July 27, 1937. H. L. EVANS 2,088,192

CARTON CLOSING MEANS

Filed April 21, 1936 5 Sheets-Sheet 1

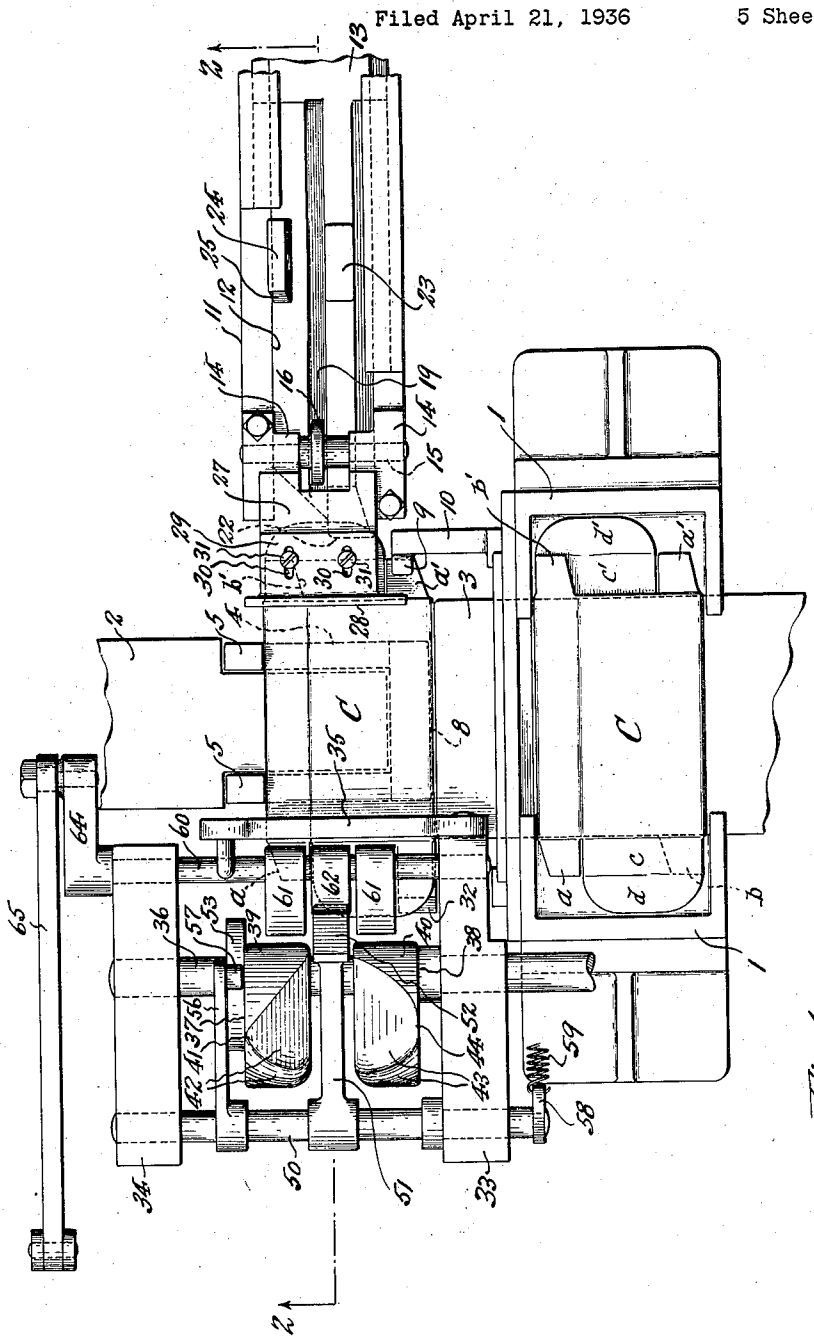


Fig. 1

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CARTON CLOSING MEANS

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Fig. 3

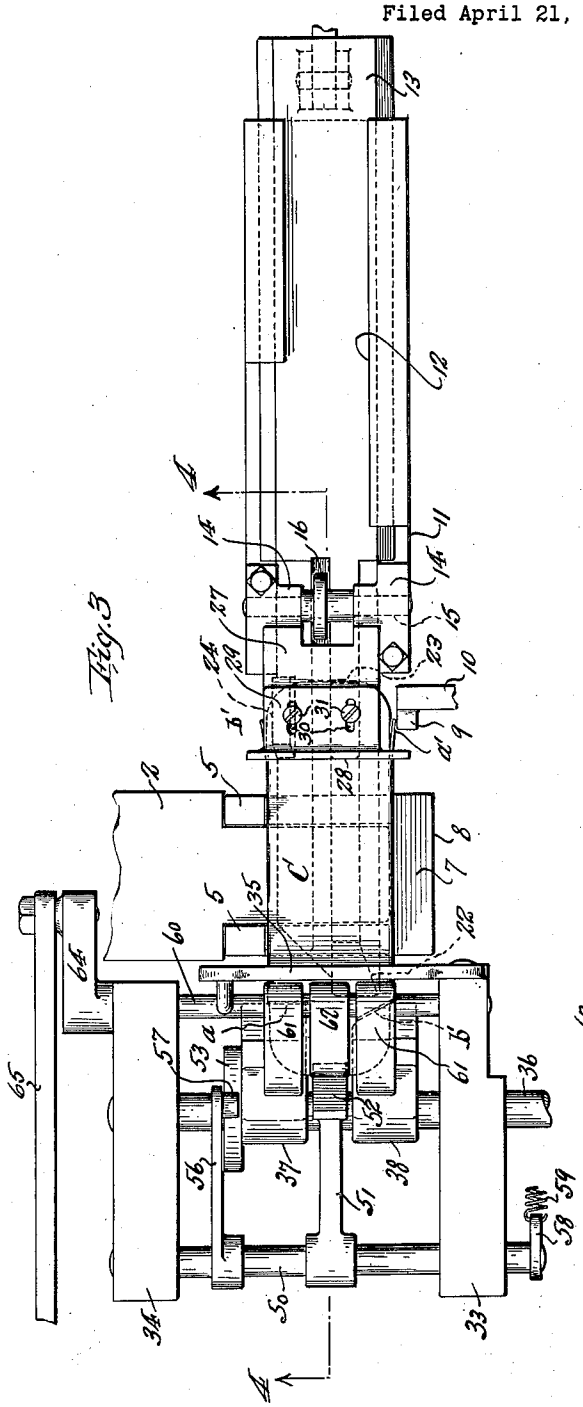
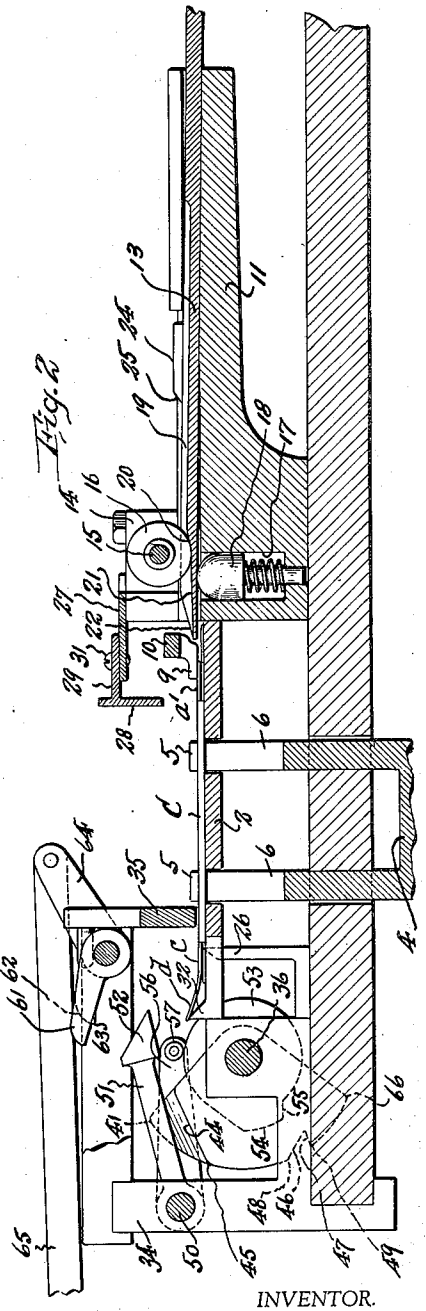


Fig. 2



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CARTON CLOSING MEANS

Filed April 21, 1936 5 Sheets-Sheet 3

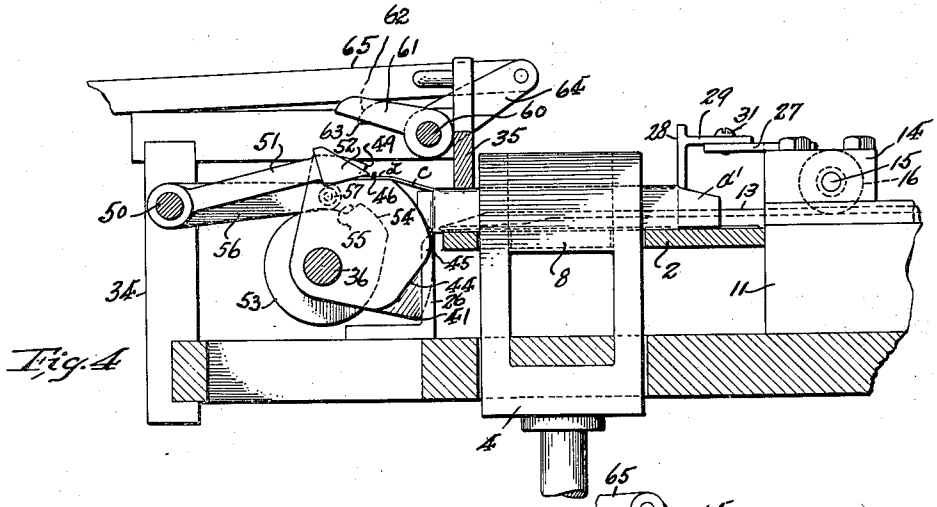


Fig. 4

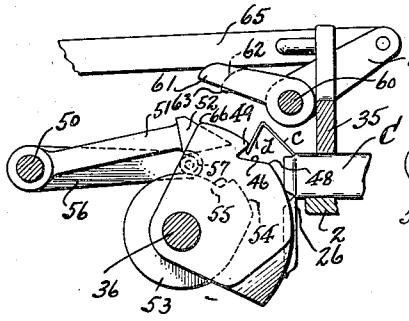


Fig. 5

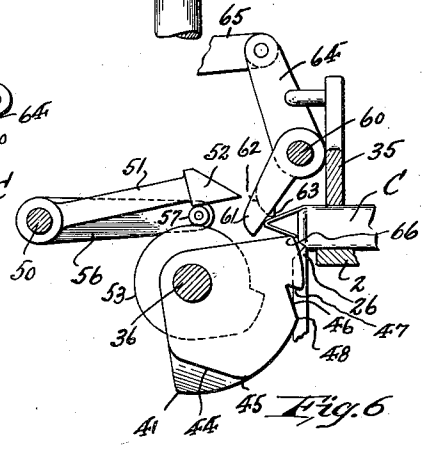


Fig. 6

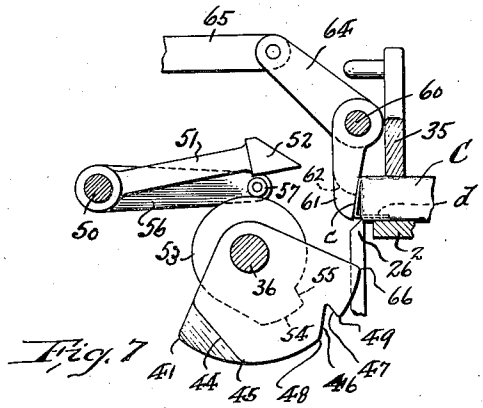


Fig. 7

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CARTON CLOSING MEANS

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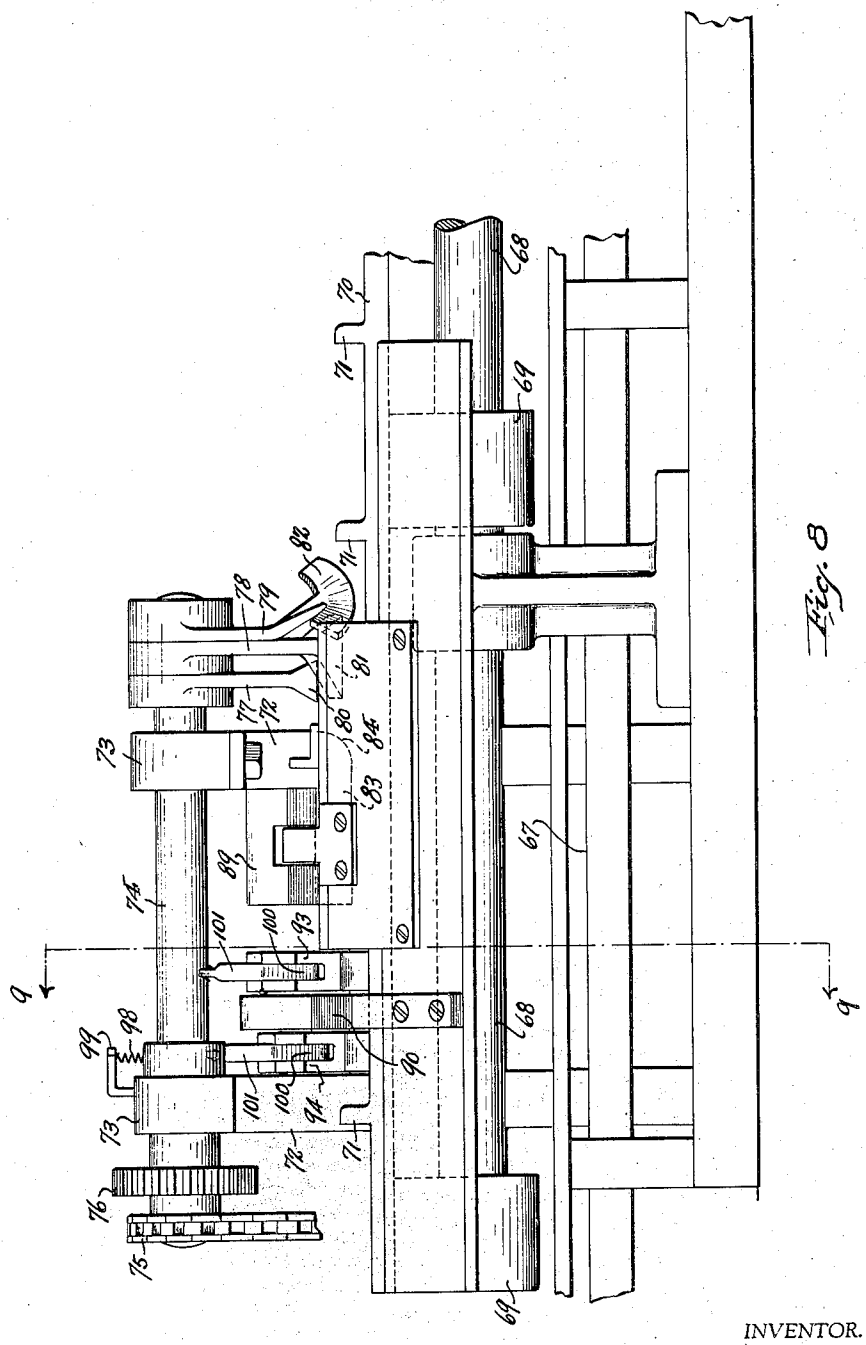


Fig. 8

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CARTON CLOSING MEANS

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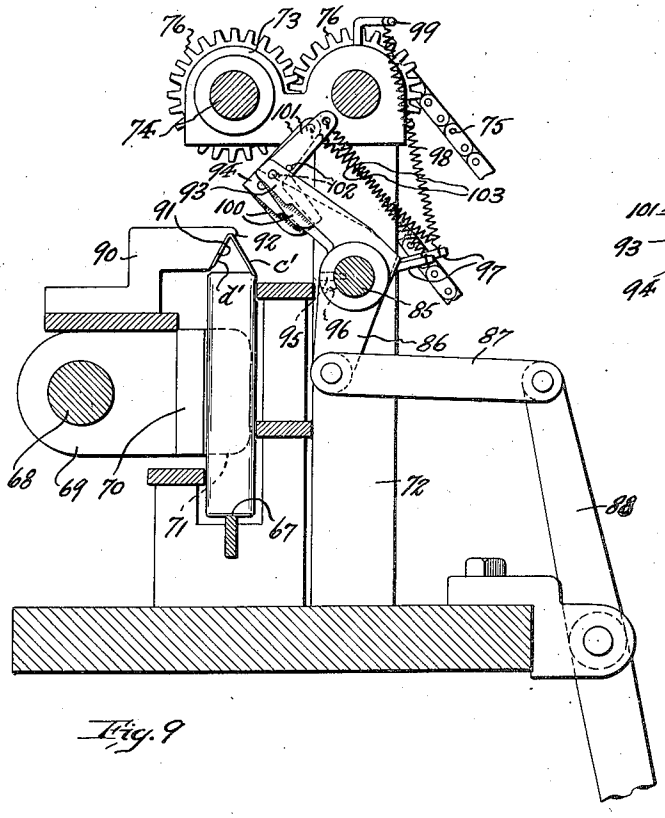


Fig. 9

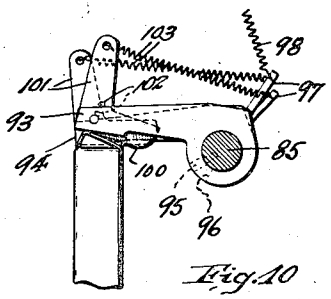


Fig. 10

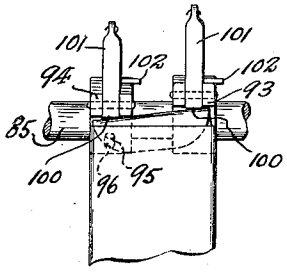


Fig. 11

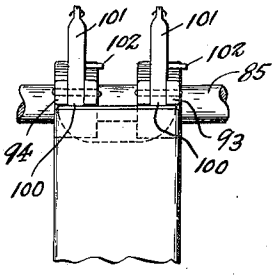


Fig. 12

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Patented July 27, 1937 2,088,192

UNITED STATES PATENT OFFICE

2,088,192

CARTON CLOSING MEANS

Harry L. Evans, Newport, R. I., assignor to Cartoning Machinery Corporation, Newport, R. I., a corporation of New Jersey

Application April 21, 1936, Serial No. 75,527

9 Claims. (Cl. 93—6)

This invention relates to improved means for setting up cartons and closing the ends thereof adapted for use in automatic carton filling machines, such e. g. as shown in U. S. Letters Patent No. 1,622,709, dated March 29, 1927.

This invention has for its principal object to provide improved means for setting up or squaring cartons, initially supplied to the machine in flat or collapsed condition, and thereafter closing the side flaps and tuck end closures thereof; and the invention seeks to provide means for such purposes which attain more perfect control over the carton during the stated operations, and which are more positive in action, so that risk of accidental spoilage of cartons, with consequent interruption of the operation of the machine as a whole, is reduced to a minimum; while at the same time the manipulation of the closure flaps and tuck end portions of the cartons is so carried on as to "break" the elasticity of the folds or defining scores thereof, whereby, when finally moved to closed position, the same have no tendency to outward reactive displacement or loosening from their fully and properly closed conditions.

Other objects of this invention, not at this time more particularly enumerated, will be clearly understood from the following detailed description of the same.

The invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a plan view of means for setting up the carton and for closing the side flaps and tuck end closure at one end thereof; Fig. 2 is a longitudinal section, taken on line 2—2 in Fig. 1; Fig. 3 is a plan view somewhat similar to that of Fig. 1 but showing the operation of setting up or opening the carton from the flat; Fig. 4 is a longitudinal section, taken on line 4—4 in Fig. 3; Figs. 5, 6 and 7 are fragmentary longitudinal sectional views, respectively showing various steps in the operations of closing one end of the carton.

Fig. 8 is a front elevation of means for closing the side flaps and tuck end closure at the other or opposite end of the carton; Fig. 9 is a transverse vertical section, taken on line 9—9 in Fig. 8; Fig. 10 is a similar fragmentary view showing the final operations effective to close the tuck end closure; and Figs. 11 and 12 are fragmentary detail front elevations, showing steps in the final operations effective to close the tuck end closure of the carton.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

In the drawings the collapsed or flat cartons C are stacked in a supply magazine 1, from which the same are ejected to and upon runway 2 by a reciprocated push-plate 3. Cooperative with runway 2 is a squaring elevator 4 which is vertically reciprocated, by suitable actuating means (not shown), in timed relation to the delivery of the cartons. When in initial downwardly retracted position, the upper extremities 5 of the forward stop arms 6 of said squaring elevator project somewhat above the surface of said runway 2, while the chamfered extremity 7 of the rearward lift arm 8 thereof is withdrawn below the surface of said runway 2. The space intermediate said stop arms 6 and lift arm 8 is approximately equal to the width of an expanded or squared carton. When a flat or collapsed carton is pushed outwardly from the magazine 1, it is carried forwardly onto the runway 2 until it abuts the extremities 5 of the stop arms 6, whereby the downwardly facing side portion of the collapsed carton overhangs the chamfered extremity 7 of the lift arm 8 (see Fig. 1). When a carton is thus delivered ready for a squaring or expanding operation, the side flap *a'*, which projects from the downwardly facing side of carton C at the inward end thereof, will underlie a fixed breaker tongue 9 which is supported by an arm 10 secured to and projecting from the magazine 1.

Arranged in longitudinal alignment relative to the described delivered position of the flat or collapsed carton C, and opposed to the inward end thereof, is a guide bracket 11, provided with guideway means 12 guiding the longitudinally reciprocating timed movements of a clamp blade 13. Said clamp blade 13 is supported by said guide bracket and its guiding means so as to be capable of limited vertical oscillation or play. Affixed to the forward end of said guide bracket, at the sides thereof, are bearing portions 14 in and between which is mounted a transverse axle shaft 15, upon which is mounted a clamp blade depressor roller 16. Movable in a vertical bore 17 with which the body of said guide bracket is provided, is a spring pressed push-piece 18, the body of which is preferably made of lignum vitae, being thus strongly resistant to wear and offering a minimum frictional resistance to operative movements of the clamp-blade. Said push-piece 18 operates to yieldably thrust the clamp-blade 13 upwardly against the depressor roller 16. Clamp blade 13 is provided in its up-

per surface with a longitudinally channeled way 19 cooperative with said depressor roller 16. At its forward end, said way 19 is provided with a descending inclined camming plane 20, leading to a depressed portion 21 thereof adjacent to the free forward end of the clamp blade. When the clamp blade is retracted to normal initial position, said depressed portion 21 of way 19 underlies depressor roller 16, so that push-piece 18 uplifts the forward end or chamfered nosing 22 of said clamp-blade 13 to space the same above the level of runway 2. By reason of such spaced relation to runway 2 of the free end or nosing of clamp-blade 13, when a flat carton C is delivered onto said runway, and into stopped relation to said squaring elevator, the tuck end *d'* of end closure member *c'* at the inner end of carton C will pass beneath the uplifted chamfered extremity or nosing 22 of clamp-blade 13 (see Fig. 2). Fixed upon the upper surface of clamp-blade 13, in a proper position rearwardly spaced from its free end, is a centering block 23. Also fixed upon the upper surface of clamp-blade 13, in a proper position rearwardly spaced from its free end, is a side flap breaker block 24, which has a chamfered or inclined forward end 25, the same being operative upon carton side flap *b'*, as the operative stroke of said clamp-blade occurs.

Immediately after a collapsed carton C is delivered onto runway 2 and in register with the squaring elevator, timed operating means (not shown) functions to advance clamp blade 13. In thus advancing, the camming plane 20 moves beneath the depressor roller 16, whereby the forward free end of clamp blade 13 is forced downwardly flatly upon the underlying portions of the carton body, whereupon, as the clamp blade further advances, the same will enter between the face walls of the carton. As clamp blade 13 approaches the end of its operative stroke, the forward end of centering block 23 engages the end margin of the overlying face wall of the carton, and thereafter, as the clamp blade completes its stroke the carton is pushed endwise against a fixed stop 26, which engages the end margin of the underlying face wall thereof, thus centering the carton relative to the squaring elevator, and disposing the tuck end *d* of end closure member *c* and side flaps *a* and *b*, all at the forward end of the carton, in proper positions relative to the mechanism which is subsequently operative to close these parts.

The clamp blade 13 having entered the carton interior operates to firmly clamp or hold the underlying face wall thereof flatly and immovably upon the runway 2, and thus secures the same subject to the operation of the squaring elevator. These operations having been effected, timed operating means (not shown) functions to move upwardly said squaring elevator, thereby thrusting the lift arm 8 upwardly against the downwardly facing side portion of the collapsed carton thereby swinging upwardly the side portions and overlying face wall of the carton body to "squared" or expanded condition. Supported from the bearing portions 14 which are mounted on the guide bracket, preferably by means of a forwardly projecting bracket plate 27 which is affixed to the bearing portions 14, is a vertically disposed transverse stop-plate 28 having a tail-piece 29 which is adjustably connected with said bracket plate 27, as by the slots 30 and screws 31, so that said stop-plate 28 may be adjusted to an operative position accommodating the particular size of carton operated upon. When the squaring elevator expands the carton C from its flat or collapsed condition, the raising of the overlying face wall carries its rearward end margin into abutting relation to the outer face of said stop-plate 28, so that the expanded carton body is thus held against endwise displacement between said stop-plate 28 and said fixed stop 26, and thus also immovable when the clamp blade 13 is retracted to normal initial position, and thereby withdrawn from the carton interior, which operation is timed to occur during the closing of the forward end of the carton.

As the carton is advanced against stop 26 by the entering clamp blade 13, the tuck end *d* of its end closure member *c* is caused to ride upwardly on a fixed breaker arm 32 which bends back said tuck end *d* along the score line between the same and closure member *c*, thus taking the "spring" out of the joint provided at said score line, so that when the forward end of the carton is closed tendency to outward displacement of said tuck end *d* is eliminated.

Located adjacent to the outer side of said runway 2, are upstanding spaced apart bearing frames 33 and 34. Pivotally connected with bearing frame 33 is a more or less weighty keeper member 35, which extends transversely across the forward end of the raised or expanded carton C, being held in engagement with the latter by gravity, and thereby tending to hold the carton against vertical displacement during the operations of closing the side flaps *a* and *b* and end closure *c* with its tuck end *d* which extend from the forward end of said carton body C.

The means for closing the forward end of carton C comprises the following mechanisms:

Journaled in and between the bearing frames 33 and 34 is a shaft 36 which is driven by suitably timed power transmission means (not shown). Fixed on said shaft 36, so as to be revolved thereby, are a pair of spaced apart rotating folder members 37 and 38; the one, as 37, being positioned to operate on side flap *a*, and the other, as 38, being positioned to operate on side flap *b*, and both being operative upon the end closure member *c* and its tuck end *d*. Folder members 37 and 38 are preferably of a segmental shape, respectively having operative circumferential faces 39 and 40 which are concentric to the axis of rotation and the plane surfaces of which are parallel with said axis of rotation. Folder member 37 is provided with a leading end 41 coincident with its circumferential face 39. Beginning at this leading end 41, the inner lateral side of folder member 37 is shaped to provide an angular cam face 42 helically extending to merge into said circumferential face 39. The inner lateral side of folder member 38 is also shaped to provide an angular cam face 43 helically extending to merge into its circumferential face 40. The leading end portion of folder member 38 is truncated, as at 44, thus forming an effective leading end 45 (from which said cam face 43 extends), which is spaced circumferentially rearward as related to the position of the leading end 41 of folder member 37. By reason of these relative differences between folder members 37 and 38, folder member 37 acts upon side flap *a* and initiates inturning folding or closing movement thereof in advance of the initiation of similar inturning closing movement of side flap *b* by folder member 38. Owing to this arrangement and the consequent mode of operation, folding of side flap *b* follows folding of side flap *a*, and conse-

quently no interference of the flaps one with the other can occur, especially in cases where the length of the flaps approximates or somewhat exceeds one-half the width of the carton body.

Formed in the respective circumferential faces 39 and 40 of each of the folder members 37 and 38, rearwardly of the point where the cam faces thereof merge with said circumferential faces are indented portions bounded by inwardly extending seating faces 46 which are angular to said circumferential faces, the inner ends thereof terminating at somewhat overhanging shoulders 47. Said seating faces 46 are equal to the length of tuck end *d* of the carton end closure member *c*, which they are adapted to engage, and the junctures of said seating faces 46 with the circumferential faces form fold aligning ridges 48. The junctures of the outer ends of shoulders 47 with the circumferential faces form folder nosings 49.

Journaled in and between the bearing frames 33 and 34, outwardly of said folder member shaft 36, is a rock-shaft 50. Fixed on said rock-shaft 50 is an inwardly extending arm 51 provided at its free end with a presser member 52 which overhangs said folder members at a position intermediate the same. Fixed on said folder member shaft 36 is a cam 53 adapted to be rotated with said folder members. This cam is provided with a high or lift section 54, terminating at its trailing end in an abrupt drop or step 55 intermediate said high or lift section and the low section of said cam. Cooperative with said cam 53 is a lever arm 56 affixed to rock-shaft 50; said lever arm having a roller stud 57 operatively engaging the periphery of cam 53. Said rock-shaft is yieldably turned to maintain said lever arm 56 and its roller stud 57 in operative engagement with cam 53; the means for the purpose comprising a lever arm 58, affixed to rock-shaft 50, which is subject to the pull of a spring means 59.

Journaled in and between the bearing frames 33 and 34, inwardly of and above said folder member shaft 36, is a second rock-shaft 60 upon which are fixed oscillatable push-fingers 61. Also fixed on said rock-shaft 60, between said push-fingers 61, is a center push-finger 62 having at its free end a nosing 63 which leads the effective faces of said push-fingers 61. Said push-fingers are normally up-swung, subject to a timed down-swinging movement, for purposes to be described; rock-shaft 61 having a crank-arm 64 actuated by a link 65 from a suitable actuating means (not shown), whereby said push fingers are oscillated by the rocking of said rock-shaft.

Subsequent to the "squaring" or expanding of the carton, as above described, timed rotation of shaft 36 revolves the folder members 37 and 38 in clockwise direction, whereby the leading end of the angular cam face 42 of folder member 37 engages and initiates the inturning of folding movement of side flap *a*, and after side flap *a* is thus started the angular cam face 43 of folder member 38 initiates a like inturning or folding movement of side flap *b*. In the meantime the leading ends of the circumferential faces 39 and 40 of folder members 37 and 38 pass beneath the outwardly projecting end closure member *c* and its tuck end *d*, until the latter enters the indented portions thereof and overlies the seating faces 46. As said tuck end *d* is approached by said seating faces 46, the high or lift section 54 of cam 53 is effective to turn the rock-shaft 50 so as to upswing the presser member 52; by the time, however, seating faces 46 are disposed beneath tuck end *d*, the roller stud 57 of lever arm 56 passes the step 55 and drops off the high or lift section of cam 53, whereby the rock-shaft 50, under the influence of its control spring 59, is turned to swing presser member 52 down upon tuck end *d*, thus pressing the same flatly down upon the seating faces 46, with the juncture of tuck end *d* and its closure member *c* bent across aligning ridges 48, thus assuring, in the subsequent operations a true and square bending of tuck end *d* relative to closure member *c* along the score line at the juncture thereof, and preventing any tendency to crooked relative bending movements of these parts (see Fig. 4). As the folder members 37 and 38 continue to revolve, the extremity of tuck end *d*, which abuts the shoulders 47, is withdrawn from beneath presser member 52 and nosings 49 engage said tuck end *d* with inturning effect thereupon which tends to double or fold the same inwardly and beneath end closure member *c* while at the same time upswinging the latter about its scored juncture with the carton body, thus "breaking" the latter joint and eliminating any "spring" therefrom (see Fig. 5). As folder members continue to revolve, tuck end will be infolded until it escapes nosings 49, and is engaged by the trailing ends of the circumferential faces 39 and 40 of said folder members, until finally the trailing ends 66 underlie the thus infolded tuck end *d*. By the time this has occurred, the oscillatable push-fingers 61—62 are moving in downswinging direction to engage end closure member *c* (see Fig. 6), so that as said trailing ends 66 of folder members 37—38 move downwardly to lower the extremity of tuck end *d* into registration with the open end of carton body and beneath the infolded side flaps *a*—*b*, said push-fingers continue to swing down with downfolding effect upon end closure member *c*, while at the same time operating to thrust tuck end *d* into the carton interior (see Fig. 7), thus completing the closing of the forward carton end. The leading nosing 63 of the center push-finger 62 engages the body of end closure member *c*, since said center push-finger 62 is shorter than the outlying push-fingers 61, and by its inward pressure upon an intermediate portion of said end closure member *c*, tends to push inward such intermediate portion and the underlying side flaps *a*—*b*, so as to somewhat stretch the joints of these parts with the carton body, thus not only assuring a tightly and fully closed condition thereof, but further aiding in eliminating any "spring" tending to a reaction of these parts from the desired tightly and fully closed condition thereof.

After one end of the carton has been closed, the same may be upturned and passed on to receive the content desired to be enclosed therein, whereupon the opposite end of the carton is closed to complete the full closure thereof. The means for manipulating the side flaps *a'* and *b'* and end closure member *c'* with its tuck end *d'*, to thus close the filling end of the carton, comprises the following mechanisms:

After a carton is filled it is received in upstanding position, with its open end upward upon a runway 67 along which it is propelled step by step, for submission to closing mechanisms, which in kind and general arrangement approximate those disclosed in prior U. S. Letters Patent No. 1,733,588. The means for propelling the cartons through runway 67 is shown and described in the aforementioned U. S. Letters Patent No. 1,622,709, and comprises a longitudinally reciprocable rock-shaft 68 to which is se

cured by bracket blocks 69 a carrier 70 having a series of inwardly projecting push-pieces 71, the latter being spaced so as to receive the cartons therebetween. The carrier 70 is oscillated by the rocking movement imparted to rock-shaft 68 so as to withdraw the push-pieces 71 from carton engaging relation upon the retractive or recovery stroke of the carrier and then engage the same with the carton during the operative or advancing stroke of the carrier. Supported adjacent to runway 67 are longitudinally spaced standards 72, having at their their upper ends laterally offset bearing members 73, portions of which overhang said runway 67. Journaled in and between said bearing members 73 is a driven shaft 74, which may be actuated by chain and sprocket transmission 75 and gearing 76. Fixed on said shaft 74, so as to be revolved thereby, are a series of arms 77, 78 and 79. Arm 77 is provided with a primary liner folder 80 and arm 78 with a secondary liner folder 81, which function to fold a liner with which, in some cases, the carton may be provided; while arm 79 is provided with a side flap folding cam 82 operative upon side flap *a'* of carton C, all as more particularly described in aforesaid U. S. Patent No. 1,733,588.

Secured to a bearing member 73 beyond the group of folder arms, to lie adjacently above the path of movement of the cartons, is an anvil piece 83 having at its rearward end a rounded folder nose 84, to engage and infold side flap *b'* of carton C as the same is advanced beneath anvil piece 83. As carton C moves under anvil piece, and comes to a stop while the carrier is recovering for a succeeding operative stroke, the end closure member *c'* with its extended tuck end *d'* will pass behind said anvil piece, so that tuck-end *d'* will project above the sharp upper edge of the latter. Journaled in and between standards 72 is an oscillatable shaft 85, the rocking movements of which are produced by a lever arm 86 connected by a link 87 to an oscillating lever 88 actuated by means (not shown) calculated to produce properly timed movements of said shaft 85 and mechanism carried thereby. Fixed on said shaft 85 is a tuck-end folder and creaser 89, which swings down upon and folds said tuck-end *d'* over said anvil piece 83.

Fixed on the carrier 70 is a tuck end holding and guiding block 90 having an angular face 91, to hold the tuck end *d'* in the position to which it has been turned by the folding of the same over anvil piece 83, and also having a stop projection 92 to retain the end closure means *c'* in proper position preliminary to final closing and tucking operations. Said final closing and tucking operations are performed by push-finger means carried and oscillated by said oscillatable shaft 85.

Said push finger means comprises a pair of spaced push fingers 93 and 94; one of which, as 93, is rigidly fixed on shaft 85, and the other of which, as 94, is loose on said shaft 85 subject to a limited yielding movement as determined by a radial pin 95 fixed in the shaft and engaged in a slot 96 provided in the hub of said push finger 94. Projecting from the hub of push finger 94 is an anchor post 97 to which is fixed a pull spring 98, the opposite end of which is connected with an anchoring support 99 affixed to the adjacent bearing member 73. Spring 98 yieldingly holds the free operative end of push finger 94 advanced beyond the fixed position of the free operative end of push finger 93. Pivotally connected with the free operative ends of each of said push fingers 93 and 94 are yieldable ironer pieces 100, provided, to spring upwardly and outwardly from their pivoted ends, with controlling arms 101. Said arms are provided with laterally projecting stop pins 102, which, by engagement with the backs of said push fingers limit the initial projected movement of said ironer pieces. Springs 103 interconnected between said arms 101 and the anchor posts 97 which project from the hubs of said push fingers function to yieldably project said ironer pieces 100 from the operative faces of the push-fingers.

The above described construction of means for manipulating and closing end closure member *c'* and its tuck end *d'*, the tuck-end holding and guiding block 90 being affixed to carrier 70, is caused to engage tuck end *d'* as folded over anvil piece 83 so as to hold the same in the folded position as it is slid away from the latter while the carton is advanced by carrier 70 to a position beneath the normally upraised push-fingers 93—94. As held by the block 90, tuck end *d'* is so positioned that its free extremity is registered opposite the carton mouth between the outer face wall thereof and the infolded side flaps *a'* and *b'*, thus being disposed ready for engagement by said push-fingers 93—94. Timed oscillation of shaft 86 produces a down-swinging movement of said push-fingers 93—94. Since push-finger 94 leads push-finger 93 it first comes into contact with end closure member *c'* adjacent to the far end or side thereof, so that as it moves downward the left hand corner of tuck-end *d'* (as viewed in Fig. 11) is first started into the carton, subsequent to which push-finger 93 comes into action with a following like action upon the opposite side or end of the closure. By reason of this novel mode of operation, all risk of jamming of tuck-end *d'* is avoided, and its proper entrance into the carton mouth without catching and without tendency to buckle or bend is assured. Since push-finger 94 is capable of a limited backward yielding against tension of the spring 98 and due to its pin and slot connection with actuating shaft 86, continued movement of the latter will carry push-finger 93 onward while push-finger 94 dwells, and consequently tuck-end *d'* and end closure member *c'* will be fully urged throughout their extent to tucked and closed relation to carton mouth when push-finger 93 reaches the downward limit of its movement. Owing to the provision of the yieldable ironer pieces 100 in connection with said push-fingers, end closure member *c'* will be initially engaged toward its hinged connection with the carton body, and as the push-fingers swing down, these ironer pieces 100 tend to exert an outwardly ironing or smoothing effect upon end closure member *c'* from its said hinged connection; thus preventing any buckling, bulging or bending effect and assuring a smooth, flat-lying closed disposition of the end closure member *c'*.

It will be understood that various changes may be made in the above described constructions, and many apparently widely different embodiments of this invention could be made without departing from the scope thereof as defined by the following claims. It is therefore intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:—

1. In mechanism of the kind described, a support upon which a flat collapsed carton is deliv-

ered to lie endwise across the same, a reciprocable clamp blade to enter the collapsed carton, a fixed stop engageable by the forward end of the carton body, a centering block on said clamp blade to engage the rearward end of the carton to push the forward end thereof against said fixed stop when said clamp blade enters the carton, means to expand the collapsed carton after the clamp blade enters and engages the same, and a second fixed stop to engage the rearward end of the carton body after the latter is expanded.

2. In mechanism of the kind described, a support upon which a flat collapsed carton is delivered to lie endwise across the same, a reciprocable clamp blade to enter the collapsed carton, a fixed stop engageable by the forward end of the carton body, a centering block on said clamp blade to engage the rearward end of the carton to push the forward end thereof against said fixed stop when said clamp blade enters the carton, means to expand the collapsed carton after the clamp blade enters and engages the same, a second fixed stop to engage the rearward end of the carton body after the latter is expanded, and means to engage across the expanded carton body adjacent to its forward end to hold the same against vertical displacement from said first mentioned fixed stop.

3. In mechanism of the kind described, a support upon which a flat collapsed carton is delivered to lie endwise across the same, a reciprocable clamp blade to enter the collapsed carton, a fixed stop engageable by the forward end of the carton body, a centering block on said clamp blade to engage the rearward end of the carton to push the forward end thereof against said fixed stop when said clamp blade enters the carton, means to expand the collapsed carton after the clamp blade enters and engages the same, a second fixed stop to engage the rearward end of the carton body after the latter is expanded, means to engage across the expanded carton body adjacent to its forward end to hold the same against vertical displacement from said first mentioned fixed stop, and means to manipulate side flaps and an end closure member and its tuck end at the forward end of the carton for closing said end thereof.

4. In mechanism of the kind described, a support upon which a flat collapsed carton is delivered to lie endwise across the same, a reciprocable clamp blade to enter the collapsed carton, a depressor roller cooperative with said blade, means to yieldably press said blade toward said depressor roller, said blade having a camming plane cooperative with said depressor roller operative on carton entering movement of said blade to depress its forward end portion from an initial raised position permitting carton portions to pass under the same into carton clamping relation to said support, a fixed stop engageable by the forward end of the carton body, a centering block on said blade to engage the rearward end of the carton to push the forward end thereof against said stop when said blade enters the carton, means to expand the collapsed carton after the blade enters and engages the same, and a second fixed stop to engage the rearward end of the carton body after the latter is expanded.

5. In mechanism of the kind described, a support upon which a flat collapsed carton is delivered to lie endwise across the same, a reciprocable clamp blade to enter the collapsed carton, a depressor roller cooperative with said blade, means to yieldably press said blade toward said depressor roller, said blade having a camming plane cooperative with said depressor roller operative on carton entering movement of said blade to depress its forward end portion from an initial raised position permitting carton portions to pass under the same into carton clamping relation to said support, a fixed stop engageable by the forward end of the carton body, a centering block on said blade to engage the rearward end of the carton to push the forward end thereof against said stop when said blade enters the carton, means to expand the collapsed carton after the blade enters and engages the same, a second fixed stop to engage the rearward end of the carton body after the latter is expanded, means to engage across the expanded carton body adjacent to its forward end to hold the same against vertical displacement from said first mentioned fixed stop, and means to manipulate side flaps and an end closure member and its tuck end at the forward end of the carton for closing said end thereof.

6. In mechanism of the kind described, a support upon which a flat collapsed carton is delivered to lie endwise across the same, a fixed breaker tongue to overlie the underside side flap at the rearward end of the carton, a reciprocable clamp blade to enter the collapsed carton, a breaker block on said blade to engage the upperside side flap at said rearward carton end when said blade enters the carton, means to expand the collapsed carton after the blade enters and engages the same, means to center the carton and hold the same against endwise displacement when expanded.

7. In mechanism of the kind described, a support upon which a flat collapsed carton is delivered to lie endwise across the same, a fixed breaker tongue to overlie the underside side flap at the rearward end of the carton, a reciprocable clamp blade to enter the collapsed carton, a breaker block on said blade to engage the upperside side flap at said rearward carton end when said blade enters the carton, means to expand the collapsed carton after the blade enters and engages the same, means to center the carton and hold the same against endwise displacement when expanded, and means to manipulate side flaps and an end closure member and its tuck end at the forward end of the carton for closing said end thereof.

8. In mechanism of the kind described, a support upon which an expanded carton is disposed to lie endwise across the same, means to hold the expanded carton against shifting on said support, and means to manipulate side flaps and an end closure member and its tuck end at the forward end of said carton for closing said end thereof, comprising a pair of spaced rotated sectoral folder members having circumferential faces concentric to the axis of rotation and angular cam faces at their inner sides extending helically to merge with said circumferential faces, said circumferential faces being indented adjacent to their trailing ends to provide inwardly inclined tuck end seating faces having fold aligning ridges at the junctures thereof with said circumferential faces, stop shoulders at the inner ends of said seating faces terminating at their junctures with said circumferential faces in push nosings, an oscillatable presser member timed to engage the carton tuck end flatly upon said seating faces and to break the fold thereof across said aligning ridges, and means synchronized with the movement of said folder members for

moving the carton closure member to closed position while thrusting its tuck-end into said carton.

9. In mechanism of the kind described, a support upon which an expanded carton is disposed to lie endwise across the same, means to hold the expanded carton against shifting on said support, rotatable folder members to manipulate side flaps and an end closure member and its tuck end at the forward end of said carton for closing an end of the latter, a pair of laterally spaced oscillatable push-fingers adapted to swing downward the carton closure member into closed relation to the carton end while thrusting said tuck end into said carton, said push-fingers being operative after said closure member and its tuck end are operatively positioned relative to said carton end by said folder members, a push-finger intermediate the members of said pair of push fingers and adapted to be simultaneously oscillated therewith, and means to actuate said push-fingers in timed relation to said folder members, said intermediate push-finger being shorter than the first mentioned push fingers, and having at its free end a nosing projected beyond the effective face planes of the latter.

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