechanism 11 and beyond the carrier chain in the rear is the pressing and delivery mechanism 12, the latter consisting of side belts 13, presser rollers 14 and presser plates 15 which plates and rollers are mounted in a spring presser frame 16 at each side of the path of the boxes pressing the belt inward against the boxes.

The carrier chain 5 is provided at intervals with carriers 20 which as shown are arranged in pairs, the carriers in each pair spaced about 20 inches apart to receive the boxes between them, each pair or set being about six inches apart so that the boxes on the carrier chain are in the present instance spaced about six inches apart, though these dimensions are to be determined by the conditions presented as to size of boxes, etc.

The carriers as shown are of inverted U shape in plan and elevation or more particularly of double U shape in that, having reference to the carriers when in operation there is an upright inverted U 21, and a horizontal U portion 22, the spaced ends of the U shaped members being joined to each other. The carriers are pivotally connected to the chain at their rearward ends indicated by reference character 23 in Figure 2 and are provided each with four rollers 24 which cooperate with the guide tracks 25 to hold the carriers in upright position during the operation or upper traverse as shown in Figure 2. There is also a return or bottom guide 26 to support the return traverse of the chain. The object of the double U shaped structure is made clear by the illustration, Figure 4, which object is to permit the carriers to tip forward straddling the chain at the rear end of their traverse preventing any injury to the cartons as the carriers start the downward swing around sprocket 8 and also permitting the speed of the cartons to be slowed down very considerably as they pass from the carrier chain to the pressing mechanism where on account of the slow feed and

the lack of necessity for room between the cartons to swing the flaps, etc., the space between the individual boxes or cartons is reduced from six inches to one inch or to any convenient extent. Only half the carriers need be made of the U shape, which I have described. The carrier in the rear of each carton may swing with the chain without injury to the cartons, and I have shown the alternate carriers 200 which engage the cartons from the rear, see Figure 1, as made with a slotted base 220 and bolts 221 engaging the slots and providing for adjustment of the upright member 210 relatively to the chain, to accommodate cartons of different sizes.

The carrier chain 5 is driven from the delivery end by the drive shaft 10 and the operation of the machine may at the will of the operator, be made either continuous or intermittent, in the latter instance running about 26 inches at each step or any predetermined distance corresponding to the length and spacing of the cartons so that the machine feeds forward to the extent of the length of one carton plus one space each time a carton is presented then stops to receive the next carton. The step by step feed is accomplished by means of the clutch 6 actuated by means of a feeler or finger 31 forming one arm of a bell crank lever, pivoted beneath the forward part of the ways at 32. The feeler 31 projects upward into the path of the cartons. The other arm 33 of the lever is attached to the end of a chain or other tension member 34, which extends backward toward the shaft 10, see Figures 3 and 4, the chain being connected at its rear end to a sliding dog 35 which has an inclined face at the forward end, which appears in dotted lines in Figure 3 and which is thrust rearwardly by a spiral spring 36. The dog in its rearmost position enters the path of the tail of the pawl 37, see Figure 3, carried by member 390 of the clutch 6, throwing the pawl out of engagement with the toothed member 39 releasing the clutch and holding it out of engagement. The pawl is in the form of a lever pivoted intermediately on the clutch member 390 and actuated by spring 38 engaging the tail of said lever or pawl which causes the clutch to engage i. e., engage the teeth of member 39 when the dog 35 is withdrawn, i. e. toward the forward end of the machine. The clutch remains in engagement for a full revolution of the shaft 10 whenever the pawl is withdrawn and released. The inclined surface of the dog 35 appears in dotted lines in Figure 3 beneath the clutch. The pawl lever 37 is pivoted to swing in a plane of the axis of the shaft 10, the tail of the pawl being uppermost in Figure 3. The spring 38 is also shown above the clutch member, being secured to the tail of the pawl, tending to

draw the same toward the observer in Figure 3, throwing the pawl into engagement with the teeth. The shaft 10 rotates counter-clockwise, which, when the dog 35 is in rear-most position, causes the tail of the pawl to engage the dog at each revolution, stopping the chain after each periodic operation. To start the machine the dog 35 must be drawn forward out of the path of the tail of the pawl. This withdrawal of the dog is accomplished by depressing the finger 31 rotating the bell crank lever right handed, which applies tension to the chain 34. This depression of the finger 31, may be accomplished by laying a carton 40 on the carrier, bringing the same in contact with the finger 31. If continuous operation is desired the finger 31, may be locked in depressed position by means of a hook 41, or the clutch 39 may be discarded within the scope of the invention, the machine being operated directly from the ordinary motor control or belt shaft.

Figure 1 shows a carton 40 in dotted lines, the same being understood to be filled or otherwise supported from within in distended position and having its two opposite sides or ends 42 and 43 open, the box being provided with top side flaps 44, 44, on each side and bottom side flaps 45, 45 and with front end flaps 46—46 and rear end flaps 47—47. As the box thus arranged on the carrier belt advances along the ways 3, it passes into contact with the top belt 49 which is driven from the forward end by pulley 50, belt 51 and pulley 52, on the drive sprocket shaft 68 or in any other suitable manner. The top belt is held in contact with the boxes by the adjustable belt guide and tension member 54, shown in the form of a horizontal plate carried on the frame by slotted arms 55 engaged by bolts 551.

The forward end flaps 46—46 are closed by contact of said flaps with the curved flap closing plates 56, see Figure 1, as the box advances. These plates 56 have a wedging or funnel action. The rear flaps are closed by means of swinging arms 57, mounted on upright shafts 58, at each side of the ways, swinging arms 57 being provided each with two fingers, a short forward finger 59, and a long rearward finger 60; the upright shaft 58 is driven by bevels 61—62, sprocket 63, chain 64, sprocket 65 and intermittent gearing 66—67, the latter being on the shaft 68, which carries the forward sprocket 7. The gear 66 is provided with teeth for the greater part of its periphery, the remainder of the periphery being concave at 69, the concavity being circular about the center of the gear 67. The gear 67 is in turn provided with teeth to mesh with the teeth of the gear 66, but this gear 67 is considerably larger than the gear 66, so that the teeth do not occupy the entire periphery and the remainder of

the periphery at 70 is smooth and circular, preferably the two gears have equal number of teeth. The operation of this type of intermittent gearing is believed to be well understood.

The shaft 58 rotates at intervals causing the finger 59 to first engage the rear end flap near the edge starting the operation of the inward fold or swing. The flap is then contacted by the finger 60 which completes the folding operation, turning the flaps flat and into folded position, the radius of the end of this finger causing it to swing against the flap when closed.

The upper and lower flaps 44 and 45 are next coated with adhesive which is to hold them in the folded position which they are about to take.

Having reference to Figure 2, the top and bottom flaps 44 and 45 first encounter the pasting guides 72—73 which are in the form of curved plates inclined backward in the direction of the feed from points adjacent the path of the vertical centers of the boxes, one upward and the other downward toward the respective paste applying members. These guides 72 and 73 on each side of the ways are secured at their forward ends to blocks 78 one on each side which slide for purposes of adjustment on transverse horizontal rod 75 extending across the machine. Each block is held in position on the bar by a set screw 76, permitting the guides to take any desired position by loosening the set screw and moving the block and tightening it in the desired position, it being understood that all parts are duplicated on the two sides of the machine.

In operation the guide 72 engages the top flap 44, raising it into contact with a paste roller 77, which dips in a paste pot 88. Co-operating with the roller is a series of spring fingers 79 which engage the flap from above, it being understood that the guide 72 leads the flap between the fingers 79 and the roller 77. The roller 77 is driven from a sprocket 193 on the shaft 10 which engages and actuates chain 194 which meshes with sprocket 195 driving shaft 196, carrying a sprocket 197 which drives a chain 94, which drives a sprocket 95 carried by a gear 83; the gear 83 meshes with gear 84 carrying sprocket 85 which drives chain 86 to sprocket 87, gear 88, gear 89, sprocket 90, chain 91 and sprocket 92 on the roller.

The lower guide 73 brings the bottom flap into contact with the presser plate 100 which cooperates with a paste roller 101 which latter is rotated by a chain 102 passing over a sprocket 103, carried by gear 84 and engaging a sprocket 104 on the shaft with the roller, which also carries a gear 105 which meshes with the gear 106 on a paste carrying roller 107, the latter dips in a paste pot or pan 108 and applies the paste to the roller

101. As the rollers 101 and 107 are in contact it is obvious that the latter must be moved at intervals to prevent it from applying paste to the outside of the bottom flap. It is, therefore, mounted on pivoted arms 109, to swing downward being given an upward tendency by spring 110. The foresaid plate 100 being carried on the arm 109, serves when engaged from above by a box flap 45, the bottom flaps being normally inclined at 45° to the horizontal and being bent back toward the horizontal by guides 73 until they pass between plate 73 and plate 100 (which latter is bowed like an inverted rocker, see Figure 2), depressing plate 100 and the arm 109, and the paste carrier or feed roller 107 carried by said arm, so that it does not contact with the flap when engaged from above by the paste roller 101.

It will be evident to those familiar with the art that the top flaps 44 on each side are led by the guides 72 into contact with the paste rollers 77 over which they pass being held in contact by the arms 79 and that at the same time the bottom flaps 45 are led by the guides 73 into contact with the rollers 101, being held in contact therewith by the plates 100 and that the bottom or inner face of the top flaps and the top or inner face of the bottom flaps are coated with paste and preferably the paste rollers are given a certain speed different from and which may be faster than the speed of the flaps causing the rollers to rub the paste on to the surfaces of the flaps very much as if it were brushed on by hand. It will further be understood that the end flaps 46 and 47 are closed first, i. e., before the top and bottom flaps 44 and 45 so that the paste coated surfaces of the latter engage the outer surfaces of the end flaps 46 and 47, the operation of closing being completed by pressing the flaps into closed position as herein-after described.

As the end flaps of the standard cartons do not meet at the center, it is necessary to prevent the paste from being applied to the top and bottom flaps at the center, otherwise some of the cans would be smeared with the paste which would appear inside the carton. This is accomplished by moving the upper paste rollers downward and the lower paste rollers upward, and both of them back to their original positions at a point intermediate the pasting operation. In the machine shown this is accomplished by mounting the lower paste roller 101 on a swinging arm 112, pivoted intermediately at 113 on the machine frame and mounting the upper roller 77 on an arm 114, pivoted at its rear end 115. These two arms 112 and 114 are then connected by a link 116 which engages the lower arm at a point at the rear of its pivot and the upper arm at a point forward of

its pivotal point so that as the lower roller swings upward the upper roller will swing downward, both moving their rollers out of engagement. To produce this intermittent action the lower arm 112 is provided with a cam follower 117 engaging a cam 118 on the shaft 80, which has a suitable dip or depression to provide for the desired instantaneous motion, the said shaft being driven by a sprocket 81 engaging chain 5 for this purpose.

As the paste coating operation is completed the top and bottom flaps are folded into closed position. This is accomplished by means of closing arms 120—121, arranged above and below the path of the upper and lower flaps and mounted on parallel shafts 122 and 123, respectively, which are caused to operate in unison by intermeshing toothed segments 124—125. The lower shaft 123 has a projecting arm 126 which is engaged at its outer end by connecting rod 127, the engagement being preferably in the form of a ball and socket joint 128, which arm extends downward to the vicinity of the shaft 80, carrying at its lower end a cam follower 129 which engages a cam 131 mounted on the shaft 80. The cam is intended and designed and the parts are arranged in proportion to cause the arms to swing toward each other in a vertical plane as each box or carton passes engaging the upper and lower flaps from above and below respectively, swinging them together and closing them, when as the box passes, the arms are again thrown apart to receive the next box. The arms may be in two parts adjustable by means of slotted connections 130 to change their length.

Referring now to the rear section of the machine illustrated in Figures 3, 4, 5 and 6.

Figures 3 and 4 constitute a plan and a side view respectively of a portion of the machine adjoining that shown in Figures 1 and 2 and extending backward or substantially to the rear end of the machine which is shown in plan in Figure 5 and in side elevation in Figure 6, Figure 7 being a transverse section.

The boxes are released from the rear end of the carrier chain as shown by the operation of the carrier as illustrated at the right in Figure 4, i. e., the carriers 20, which have been running backward along the guide track 25, reaching the end of the track are released and swing forward, i. e., rotate to the right about the axis of the rear pivot pin 23, straddling the chain and releasing the box. The operation thus described has particular reference to the carrier in the rear of each individual box, for the forward carrier being held by the box swings forward and downward as the chain passes around the sprocket. The U construction of the carriers whereby the straddling of the chain

and sprockets is provided for, has been described.

The boxes as they come from the carrier are received by the pressing mechanism 5 composed of the presser frames 16, carrying the presser rollers 14 and presser plates 15 controlling the presser belts 13. The latter, i. e., the presser belts 13 are actuated by and carried on drive pulleys 150 at the extreme rear end of the machine and run over idler pulleys 151 at the forward end of the belt traverse and adjacent the rear end of the carrier chain. The pulleys have their axes vertically arranged and the belts which 10 are also in vertical planes are parallel and spaced apart as to their adjacent surfaces by a distance corresponding to the width or height of the boxes. The drive pulleys 150 are driven by worms 152 on a transverse 20 shaft 153 at the rear, which worms engage worm wheels 154 carried by the shafts of pulleys 150. The transverse shaft 153 is in turn driven by the sprocket 155 and chain 156 which passes over and is driven by a 25 sprocket 157 on the main shaft between the drive pulley and the clutch so that the operation of the belts is continuous. The speed of the belts as foresaid is preferably considerably less than the speed of the carrier chain so that the pressing operation during which the parted flaps are pressed and set is prolonged and the efficiency of the pressing operation is greatly increased. The pressing belts are guided and held in 35 close contact with the boxes as foresaid by means of the pressing frames 16 and the rollers and plates 14 and 13 carried thereby. These frames 16 are mounted on transverse rods 160, the same being horizontal and placed at intervals along the machine bed 40 so that they are in the present instance 4 in number.

The respective presser frames 16 are mounted to slide on these rods, both of the 45 frames being urged inwardly each toward the other by springs 161, coiled about the rods and abutting against collars 162, secured to the rods. Springs at the opposite ends of the rods bear against the respective presser frames. The frames are guided at 50 their upper sides by transverse rods 163 which engage lugs 164—165 on the respective frames, the lug 164 being provided with a collar and set screw 166—167 to hold the 55 rod and the lug 165 being in the nature of a slide bearing through which the rod passes. The end of the rod at the outside of the frame having a collar 168 secured to the rod and a coil spring 169 being wrapped around the rod between the lug 165 and the collar 168 so that the spring and collar and rod not only serve to guide the presser frames but to draw them together. The rollers 14 60 aforesaid are mounted in the presser frames 16 at intervals, having their pins or axles

170 mounted to rotate freely in suitable holes or openings in the top and bottom plates 171—172 of the presser frames, the pins or axles 170 being held by cotters 173 or other suitable means.

The presser plates 15 particularly as to their pressing surfaces 175, which are disposed toward the belt, are in the plane of the corresponding tangent or lines of contact with the belt of the rollers 14, extending 75 substantially from one contact line to the other, there being one such plate between each pair of rollers. Each plate in the form of the invention shown is rigidly supported on the frame having a lug 176 at the top 80 and 177 at the bottom, secured to the top and bottom plates of the frame by means of cap screw 178 or in any suitable manner.

The rollers may preferably protrude very slightly beyond the plates so as to take up the friction. It is apparent that the rollers and plates form a continuous support for the belt and by means of the yielding support afforded to the frame as described, the rollers and presser plates press the belt 90 uniformly against the closed ends of the cartons and the motion of the belt serves to move the cartons at the desired rate through the machine, the pressure of the belts which it will be noted engage the folded flaps, 95 serving to complete the closure and press the flaps into fixed position and at the same time permitting the adhesive to set.

The cartons, if by any chance they settle or slide down from the grip of the belts are 100 supported from beneath by rollers 180 mounted on transverse axes and in a horizontal plane near the bottom edge of the belts arranged along the traverse between the belts and spaced apart by distances less 105 than the length of the cartons. These rollers are carried by axial pins 181 which are journaled in the longitudinal parallel angles 182, supported on the frame of the machine or in any suitable manner. 110

Throughout the description I have referred to the end of the machine where the operator stands or where the cartons are placed on the carrier as the front of the machine and to the feed of the cartons through 115 the machine as from front to rear so that the operative motion of the carrier and delivery belts is from front to rear and therefore rearward or backward.

I have thus described specifically and in 120 detail a single embodiment of my invention so that the nature and operation of same may be clearly understood. However, the specific terms herein are used descriptively rather than in a limiting sense, the scope of 125 the invention being defined in the claims.

What I claim and desire to secure by Letters Patent is:

1. In a machine for closing cartons having end flaps, a carrier for the cartons and 130

means adjacent the carrier for applying paste to the flaps consisting of paste rollers and means for rotating the rollers at a speed greater than the speed of the carrier so that the rollers have a rubbing action in applying the paste and means for folding the flaps.

2. In a machine for closing cartons having cover or closing flaps, a carrier for the cartons, flap closing means adjacent the carrier, and paste rollers adjacent the carrier for coating the flaps as the cartons pass, means for rotating the rollers and means for swinging the rollers at intervals during the passage of each carton causing them to skip a portion of the flap, said means including a cam and a follower, pivoted arms carrying the rollers, means for communicating the motion of the follower to said arms including a connection between the arms on opposite sides of the pivots causing the rollers to swing simultaneously and oppositely.

3. In a machine for closing paper cartons having cover flaps arranged in pairs of opposite flaps, a carrier for the cartons, a plurality of paste applying rollers adjacent the paths of the two opposite flaps, pivoted arms, one carrying each said roller, a rod connecting said arms, said connection being on opposite sides of the pivots of the respective arms and means for swinging said arms as each carton passes the foresaid connection causing them to swing oppositely and simultaneously so that each roller misses a portion of the flap which it engages and flap closing means adjacent the carrier.

4. In a machine for closing rectangular cartons having closing flaps oppositely arranged in pairs and on opposite open sides or ends of the carton, a carrier for the cartons, means at the side of the path of the cartons while on the carrier for coating the inner surfaces of one such pair of flaps with paste, means also adjacent the path of the cartons and forward of said paste coating means for closing the other pair of flaps and means in the rear of said coating means and adjacent the carrier for closing said paste coated flaps, said coating, folding and closing means being duplicated on the opposite sides of the carrier so that the machine serves to close both sides or ends of the cartons at a single operation.

5. In a machine for closing rectangular cartons having closing flaps oppositely arranged in pairs and on opposite open sides or ends of the carton, a carrier for the cartons, means adjacent the path of the cartons while on the carrier for coating the inner surfaces of one such pair of flaps with paste, means also adjacent the path of the cartons and forward of said paste coating means for closing the other pair of flaps and means in the rear of said coating means and adjacent the carrier for closing said paste coated

flaps, said coating, folding and closing means being duplicated on the opposite sides of the carrier so that the machine serves to close both sides or ends of the cartons at a single operation, and pressing means beyond the closing means.

6. In a machine for closing rectangular cartons having closing flaps at right angles to each other, a carrier for advancing the cartons with their open ends turned laterally causing the hinges of said flaps to lie in a horizontal plane and move in the direction of their length, coating means for said flaps including a paste pot, a paste feeding roller, a paste applying roller in contact with said feeding roller, means for rotating said rollers, means for guiding the flap into contact with the applying roller as the carton passes and means for deflecting the feeding roller to avoid contact of said roller with the outside of the flap consisting of a yielding member on which the feed roller is mounted, means tending to move said member to hold the feed roller in feeding position and a presser for deflecting the feed roller, the presser being mounted on said member and extending across the path of the flap adjacent the paste applying roller so that it is depressed by the flap as it comes in contact with the paste applying roller and forced out of the path of the flap deflecting the feed roller, the same being released and permitted to return to normal position when the flap passes and flap closing means adjacent the carrier.

7. In a machine for closing cartons, a paste applying roller, a paste feeding roller therefor, a carrier passing adjacent said rollers so that the flaps are moved in contact with the paste applying roller, a pivoted lever arm carrying the feed roller, a foot also connected to the feed roller and projecting into the path of the carton flaps and yielding means tending to maintain the feed roller in contact with the paste roller so that the carton flap when it engages the said foot as it comes in contact with the pasting roller depresses the foot and the feed roller preventing contact of the latter with the flap and flap closing means adjacent the carrier.

8. In a machine for closing cartons, a carrier chain for the cartons, paste coating and carton flap folding means adjacent the carrier chain, delivery means beyond the carrier chain and carrier arms on the chain for engaging the cartons, the same being of double U shape, the U's being joined at the ends of the arms and placed at right angles to each other and pivotally connected to the chain near the cross arm of one U, followers on each arm adjacent the meeting point of the two U shaped members, sprockets carrying and driving the chain, a guide

for the arms engaged by the followers and terminating forward of the rear sprocket so as to permit the carriers to swing forward and downward straddling the chain and releasing the cartons at the end of the traverse and preventing the rearward thrust of the arm at the end of the traverse which would tend to puncture the carton.

9. In a machine for closing cartons, a carrier chain, flap closing and pasting mechanism at the side of the chain, sprockets for the chain, carrier arms on the chain consisting of a foot and an upright arm, the foot being pivoted on the chain to swing forward from its normal position thereon, a stop limiting the swing, the feed being backward, followers mounted on the arm foot, a guide engaging said followers, the guide terminating forward of the rear sprocket so that the carriers are released at this point and permitted to swing downward and forward instead of turning downward and backward about the rear sprocket and pressing and delivery means immediately beyond the carrier.

10. In a carton closing machine, a carrier chain, flap closing and pasting mechanism at the side of the chain, sprockets for driving and guiding the chain, carrier arms on the chain having a foot portion and an upright portion, pivoted means connecting one end of the foot portion to the chain so it can swing relative to the chain, a stop to limit the swing, followers on the foot portion, a guide track for the followers, means for rotating one sprocket, driving the top side of the chain from front to rear, the guide terminating forward of the rear sprocket permitting the carrier arms to swing downward and forward as they circle the rear sprocket.

11. In a machine for closing cartons, a carrier chain, sprockets therefor, means for driving one sprocket and moving the top side of the chain from front to rear, carrier arms having an upright portion and a foot portion, the rear end of the foot portion being pivotally connected to the chain, followers on the foot portion, a guide beneath the top half of the chain, the same being discontinued over the rear sprocket the carrier arms and feet having an aperture permitting the portion forward of the pivot to straddle the chain so that as the followers pass the carrier and start to circle the rear sprocket, the arms swing downward and forward straddling the chain, and delivery mechanism immediately in the rear of the chain receiving the cartons from the chain and means for driving the same at a slower rate than the speed of the carrier chain, and flap closing means adjacent the carrier.

12. In a machine for closing cartons, an endless carrier, carton flap closing and pasting mechanism at the sides of the carrier,

sprockets for driving and guiding the carrier, arms mounted thereon to swing relatively thereto, means limiting their swing, each arm having followers spaced apart in the direction of the length of the carrier, a guide track beneath the upper traverse of the carrier terminating forward of the center of the rear sprocket, delivery and presser mechanism to the rearward of the carrier adapted to receive the cartons immediately therefrom.

13. In a machine for closing cartons, an endless carrier for the cartons, folding and pasting mechanism adjacent the path of the cartons on the carrier, means for driving the carrier, an intermittent clutch included in said driving means, a feeler in the path of the cartons to be actuated by each carton as it passes and means connecting the said feeler to the clutch so that the clutch is caused to engage when the carton comes in contact with the finger, the machine being operated step by step as each carton is placed on the machine.

14. In a machine for closing cartons, an endless carrier for the cartons, folding and pasting mechanism adjacent the path of the cartons on the carrier, means for driving the carrier, an intermittent clutch included in said driving means, said clutch including a toothed member, a pawl for engaging the teeth, a spring tending to throw the pawl into engagement, a sliding dog to engage and release the pawl, a spring tending to move the dog into the path of the pawl, a feeler in the form of a belt crank lever pivoted beneath the carrier and means connecting said belt crank lever to said dog.

15. In a machine for closing rectangular cartons having flaps on the opposite sides, a carrier for the cartons, paste applying means, and means for closing the top and bottom flaps also adjacent the carrier, said latter means consisting of a plurality of arms mounted to swing in a vertical plane, means for swinging said arms toward and from each other causing them to approach as the cartons pass, engaging the flaps from above and below and swinging them into closed position.

16. In a machine for closing cartons having closing flaps, a carrier for the cartons, and means for folding the top and bottom flaps, all said means being adjacent the carrier and the latter consisting of a plurality of arms mounted to swing toward each other substantially in a vertical direction and means comprising a plurality of meshing toothed segments for actuating the same for oscillating said arms, causing them to swing together as each carton passes, the arms having their swinging ends when opened one above and the other below the path of the respective top and bottom flaps.

17. In a machine for closing cartons hav-

ing the opposite ends open with pairs of closing flaps at each end at right angles to each other, the cartons being placed on the carrier with their open ends disposed laterally and the pairs of flaps at the top and bottom and the front and rear, respectively, means adjacent the path of the carrier for closing the forward flap, means in the form of a swinging arm adjacent the path of the carrier for closing the rear flap, and means in the form of swinging arms for closing the top and bottom flaps, means for swinging said arms causing them to close or move toward each other as the cartons pass the swinging ends of said arms, being, when the arms are open, above and below the paths of the upper and lower flaps respectively.

18. In a machine for closing cartons having oppositely disposed end flaps, a carrier for the cartons adapted to receive the cartons with their open ends laterally disposed so that the flaps are placed at the forward and rear sides of the cartons, means for closing the flaps including a swinging arm adjacent the path of the carrier adapted to close the rear flap, means for swinging said arm at intervals substantially in a horizontal plane moving it forward in the direction of the carrier at a speed greater than the speed of the carrier, same consisting of an intermittent gearing and upright shaft on which the arm is mounted.

19. In a machine for closing cartons having oppositely disposed end flaps, a carrier for the cartons adapted to receive the cartons, means for closing the flaps including a swinging arm adjacent the path of the carrier adapted to close the rear flap, means for swinging said arm at intervals substantially moving it forward in the direction of the carrier at a speed greater than the speed of the carrier, same consisting of an intermittent gearing and a shaft on which the arm is mounted, the arm having fingers at different radii adapted to engage the swinging edge and base portion of the flap respectively.

20. In a machine for closing cartons having oppositely disposed end flaps, a carrier for the cartons, means for closing the flaps including a swinging arm adjacent the path of the carrier adapted to close the rear flap, means for swinging said arm at intervals moving it forward in the direction of the carrier at a speed greater than the speed of the carrier, the swinging arm having fingers at different radii, the short radius finger engaging the swinging edge of the flap in the first part of the closing operation and the long radius finger engaging the base portion

of the flap at the latter part of the closing operation.

21. In a machine for closing rectangular cartons having their opposite ends open and provided with closing flaps arranged in pairs of opposite flaps at right angles to each other at each end, a carrier adapted to receive the cartons with their open ends laterally disposed so that the flaps project at the opposite sides of the carrier, means adjacent the path of the carrier and at each side of the path of the carrier for folding one set of flaps, means adjacent the path of the carrier at each side for coating the other set of flaps with paste, means adjacent the path of the carrier at each side for folding the paste coated flaps.

22. In a machine for closing rectangular cartons having their opposite ends open and provided with closing flaps arranged in pairs of opposite flaps at right angles to each other at each end, a carrier adapted to receive the cartons with their open ends laterally disposed so that the flaps project at the opposite sides of the carrier, means adjacent the path of the carrier and at each side of the path of the carrier for folding one set of flaps, means adjacent the path of the carrier at each side for coating the other set of flaps with paste, means adjacent the path of the carrier at each side for folding the paste coated flaps and pressing means beyond the coating and folding means spaced apart and oppositely disposed to engage the cartons from opposite sides and press the folded flaps in folded position.

23. In a machine for closing rectangular cartons having their opposite ends open and provided with closing flaps arranged in pairs of opposite flaps at right angles to each other at each end, a carrier adapted to receive the cartons with their open ends laterally disposed so that the flaps project at the opposite sides of the carrier, means adjacent the path of the carrier and at each side of the path of the carrier for folding one set of flaps, means adjacent the path of the carrier at each side for coating the other set of flaps with paste, means adjacent the path of the carrier at each side for folding the paste coated flaps and delivery mechanism including a plurality of belts and means for pressing said belts against the opposite faces of the cartons and means for driving said belts to effect the delivery of the cartons.

Signed by me at Baltimore, Maryland, this 16th day of September, 1921.

CHARLES H. WILD.