United States Patent [19]

Melton

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[54] **CARTON COVER CLOSING MACHINE**

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[73] Assignee: **Seymour Foods, Inc.,** Topeka, Kans.

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[52] **U.S. Cl.** **53/131;** 53/376

[51] **Int. Cl.** **B65b 61/02;** B65b 7/26

[58] **Field of Search** 53/131, 376, 377

[56] **References Cited**

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2,842,920	7/1958	Carkhuff et al.	53/377 X
3,699,744	10/1972	Willsey	53/131
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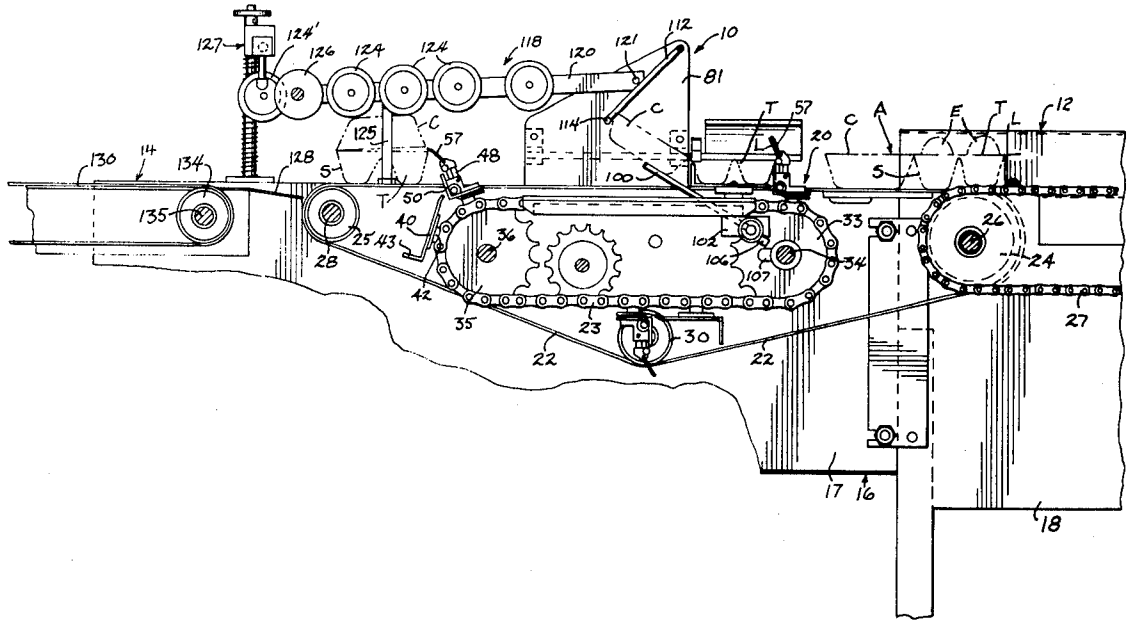
Primary Examiner—Travis S. McGehee

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[57] **ABSTRACT**

A machine for closing the cover members of egg cartons of the hinged tray type wherein open cartons are fed to the machine with the cover members hinged to the top edge of the egg receiving tray member on an axis tranverse of the direction of advance of the carton and with the cover members leading the tray members, and wherein a conveyor is provided for advancing successive cartons through the machine with associated mechanism for clamping the tray member of each carton on the conveyor while hinging a locking lug bearing panel on the trailing edge of the tray into position where the forward side wall of the cover member which has locking apertures therein, will overlie the panel when the cover member is moved toward closed position by operation of swinging members and forced down into fully closed position by a weighted set of overhead roller members. A date stamping device is provided and the cover closing members may be readily positioned to permit a clear passageway for filler flats which do not require the cover closing operations.

21 Claims, 10 Drawing Figures



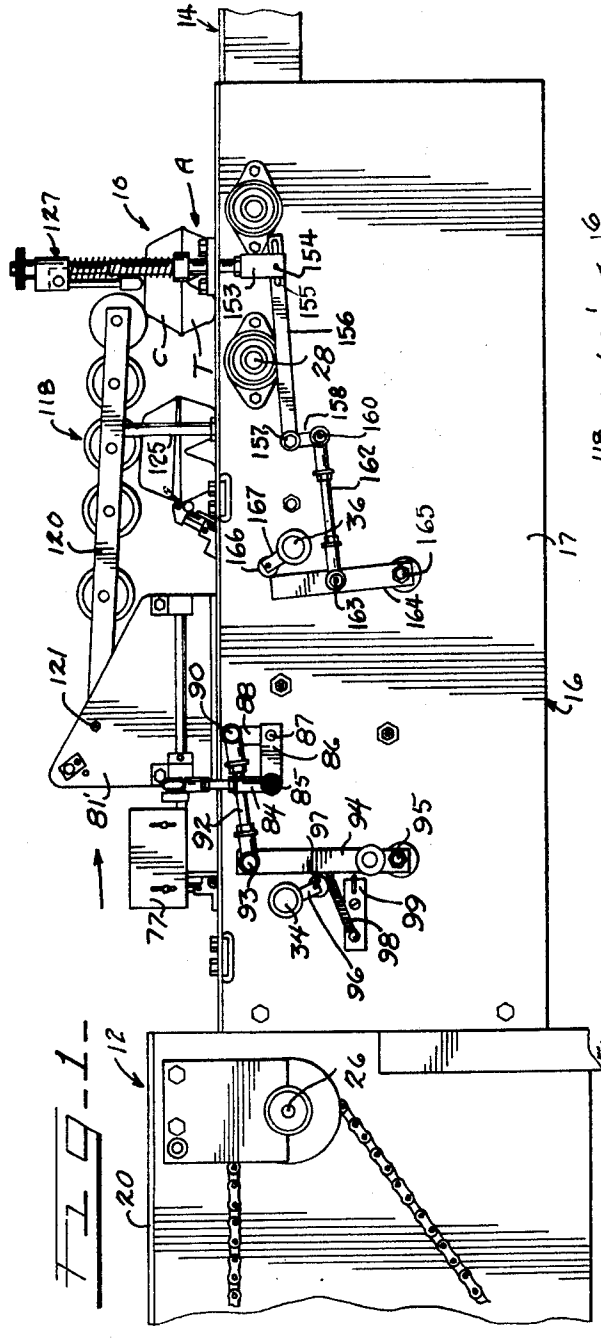


FIG-1-

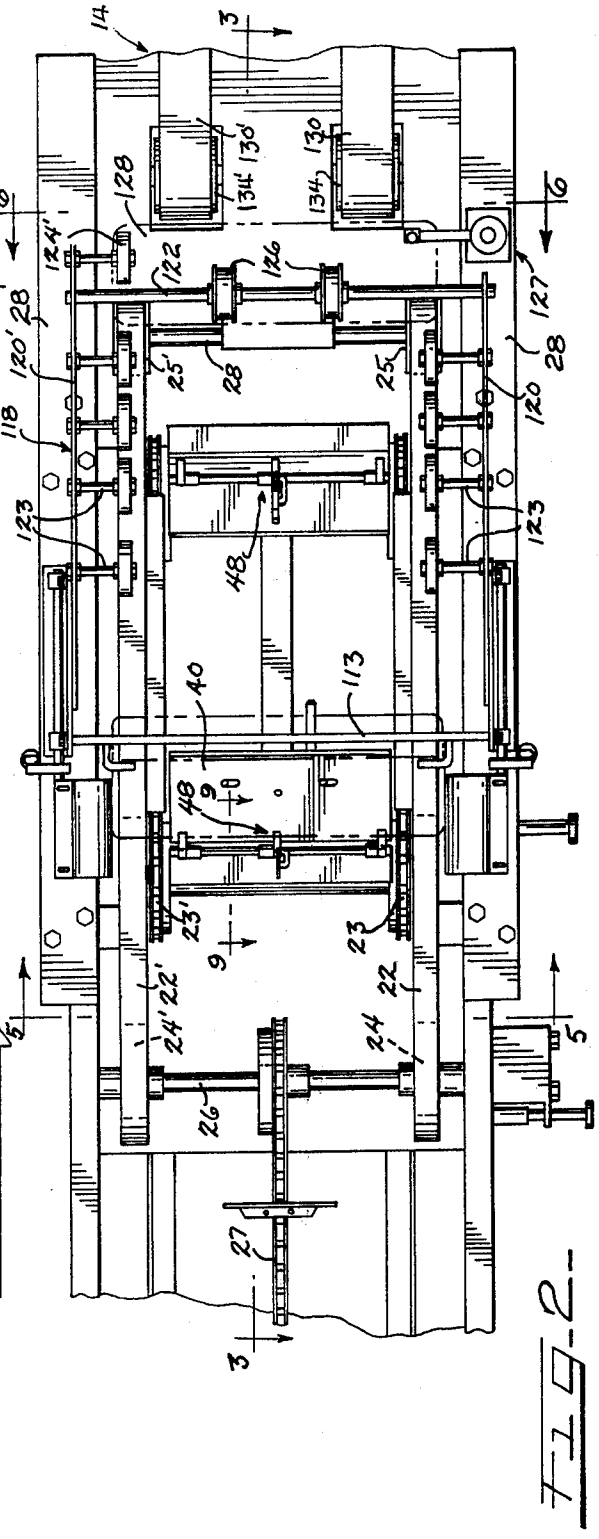


FIG-2-

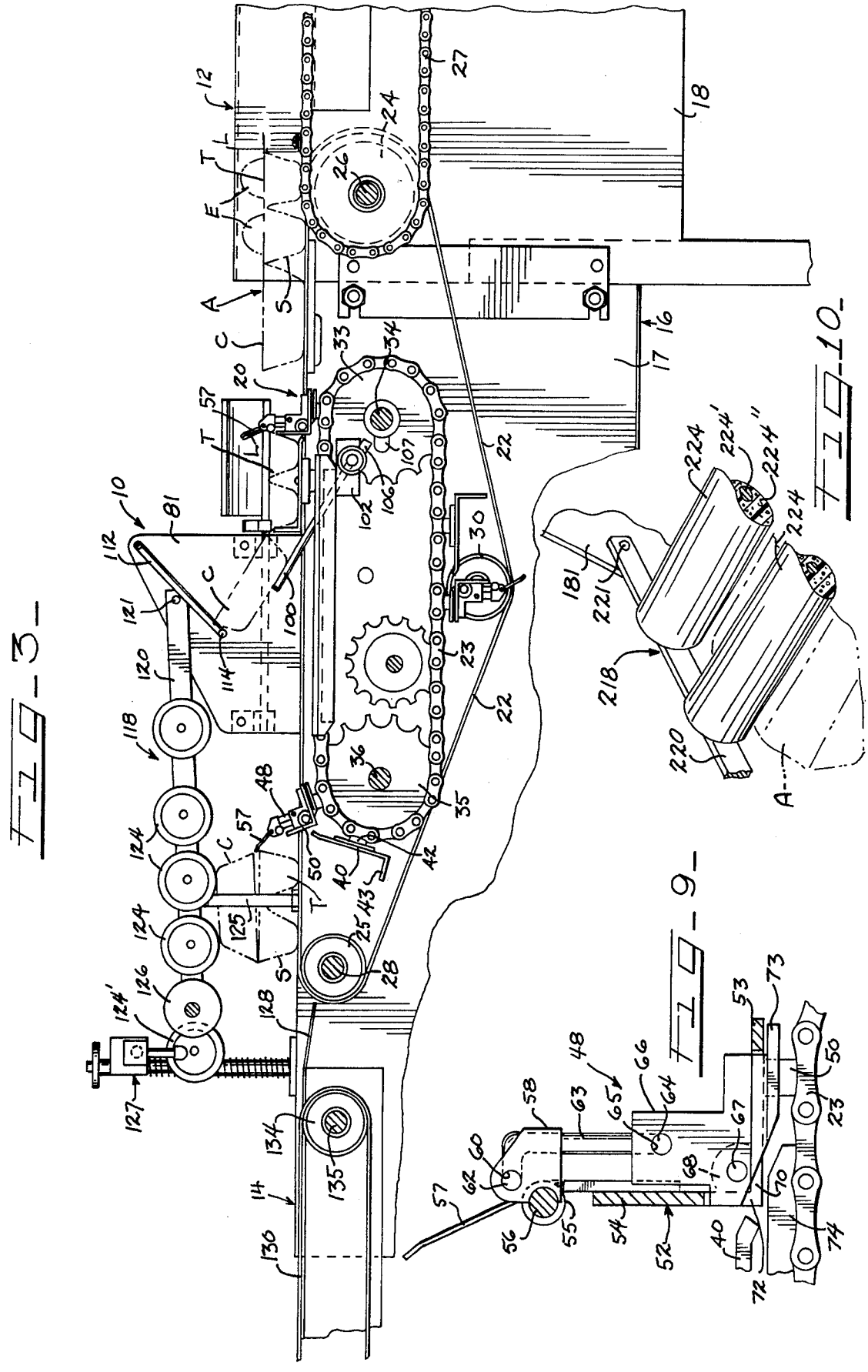

FIG-3
FIG-10
FIG-9

FIG-4-

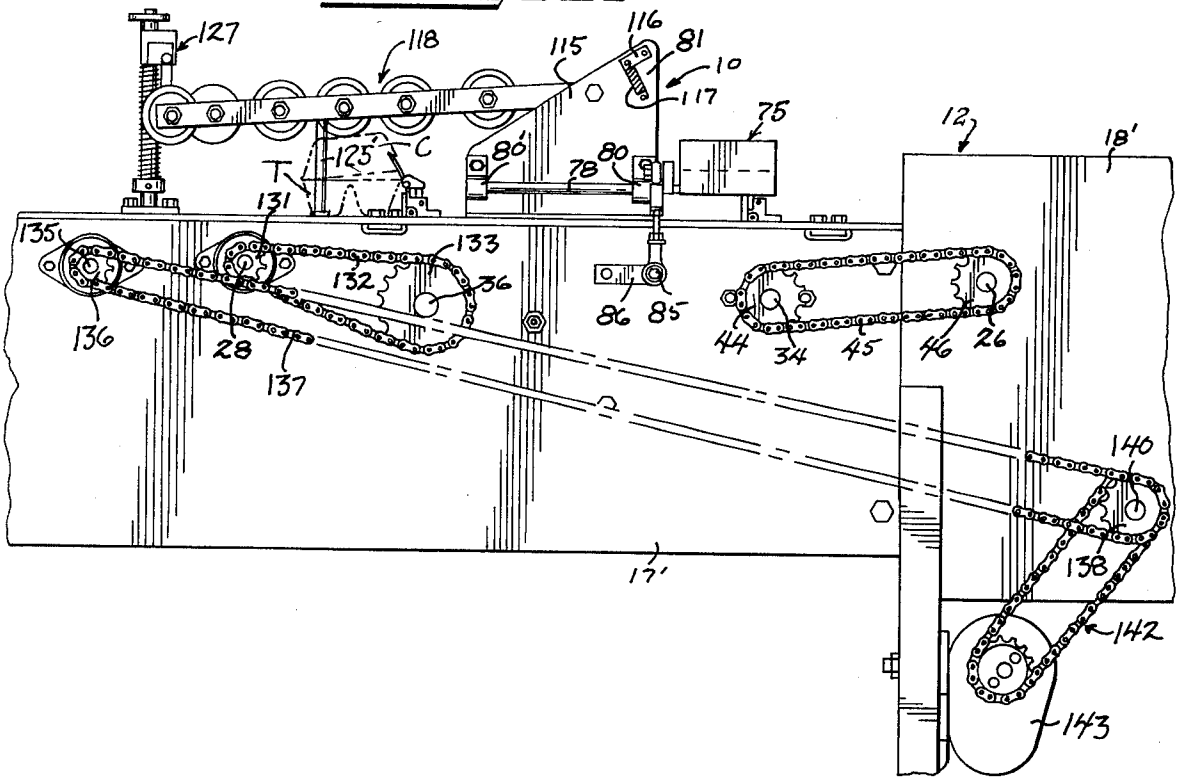

127
118
115
116
81
10
117
75
12
18'
125
C
T
80'
78
80
131
135
133
132
36
136
28
137
86
85
44
34
45
46
26
140
138
142
143
17'

FIG-5-

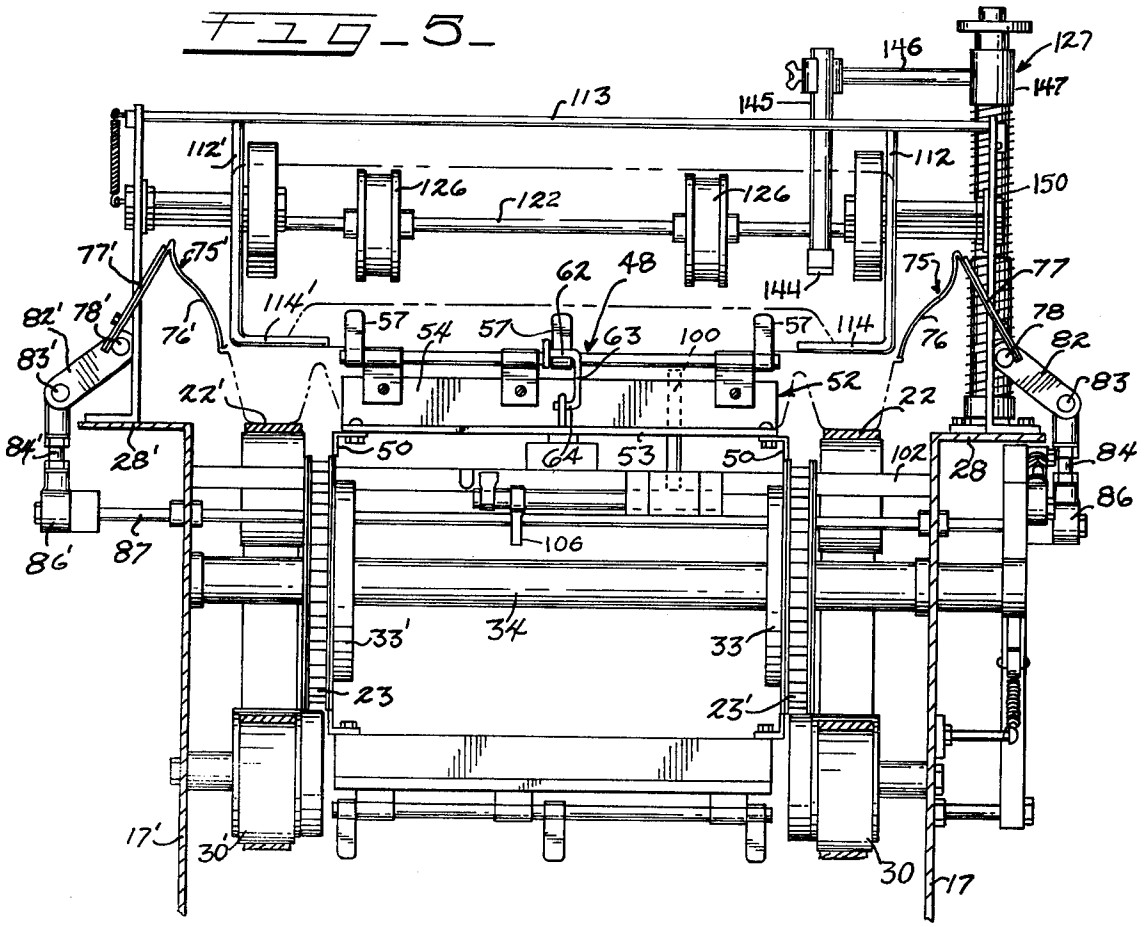

146
127
147
145
113
112'
112
126
122
126
150
77'
75'
62
48
144
75
77
82'
78'
114'
57
54
57
63
100
57
114
76'
76
78
82
83'
83
22'
52
22
84'
28'
50
64
53
50
102
28
84
86
86'
87
106
34
33'
33
23
23'
17'
30'
30
17

FIG_6_

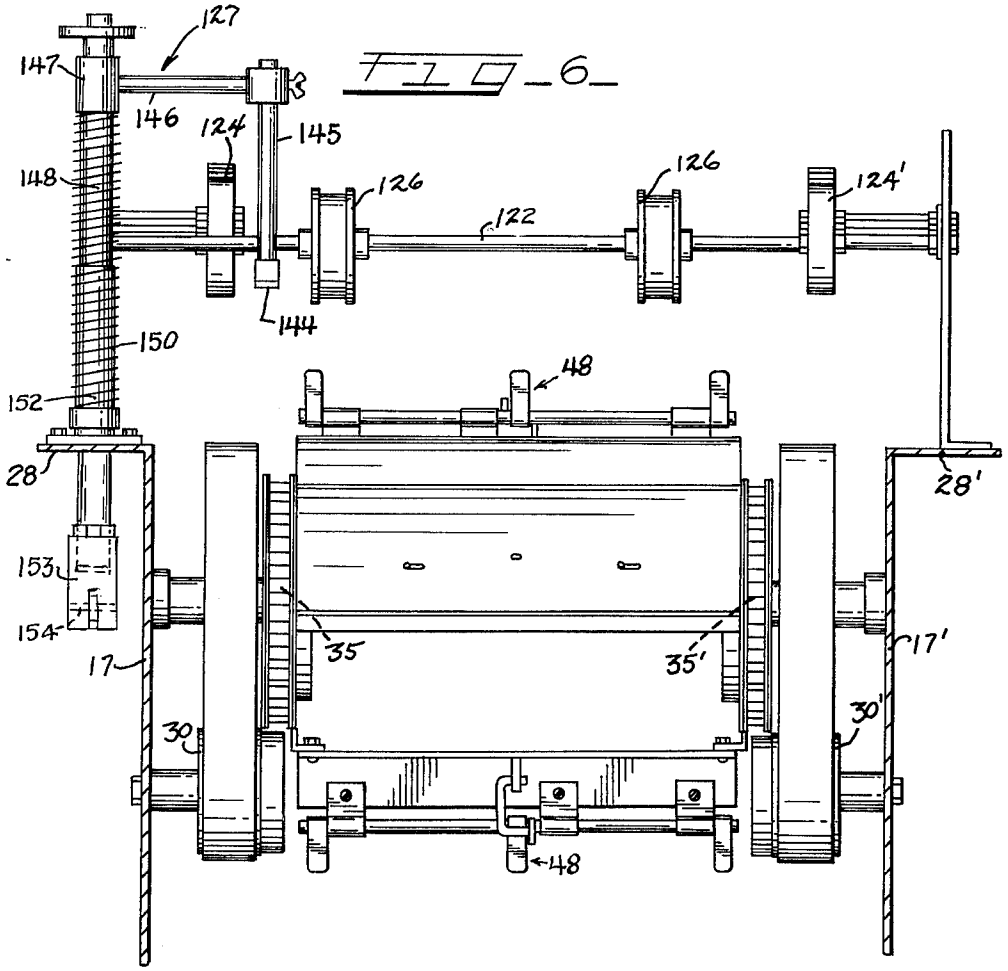


FIG_7_

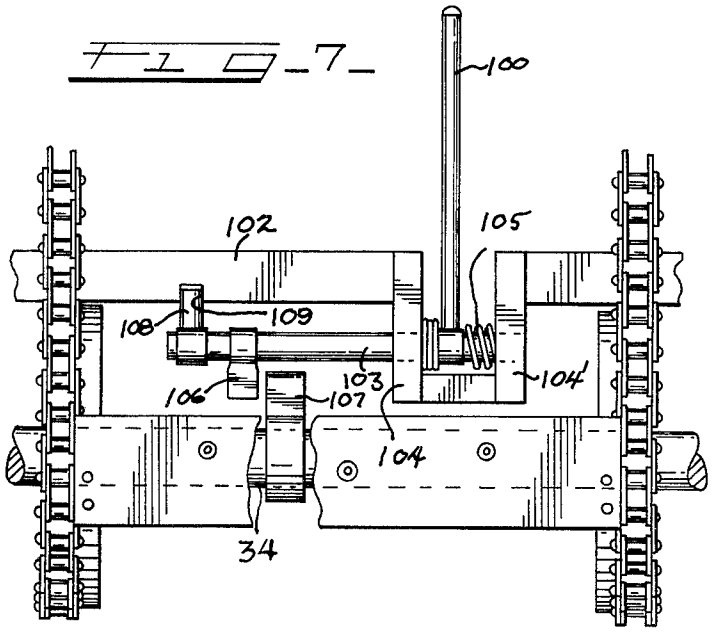
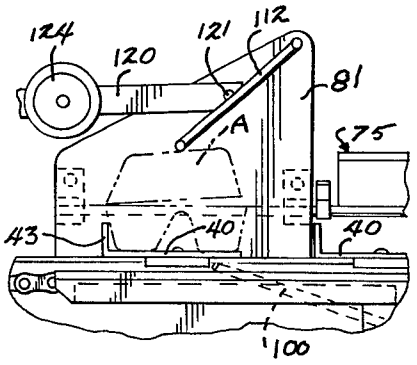


FIG_8_



CARTON COVER CLOSING MACHINE

This invention has to do with egg packaging and is particularly concerned with improvements in an apparatus for closing and latching or locking the lids or cover members on egg cartons of the type having a cellular tray in which the eggs are supported and an inverted tray-like hinged cover member having apertures in the side opposite the hinge for co-operation with latch or lock formations which are hinged to the corresponding side of the cellular tray.

In the handling of shell eggs for retail marketing one conventional consumer package is in the form of a cellular bottom tray in which the eggs are supported and along one side of which an inverted tray-like cover member is hinged, which cover member has spaced locking or latching apertures in the side opposite the hinge for co-operation with locking or latching lug formations which are hinged to the top edge of the corresponding side of the bottom tray and adapted to be swung inwardly so as to underlie the apertured cover side wall. This type egg packaging container has long been fabricated of molded pulp and has replaced to a large extent the partitioned paperboard carton which was initially developed for this purpose. More recently, there has been introduced with considerable success, cartons which are molded of foam plastic and which are of substantially less weight. The foam plastic cartons are generally considered to be more attractive in appearance and provide other advantages over the molded paper or pulp cartons for this purpose. In some degree the development of filler flats, which are employed in the larger containers used for bulk packaging of shell eggs, has followed the same pattern. Initially, paperboard filler and flat arrangements were employed and these have been replaced generally by molded pulp filler-flats and filler-flat combinations, some of which are now being manufactured from foam plastic. The handling of the retail carton packages by machinery is highly desirable in order to obtain volume production but the production of satisfactory machines for this purpose has presented designers with some difficult problems. A number of designs suggested have not been entirely successful for a number of reasons. One machine which has been used successfully in commerical packaging of retail egg cartons is shown in U.S. Pat. No. 3,699,744, granted to Charles H. Willsey, on Oct. 24, 1972. When required to handle cartons which are formed of the plastic materials, it has been found that some packaging machines of this general type do not perform with the desired efficiency since the cartons have surfaces which do not slide readily when in contact with metal members along which they are moved in machines of this type. Also, machinery has been developed which is designed to be operated to pack eggs in either retail cartons or in filler flats. The filler flats have a greater number of rows of egg pockets than the retail cartons and they do not require any cover closing operations. One such packing machine is shown in an application for Egg Handling Apparatus, Ser. No. 355,310, filed by Charles H. Willsey, now U.S. Pat. No. 3,820,301 on Apr. 30, 1973. The carton closing mechanisms heretofore developed, generally, have not been adapted to permit the passage therethrough of filler flats which have been filled by a packaging machine having such capability, and, consequently, they have not been satisfactory for use with machines of this

type. Another type of egg carton closing machine which has been used commercially provides for moving the filled cartons in the direction of their length with plow arrangements for hinging the cover members and latch carrying panels into closing and latching position. This type carton closing mechanism is not satisfactory for use with certain packing arrangements, particularly, machines where the filled cartons are advanced from the packing machine in a direction normal to the hinge axis of the cover member since changing the direction of travel of the open cartons is objected to by packers. It is a general object, therefore, of the present invention to provide a novel carton handling machine which may be operated with a high degree of efficiency in closing hinged covers on cartons of the type commonly employed for retail marketing of eggs or similar products.

A more specific object of the invention is to provide a carton closing machine which is particularly adapted for closing and locking the hinged covers on cartons of the type for retail marketing of shell eggs and similar products when the cartons are advanced in a packaging line, in open position, from a packer or other handling equipment.

A still more specific object of the invention is to provide a machine for closing and latching the hinged cover members or lids on egg cartons or the like which are advanced to the closing machine in open condition with the cover members leading the product accommodating tray portion of the carton and adapted to be hinged to closed position on an axis extending transverse of the path of advance.

Another object of the invention is to provide an apparatus for closing hingedly mounted cover members on packaging cartons, such as pocketed egg cartons, or the like, which apparatus is adapted to advance successive cartons, with the hinged cover leading the product receiving tray portion of the carton, through a cover closing and locking mechanism which is operative to swing the cover member on a transverse axis to a closed position while hinging a locking lug panel on the trailing edge of the product tray into a position inwardly of the tray edge so as to engage the locking lugs thereon in co-operating locking apertures in the side wall of the cover member, when the cover member is hinged to fully closed position with the apertured side wall overlying the locking lug panel.

Still another object of the invention is to provide an apparatus for closing and latching the hinged cover members on tray-like cartons of the type which are commonly employed for packing shell eggs for retail marketing wherein the cartons are advanced with the hinged cover members in open position and leading the product receiving tray members, and each cover member is swung on an axis extending transversely of the path of advance to a partially closed position where the side wall of the cover member, which is remote from the hinged connection with the product receiving tray member, overlies a locking lug panel which is hinged to the wall of the product receiving tray remote from said hinged connection thereby aligning locking apertures in the cover side wall with locking lugs on the locking lug panel so as to cause the locking lugs to be engaged in the locking apertures when the cover member is subsequently pressed down into fully closed position.

A still further object of the invention is to provide a machine for handling product containers, such as, shell egg cartons and filler flats, wherein the machine in-

cludes conveyor mechanism for advancing filled cartons past means for closing the cover members of cartons as they are delivered from a packing machine or other supply source which cover closing mechanism may be, with only very slight adjustment, rendered inoperative so as to permit unobstructed passage of filler flats through the machine.

These and other objects and advantages of the invention will be apparent from a consideration of the carton handling machine which is shown by way of illustration in the accompanying drawings wherein:

FIG. 1 is a front elevational view of a carton cover closing machine which incorporates therein the principles of the invention, the machine being shown installed at the discharge end of an egg packing machine with which it is adapted to be used;

FIG. 2 is a plan view of the machine shown in FIG. 1;

FIG. 3 is a longitudinal sectional view taken on the line 3—3 of FIG. 2, to an enlarged scale;

FIG. 4 is an elevation view of the opposite side of the machine;

FIG. 5 is a cross sectional view taken on the line 5—5 of FIG. 2, to an enlarged scale;

FIG. 6 is a cross sectional view taken on the line 6—6 of FIG. 2, to an enlarged scale;

FIG. 7 is a fragmentary plan view with portions broken away;

FIG. 8 is a fragmentary elevational view showing the carton advanced to a position where the cover is only partially closed;

FIG. 9 is a fragmentary sectional view taken on the line 9—9 of FIG. 2, to an enlarged scale; and

FIG. 10 is a fragmentary perspective view illustrating a modified form of pressure roller assembly.

In the form of the invention which is illustrated in FIGS. 1 to 4 of the drawings, the carton closing machine 10 is attached to the discharge end of a carton egg packaging machine 12 and a take-away or discharge conveyor arrangement 14 is provided at the discharge end of the carton closing machine 10. The form of the machine 10 which is disclosed is particularly adapted for use with an egg packing machine which is adapted to pack shell eggs into either a carton with a hinged lid or a filler flat, such as, for example, the packer which is shown in copending application Ser. No. 355,310. The closer 10 may, however, be used with other egg handling and packing equipment with provision for delivering the egg filled containers to the entrance end of the machine in the condition illustrated in FIG. 3 of the drawings.

The carton closing machine 10 is adapted to close the cover C of an oncoming carton A which includes a cellular or pocketed bottom tray member T in which the eggs E have been deposited. The carton A is arranged as it is advanced into the machine 10 with the cover C leading the tray T and hinged at the top edge of the leading wall of the tray for swinging movement to a closed position on an axis extending transversely of the path of advance of the carton and with a narrow locking or latching panel L hinged to the top edge of the trailing wall of the tray member T.

The cover closing machine 10 comprises a supporting frame 16 (FIGS. 1 to 6) having laterally spaced, vertically disposed, parallel side plate members 17 and 17', which, in the form shown, extend in alignment with side plate members 18 and 18' of the frame 20 of the packer 12 to which the present apparatus is attached. The cartons are advanced into and through the machine 10 by a carton supporting and conveying mechanism which includes a pair of laterally spaced traveling belts 22 and 22' and a pair of traveling chains 23 and 23', also spaced laterally and disposed between the belts 22 and 22'. Belts 22 and 22' are supported on pairs of end pulleys 24, 24' and 25, 25'. The pulleys 24, 24' at one end constitute idler pulleys which are rotatably mounted in axially spaced relation on the cross shaft 26 which extends between the side plate members 18 and 18' of the packer main frame 20. The cross shaft 26 is a driven shaft supporting the delivery end of the pusher lug chain 27 which constitutes the carton advancing means of the packer. The belt carrying pulleys 25, 25' are driven as hereinafter described. In the packer machine illustrated the chain 27 is indexed in the proper sequence to advance the successive cartons for receiving successive rows of eggs by the packer filling mechanism. The packer is not further described since it does not appear to be necessary for an understanding of the present invention. A full description will be found in Ser. No. 355,310. The cartons are discharged onto the belts 22 and 22' which advance the cartons into the closing machine 10. The belts 22 and 22' are, of course, operated in synchronism with the chain 27. The top runs of the belts 22 and 22' are disposed in the same general horizontal plane as the top flanges 28 and 28' (FIGS. 5 and 6) on the side frame plates 17 and 17'. Tension in the belts 22 and 22' is adjusted by means of adjustably mounted idler rollers 30 and 30' on which the return runs of the belts ride.

The chains 23 and 23' are supported at the entrance ends on end sprockets 33, 33' which are mounted on a cross shaft 34 and at the opposite or leading ends on end sprockets 35, 35' which are mounted on the parallel cross shaft 36. Cross shafts 34 and 36 are journaled in the side frame plates 17 and 17'. The chains 23 and 23' carry a plurality of longitudinally spaced carton supporting platforms 40, each of which is connected to the chains for ready removal by a bracket assembly 42. The platform 40 has a flange 43 on the leading edge thereof against which the leading side S of the carton bottom or egg receiving tray T is adapted to be positioned. The chains 23 and 23' are advanced in synchronism with the drive of the packer conveyor chain 27. The cross shaft 34 is extended at one end and carries a sprocket 44 which is connected by a chain 45 with the sprocket 46 on the end of the drive shaft 26.

Each of the platform assemblies 40 has associated with it a latching mechanism 48 (FIGS. 2, 5 and 9) for manipulating the locking or latching panel L on the carton which mechanism 48 is supported on the chains 23 and 23' by means of transversely spaced angle brackets 50 and 50'. Each such mechanism 48 is spaced a predetermined distance relative to the associated platform 40 which leads the same. Each mechanism 48 comprises an elongate angle member 52 mounted between the chains 23 and 23' with one leg 53 thereof forming a base which is attached to chain links by the angle brackets 50 and 50'. The other leg 54 of the angle member 52 extends at right angles and upwardly thereof, in the position shown in FIG. 9, and carries a plurality of bearing forming bushing 55 supporting a cross rod 56 on which there is mounted in radial extending and axially spaced relation a plurality of tab or finger members 57. The cross rod 56 has secured

thereto a small bracket plate **58** which is apertured at **60** to receive one end **62** of a link member **63.** The other end **64** of the link member **63** seats in an aperture **65** in a vertically extending pivot plate **66.** The pivot plate **66** is mounted on a pin **67** which is rotatable in a bearing bracket **68.** The base portion of angle member **52** and the upstanding plate portion **54** are slotted at **70** and **72** to accommodate sufficient pivotal movement of the pivot plate **66** to swing the panel engaging fingers **57.** On the bottom edge of the pivot plate **66** there is a cam shoe **73** which is positioned below the base plate member **53** where it will engage a longitudinally extending cam bar **74** when the assembly **48** is advanced along the upper run of the chains **23** and **23'.** Only a relatively slight swinging movement of the pivot plate **66** is required to swing the tabs or fingers **57** against the locking panel L and move the same into position over the tray T for clearing the front wall of the cover member when the latter is turned towards the closed position. The assembly **48** is spaced relative to the carton supporting plate member **43** so as to move up into engagement with the front wall of the bottom tray T when the assembly **48** moves around the sprockets **33, 33'** at the entrance end of the conveyor.

The carton tray T is held on the platform **40** while the locking flaps are manipulated by the mechanism **48** by means of hold down assemblies **75** and **75'.** Each of the hold down assemblies **75** and **75'** comprises a carton end engaging pad member **76, 76'** (FIG. **5**) of inverted, generally V-shaped cross section with one leg adapted for edge engagement with the edge flange of the bottom or tray portion T at that end of the carton. The other leg **77, 77'** of each hold down is secured to and extends radially of the axis of a support bar or rod **78, 78'.** The support rods **78** and **78'** are mounted in longitudinally extending relation in pairs of bearing brackets **80, 80'** (FIG. 4) on vertically extending plates **81, 81'** upstanding from the top flanges **28, 28'** of the side plates **17, 17'.** The pivot bars **78, 78'** carry radially extending operating arms **82, 82'** which are pivotally connected at **83, 83'** to the upper ends of pitmen **84, 84'.** The pitmen **84, 84'** have their lower ends pivotally connected **85, 85'** to the free ends of arm members **86, 86'** which extend radially from a cross rod **87,** with the latter being journaled in suitable bearings in the main side frame plates **17** and **17'.** The cross rod **87** carries at one end arm **88** (FIG. **1**) which is connected at **90** to one end of a link bar **92,** the opposite end of which is pivoted at **93** to the top end of an upwardly extending arm **94** having its lower end pivoted at **95** on the side plate **17.** The shaft **34** supporting the chains **23** and **23'** at one end is extended and carries an arm **96** on which there is a cam roller **97** bearing against the upstanding arm **94** so that rotation of the shaft **34** will swing the arm **94** and engage the pads **76** and **76'** with a carton tray T. The arm **94** is urged in the direction of the shaft **34** by a tension spring **98** and a limit stop **99** is provided to limit the movement of the pads **76** and **76'** in the direction which disengages the carton. Thus movement of the hold down pads **76** and **76'** is controlled by the travel of chains **23** and **23'** and synchronized properly with the movement of the cartons.

A cover engaging or lift up finger or rod **100** (FIGS. **3, 5** and **7**) is mounted for swinging movement on a fixed cross bar member **102** which extends between frame plates **17, 17'** adjacent the cross shaft **34.** As shown in FIG. **7,** the rod or lift up finger **100** extends radially of the axis of a support rod **103** which in journaled in the offset housing formed by parallel spaced plate members **104** and **104'** extending in parallel relation and normal to the axis of the supporting cross bar member **102.** The pivot rod **103** for the lift finger **100** is journaled in the plate members **104** and **104'** and is centered by a compression spring **105.** The pivot rod **103** is extended at one end as shown in FIG. **7** and normally is swung to an upwardly inclined position in the path of a cover member C as a carton is advanced to the clamping or holding position shown in FIG. **3.** The pivot rod **103** carries on the extended end a cam member **106** which acts as a counterbalance to swing the lift up finger **100** to the operative position and which is normally positioned in the path of a radially extending cam member **107** on the cross shaft **34** so that rotation of the shaft **34** to advance the carton to the position shown in FIG. **3** will engage the cam members **106** and **107** and hold the finger **100** in the path of the carton as it advances toward the position shown in FIG. **3** where the cam members **106** and **107** are disengaged and the finger may be swung down by engagement of the forward edge of the carton support plate. The rod **103** for supporting the finger **100** may be slid in the bearings in the supporting plates **104** and **104'** to the position shown in FIG. **7** by compressing the spring **105** and a radially extending latching lug **108** on the feee end of the rod **103** may be turned into a holding slot **109** in the cross bar member **102.** The one side of the spring **105** is sufficiently compressible to permit the sliding movement and to hold the latching lug **108** in the slot **109.** Finger **100** is turned down out of the way and moved to the position in FIG. **7** so as to engage the latching lug **108** in the slot **109** and hold the finger **100** in inoperative position in order to clear way for advancement through the mechanism of a filler flat which does not require any closing operation. With the hold downs **75, 75'** engaging the tray, the mechanical holding of the lifting finger in the up position by interengagement of cam members **106** and **107** insures that the lid or cover C will break on the hinge line and swing upwardly, as shown in FIG. **3,** where it is ready to be turned over into closing position.

A lid turnover device in the form of two angle shaped rod members **112** and **112'** depend from a cross rod **113** and have their inwardly bent ends **114, 114'** in the path of the advancing cover member C when it is lifted by the finger **100** as shown in FIG. **3.** The cross rod supporting the fingers **112** and **112'** extends between the vertically disposed support plates **81** and **81'** which extend upwardly of the top flanges **28** and **28'** which extend upwardly of the top flanges **28** and **28'** on the side frame plates **17** and **17'.** A radial arm **116** (FIG. **4**) on the one end of the rod **113** has one end of a spring **117** attached to its free end with the other end of the spring anchored to the plate **81** so as to urge the lid or cover fold down arms **112** and **112'** in the direction of the cover member C. As a carton advances beyond the position shown in FIG. **3** the cover or lid member C is turned over onto the top of the tray T by the arms **112** and **112'** and the carton is advanced beneath a roller assembly **118.**

The roller assembly **118** comprises a supporting frame in the form of side arms **120** and **120'** which are pivoted at **121** and **121'** to the upstanding support plates **81** and **81'** and connected at the opposite ends by a cross rod **122.** Each of the frame side arms **120**

and 120' carries a series of longitudinally spaced, relatively short roller support rods 123 which extend inwardly of the arms 120 and 120' and each has mounted on the free inner end a skate roller 124. The skate rollers 124 are rubber coated or provided with tires of rubber or similar material. They are in laterally spaced, paired arrangement so as to press on the top of a closed carton advancing beyond the lid closing station. The pivot or hinge points 121, 121' are spaced vertically so that the frame will slant downwardly in the direction of the discharge end of the machine, as shown in FIGS. 1, 3 and 4, and apply progressively increasing pressure on the carton lid as it advances. A pair of posts 125, 125' upstanding from the plate flanges 28, 28' provide stops for limiting the downward swing of the roller frame. A cross connecting rod 122 (FIGS. 2 and 5) extends between the side frame members 121, 121' and carries two axially spaced pressure rollers 126. The one side frame member 120 is shortened to make room for a date stamp mechanism 127. The end of the roller frame is disposed over a dead plate area 128 at the discharge end of the conveyor belts 22, 22' where the advance of the closed carton is stopped temporarily for the application of a date stamp. The discharge ends of the conveyor belts 22, 22' extend beyond the ends of the conveyor chains 22, 23' and advance the carton as the movement of the chains 23, 23' around end sprockets 35, 35' drops drops the platform assembly 40 and withdraws the latch panel bending mechanism 48 allowing the cover of lid C to close and latch completely under the pressure applied by rollers 124. In the dead plate area 128 the lid is held closed by the pair of rollers 126 on the shaft 122 and also an endmost roller 124' on the frame side member 120' which is disposed beyond the cross shaft 122 as shown in FIG. 2 at the free end of the side frame member 120'. The dead plate area extends between the discharge ends of the conveyor belts 22, 22' and the entrance ends of the takeaway belt conveyor members 130, 130' (FIGS. 2 and 3). Each successive closed carton remains stationary on the dead plate area 128 until it is advanced onto the belt members 130, 130' by pressure of the next succeeding closed carton.

The shaft 28 carrying the end pulleys or rollers 25, 25' for belts 22, 22' has an extended end on which there is a sprocket 131 (FIG. 4) connected by chain 132 with a sprocket 133 on the chain shaft 36, the tooth ratio being such that the belt members 22, 22' are advanced at a faster rate than the chains 23, 23' so as to insure that the cartons will be fully seated initially and held on the platform assemblies 40 as they are advanced along the path of the top runs of the chains. The belts 22, 22' are of a material which slides beneath the cartons when the carton advance is at a slower rate, that is, when the advance of the carton is controlled by the slower movement of the chains but will operate to advance the cartons at a more rapid rate when they reach the discharge ends of the chains so as to deposit the successive cartons in the dead plate area.

The discharge or take-away conveyor belts 130, 130' are carried on pulleys 134, 134' (FIGS. 2 and 3) axially spaced on a cross shaft 135 which is extended at one end to receive sprocket 136 (FIG. 4). The sprocket 136 is connected by chain 137 with a sprocket 138 on a cross shaft 140 of the packer 12. The cross shaft 140 is driven by a chain and sprocket drive 142 from the motor 143 on the packer 14.

The date stamp mechanism 127 (FIGS. 1, 5 and 6) comprises a die holder 144 on the bottom end of a vertically disposed support rod 145 which is clamped for adjustment in a vertical direction on the end of a horizontal bracket rod 146 which extends from a collar 147 mounted on a vertical post 148. A compression spring 150 surrounds the post 148. A compression spring 150 surrounds the post 148 and a vertically extending tubular member 152 which is mounted in upstanding relation on the flange 28 of the side frame plate 17. The post 148 is of a length to extend through an aperture (not shown) in the flange 28 with its lower end carrying a linkage connector 153 (FIGS. 1 and 6) with a pin 154 slidable in a slot 155 in the end of a link bar 156 which has its other end pivotally connected at 157 to the end of one arm 158 of a bell crank member which is pivotally mounted at 160 on the side frame plate 17. The other arm of the crank member is in the form of an adjustable rod 162 having its free end pivotally connected at 163 intermediate the ends of a vertically disposed bar member 164. The lower end of the bar member 164 is pivotally mounted at 165 on the side frame plate 17. The bar member 164 is positioned so as to be oscillated by a cam roller 166 on the end of a radial arm 167 which is mounted on the extended end of the chain cross shaft 36. Oscillation of the bar member 164 raises and lowers the date stamp die holder 144 in timed relation to the movement of the carton carrying conveyor chain mechanism.

Details of the operation of the machine will be understood from the foregoing description. The filled cartons in open condition are advanced from the packer 12 in succession and received on the successive platform assembly 40 as the conveyor chains 23, 23' are indexed with the indexing of the carton conveyor chain 27 on the packer. The clamping mechanisms 75, 75' operate to restrain ghe successive cartons against upward movement while the cover or lid hinge is broken and the carton is advanced to hinge the lid toward closed position by the finger 100 and the overhead rod members 114, 114'. The pressure exerted by the weight of the roller assembly 118 closes the cover as the carton leaves the platform assembly 40 and the latching flap manipulating mechanism is withdrawn. The closed carton is discharged onto the dead plate area 128 where the date stamp assembly 127 is operated to stamp the date on the cover. The next carton delivered to the dead plate area 128 moves the preceding carton onto the discharge or takeaway conveyor belts 130, 130'. The mechanism is adjusted to pass through filler flats by removing the angle plates 40 and depressing the lid lifting finger 100 to the inoperative position and latching the same as previously described.

A modified pressure roller assembly 218 is shown in FIG. 10 where the pressure applying skate rollers employed in the form of the machine shown in FIGS. 1 to 6 and 8 are replaced by rollers 224 which are longer so as to extend substantially across the top of the lid on the carton A, portions of the latter being shown in phantom line. The rollers 224, as illustrated, extend between the side arms 220 of the mounting frame which are pivoted at 221 to the upstanding side plates 181 in the same manner as in the corresponding frame for the roller assembly which is shown in FIGS. 2 and 3. The rollers 224 comprise supporting cross shafts 224' which are journaled in the side arms 220 of the mounting frame and which are of relatively small cross sectional

diameter, with a roller body **224''** of sponge-like material, such as, sponge rubber, or similar relatively soft resilient material which is of substantially greater diameter than the corresponding dimension of the supporting shafts **224'**. The rollers **224,** which may be spaced as desired in the direction lengthwise of the machine, are adapted to apply pressure to the lid in the central areas, as well as at its ends, so as to better insure latching engagement of the locking lugs in the central areas while at the same time providing for less concentration of pressure, thereby reducing the likelihood of breakage when closing cartons packed with extra large eggs and achieving greater efficiency in effecting complete closure of the latter.

I claim:

1. An apparatus for closing and latching the hinged cover member on cartons of the type which have a product receiving bottom tray with a tray-like cover hinged along one side edge and a relatively narrow panel hinged along the opposite side edge with one or more latching lugs for engagement in co-operating latching openings in the side wall adjacent the free edge of the hinged cover member, conveyor means for advancing successive cartons along a generally horizontal path with the cover member leading the bottom tray member, means for clamping the bottom tray on the conveyor means, means for swinging the latching lug panel inwardly of the trailing side wall of the bottom tray member, means for engaging the cover member so as to cause said cover member to swing on an axis extending transversely of the path of advance toward a closed position, and means for progressively pressing down on the cover member as it is advanced by said conveyor means so as to completely close the cover member and position the side wall for engagement therein of latching lugs in the latching lug panel.

2. An apparatus as set forth in claim **1** wherein said conveyor means comprises a pair of laterally spaced, endless traveling members with carton supporting platforms extending between the same.

3. An apparatus as set forth in claim **1** wherein said conveyor means comprises a pair of endless traveling members which are spaced transversely of the path of advance with longitudinally spaced carton supporting means extending between the same.

4. An apparatus as set forth in claim **1** wherein said conveyor means comprises an endless traveling member with carton support means thereon and with the traveling member having a top run defining said horizontal path.

5. An apparatus as set forth in claim **1** wherein said conveyor means comprises an endless traveling member with carton support means thereon and with the traveling member having a top run defining said horizontal path and a pair of endless traveling side conveyor members each having a top run on which an end portion of each carton will rest when on said carton support means, and means for driving said side members at a faster rate than the travel of said support means so as to frictionally urge the cartons in the direction of advance and hold the cartons in predetermined position on their support means as they are advanced.

6. An apparatus as set forth in claim **1** wherein said means for engaging said cover member so as to cause said cover member to swing on a transverse axis comprises an elongate rod member normally disposed at an upwardly inclined angle in the path of advance of the carton cover member.

7. An apparatus as set forth in claim **1** wherein said means for engaging said cover member so as to cause said cover member to swing on a transverse axis comprises an elongate rod member pivotally mounted at one end on a cross bar extending beneath said horizontal path and normally disposed in an upwardly inclined position so as to extend into the path of the carton.

8. An apparatus as set forth in claim **7** wherein said rod member is mounted so as to permit movement to an inoperative position out of the path of advance of the cartons with means for frictionally holding said rod member in said inoperative position.

9. An apparatus as set forth in claim **7** wherein said rod member has an associated cam arm thereon and said carton conveyor means has a co-operating cam arm arranged to engage the cam arm on said rod member so as to hold said arm in the upwardly slanted operative position for a predetermined time during advance of said carton by said conveyor means.

10. An apparatus as set forth in claim **1** wherein said means for swinging said latching lug panel inwardly of the trailing side wall of the bottom tray member comprises a panel engaging mechanism mounted on said conveyor means so as to engage beneath each latching lug panel as each successive carton is received on said conveyor means and having panel engaging fingers mounted for swinging movement in the direction of advance of the carton.

11. An apparatus as set forth in claim **10** wherein said panel engaging fingers are mounted on a cross shaft with cam means for turning said shaft and including a cam operating track member extending along said path for holding said panel engaging fingers in panel engaging position while each carton is advanced along said path.

12. An apparatus as set forth in claim **1** wherein said means for clamping said bottom tray on said conveyor comprises a clamp mechanism mounted at each side of the path of said conveyor means with a tray engaging clamp arm mounted for swinging movement into and out of engagement with the tray member of each successive carton so as to restrain said tray member against movement upwardly of said tray member.

13. An apparatus as set forth in claim **12** wherein said clamp arm of each said clamp mechanism is mounted on a longitudinally extending shaft and means for oscillating said shaft in timed relation to the movement of said conveyor means.

14. An apparatus as set forth in claim **1** wherein said means for engaging the cover member so as tro cause said cover member to swing toward a closed position comprises an elongate rod member normally inclined upwardly in the path of advance of the cover member so as to cause said cover member to swing in an upward direction and also an overhead member with a portion depending into the path of said cover member when it is swung upwardly by said elongate rod member which is operative to further swing said cover member toward a fully closed position.

15. An apparatus for closing and marking the hinged cover members on cartons of the type which have a bottom tray and a tray-like cover hinged along one side edge thereof, traveling conveyor means for advancing successive cartons along a generally horizontal path with the cover member in open position and leading the

bottom tray member, clamp means disposed at a predetermined position along said path which is operative to engage the bottom tray member and restrain upward movement thereof relative to said traveling conveyor means, means at a predetermined position along said path which is operative from below said path of advance for lifting said cover member so as to swing it upwardly about said hinged side edge, means disposed above said cover member which is operative in the path of advance of the cover member to engage a leading edge of the cover member so as to force the cover member to swing in a direction towards a closed position on said bottom tray member when the carton is advanced thereto by said conveyor means, means for progressively pressing down on the cover member as the carton is advanced by said conveyor means to a dead plate area so as to completely close the cover member and to hold the cover member in closed position while in said dead plate area, a marking stamp mounting means supported for vertical reciprocation at said dead plate area, and means for reciprocating said marking stamp mounting means in timed relation to the operation of said carton conveyor means so as to mark each successive carton cover.

16. An apparatus for closing the hinged cover members on cartons of the type which have a bottom tray and a cover hinged along one side edge, conveyor means for advancing successive cartons in fully open condition along a generally horizontal path with the hinge axis of the carton extending transversely of the path of advance and with the cover member leading the bottom tray member, means at a predetermined point along said path for engaging the bottom tray of successive cartons so as to restrain the tray against upward movement relative to the conveyor means, means disposed in part below the path of advance of the conveyor means which is operative to engage said cover member so as to cause said cover member to swing on said transversely extending hinge axis toward a partially closed position, and means for progressively applying downward pressure on said cover member as it is advanced by said conveyor means so as to completely close the cover member.

17. An apparatus as set forth in claim **16** wherein said means for applying downward pressure on said cover member comprises a pivotally mounted overhead frame having pressure applying skate rollers mounted thereon so as to engage the top cover members of successive cartons as they are advanced beyond the means for engaging and swinging the cover members toward a closed position.

18. An apparatus as set forth in claim **16** wherein said means for applying downward pressure on said cover member comprises a generally rectangular frame with laterally spaced side frame members having mounted thereon a plurality of skate rollers which are disposed to rest on the cover members at their opposite ends.

19. An apparatus for closing the hinged cover members on cartons of the type which have a bottom tray and a cover hinged along one side edge, conveyor means for advancing successive cartons in fully open condition along a generally horizontal path with the cover member leading the bottom tray member, means for engaging the bottom tray of successive cartons so as to restrain the tray against upward movement relative to the conveyor means, means disposed in the path of advance of the conveyor means for engaging a leading portion of said cover member so as to cause said cover member to swing on an axis extending transversely of the path of advance toward a partially closed position when advanced against said cover engaging means, and means for progressively applying downward pressure on said cover member as it is advanced by said conveyor means so as to completely close the cover member, which downward pressure applying means comprises a plurality of pressure rollers mounted on a supporting frame extending above said conveyor means with a trailing side of said frame pivoted at a point above the path of the cartons and with a leading side free to drop sufficiently to bring the rollers into gravity pressure engagement with the topmost face of said cover member.

20. An apparatus for closing the hinged cover members on cartons of the type which have a bottom tray and a cover hinged along one side edge, conveyor means for advancing successive cartons in fully open condition along a generally horizontal path with the cover member leading the bottom tray member, means for engaging the bottom tray of successive cartons so as to restrain the tray against upward movement relative to the conveyor means, means disposed in the path of advance of the conveyor means for engaging a leading portion of said cover member so as to cause said cover member to swing on an axis extending transversely of the path of advance toward a partially closed position when advanced against said cover engaging means, and means for progressively applying downward pressure on said cover member as it is advanced by said cover means so as to completely close the cover member, which downward pressure applying means comprises a supporting frame having a trailing end pivotally mounted above said conveyor means and a leading end extending beyond the discharge end of said conveying means, pressure applying rollers mounted on said frame in laterally spaced and paired arrangement for progressively engaging the topmost face of said cover member near the center thereof.

21. An apparatus for closing the hinged cover members on cartons of the type which have a bottom tray and a cover hinged along one side edge, conveyor means for advancing successive cartons in fully open condition along a generally horizontal path with the cover member leading the bottom tray member, means for engaging the bottom tray of successive cartons so as to restrain the tray against upward movement relative to the conveyor means, means disposed in the path of advance of the conveyor means for engaging a leading portion of said cover member so as to cause said cover member to swing on an axis extending transversely of the path of advance toward a partially closed position when advanced against said cover engaging means, and means for progressively applying downward pressure on said cover member as it is advanced by said conveyor means so as to completely close the cover member, which downward pressure applying means comprises a pivotally mounted overhead frame having pressure applying rollers of relatively resilient material mounted thereon which extend transversely of said frame so as to engage the top cover members and apply resilient pressure across the top surfaces thereof as they are advanced beyond the means for engaging and swinging the cover members toward a closed position thereby pressing the cover members into fully closed position.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,884,015

DATED : May 20, 1975

INVENTOR(S) : KENNETH W. MELTON

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Line 5 of the Abstract, "tranverse" should be -- transverse --

Column 3, line 21, "elevation" should be -- elevational --

Column 4, line 64, "bushing" should be -- bushings --

Column 5, line 43, before "85, 85'" insert -- at --

Column 6, line 27, "feee" should be -- free --

Column 6, lines 51 and 52, cancel "which extend upwardly of the top flanges 28 and 28'"

Column 7, line 26, "22" should be -- 23 --
line 28, cancel the second occurrence of "drops"

Column 8, lines 6 and 7, cancel "A compression spring 150 surrounds the post 148."
line 37, change "ghe" to -- the --

Column 10, line 52, change "tro" to -- to --

Signed and Sealed this

ninth Day of December 1975

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks