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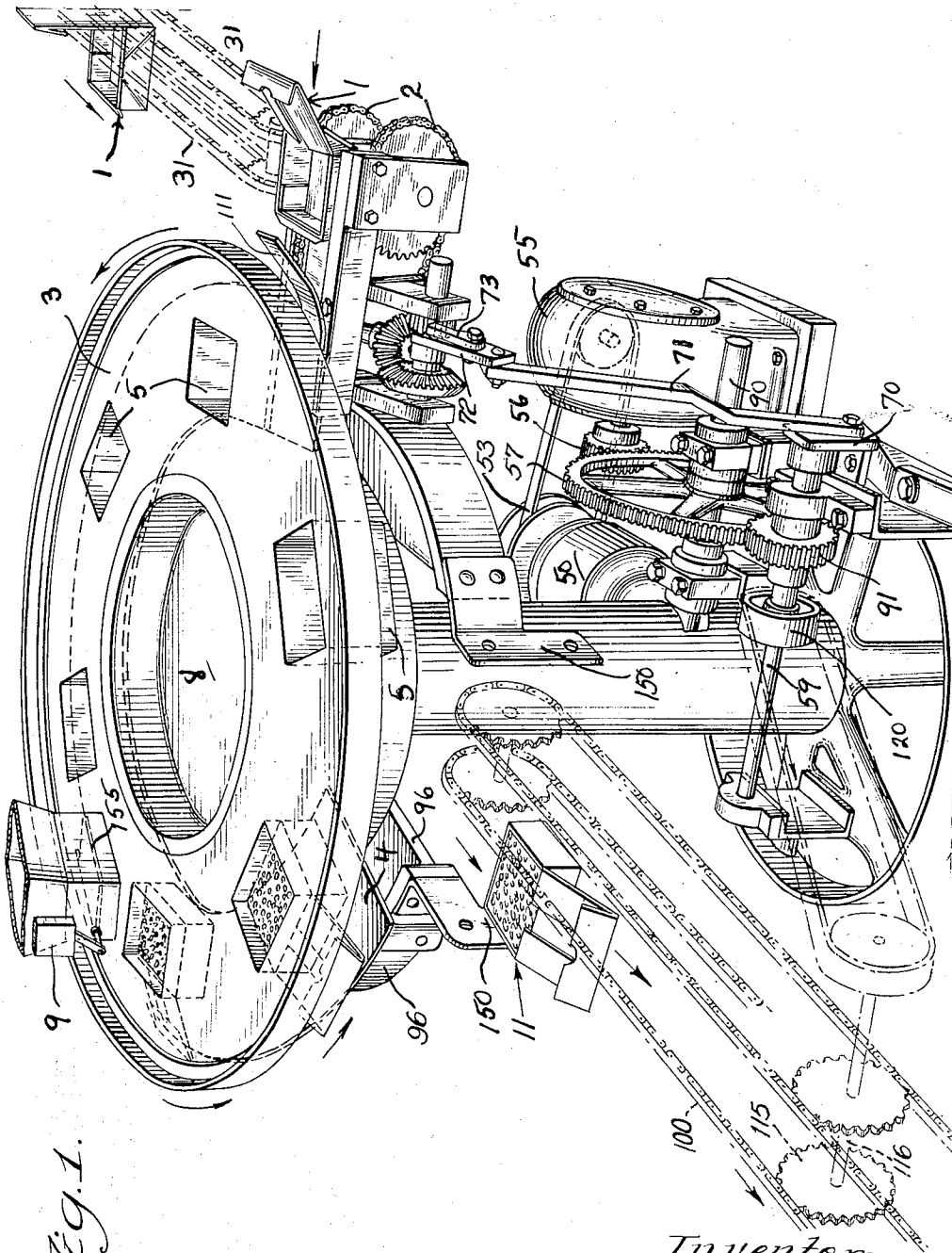
F. M. DEUTSCH ET AL

**2,567,598**

## METHOD AND APPARATUS FOR PACKAGING

Filed Nov. 24, 1945

11 Sheets-Sheet 1



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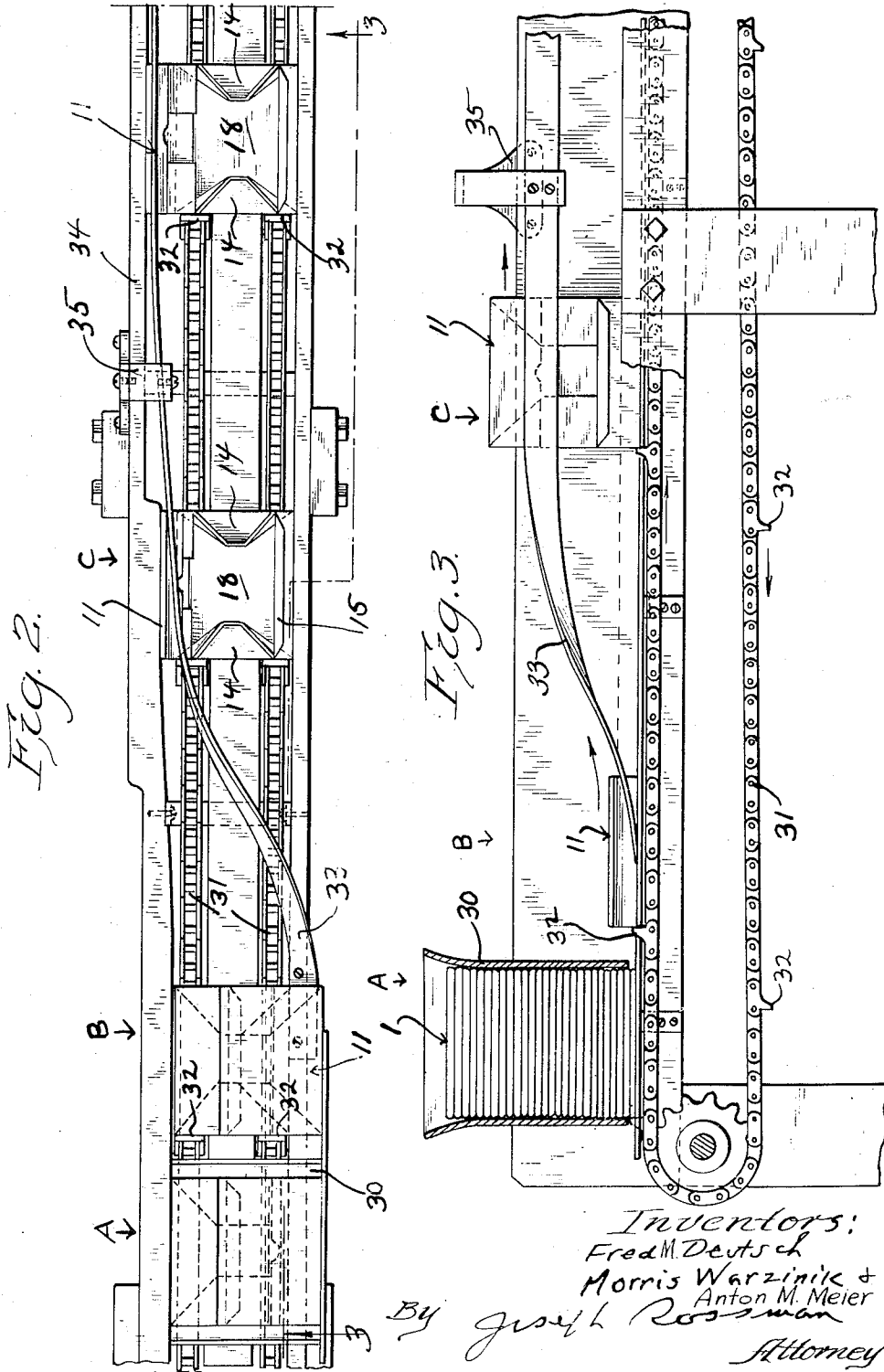
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METHOD AND APPARATUS FOR PACKAGING

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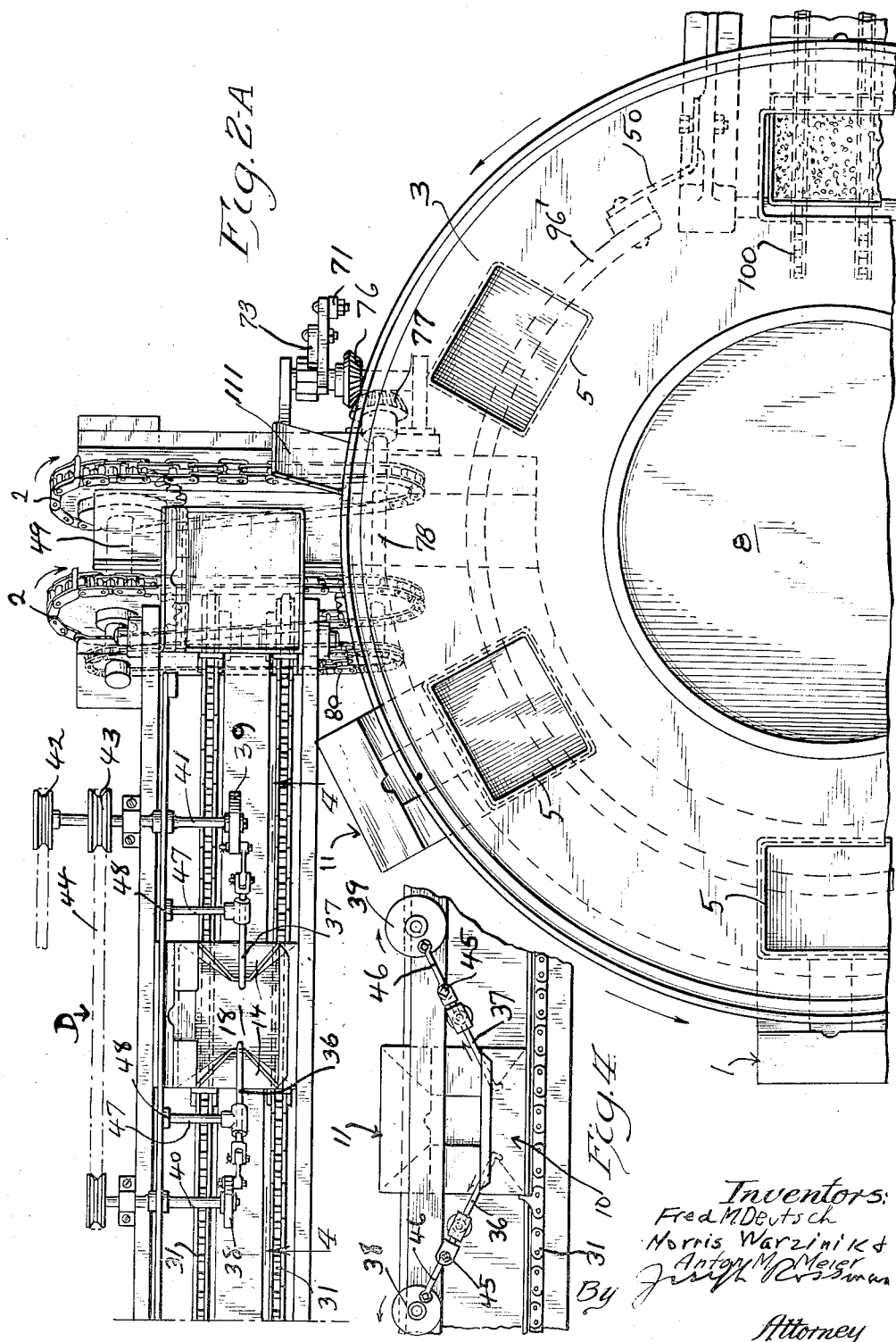
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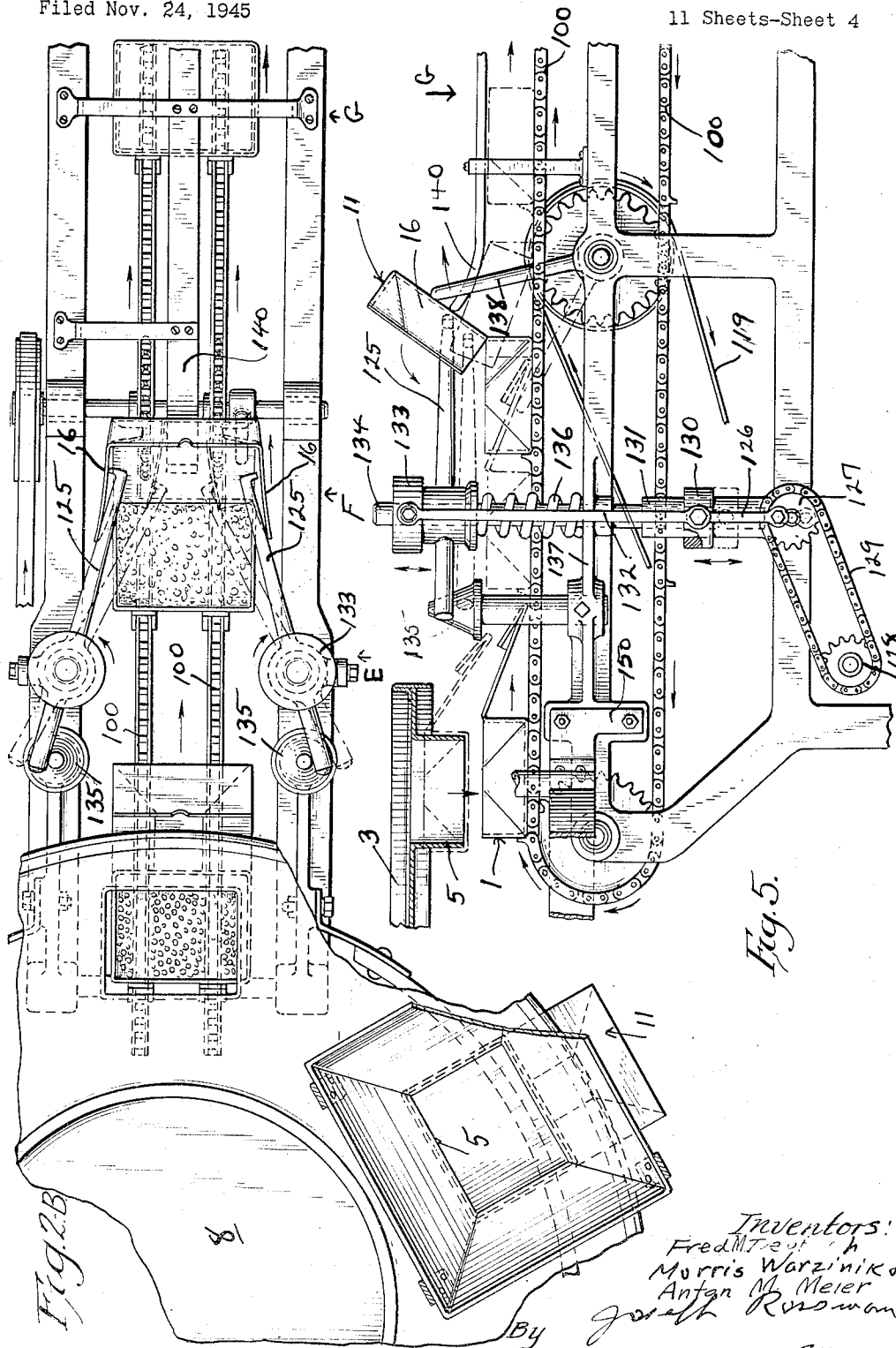


Fig. 5.

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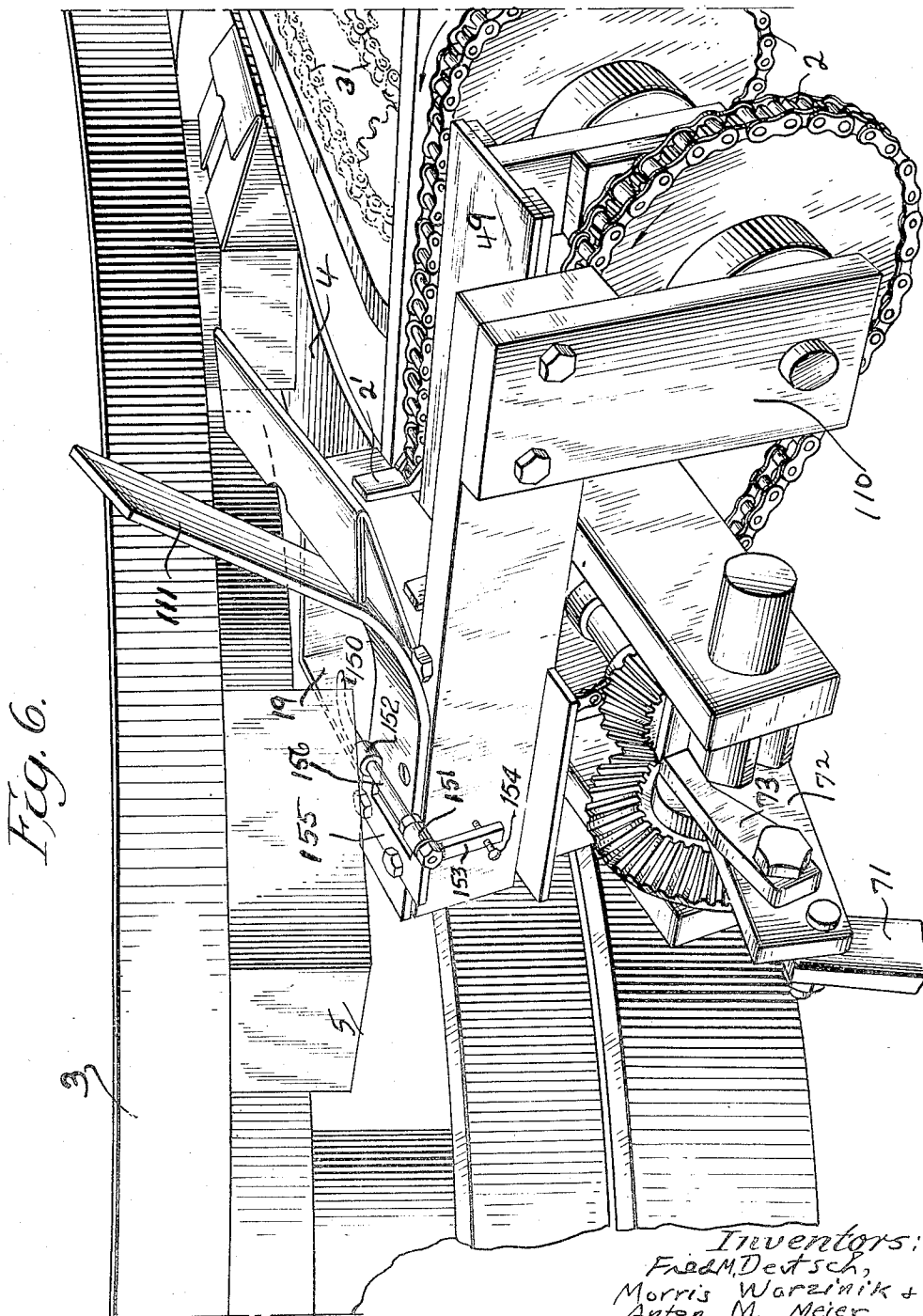
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## METHOD AND APPARATUS FOR PACKAGING

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## METHOD AND APPARATUS FOR PACKAGING

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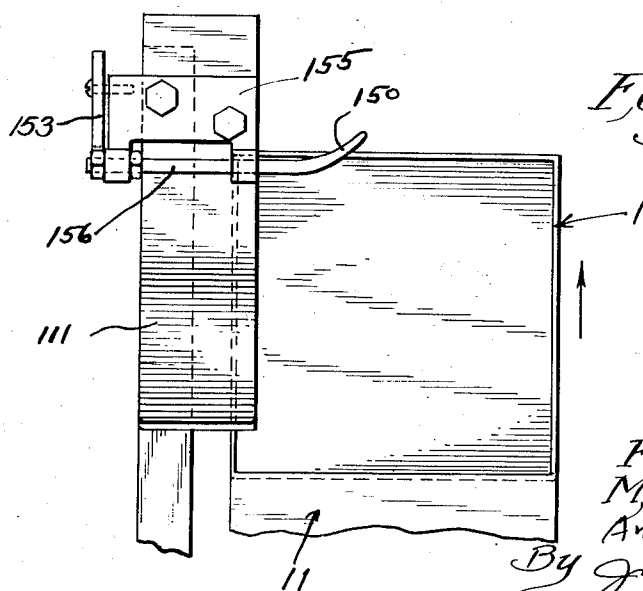
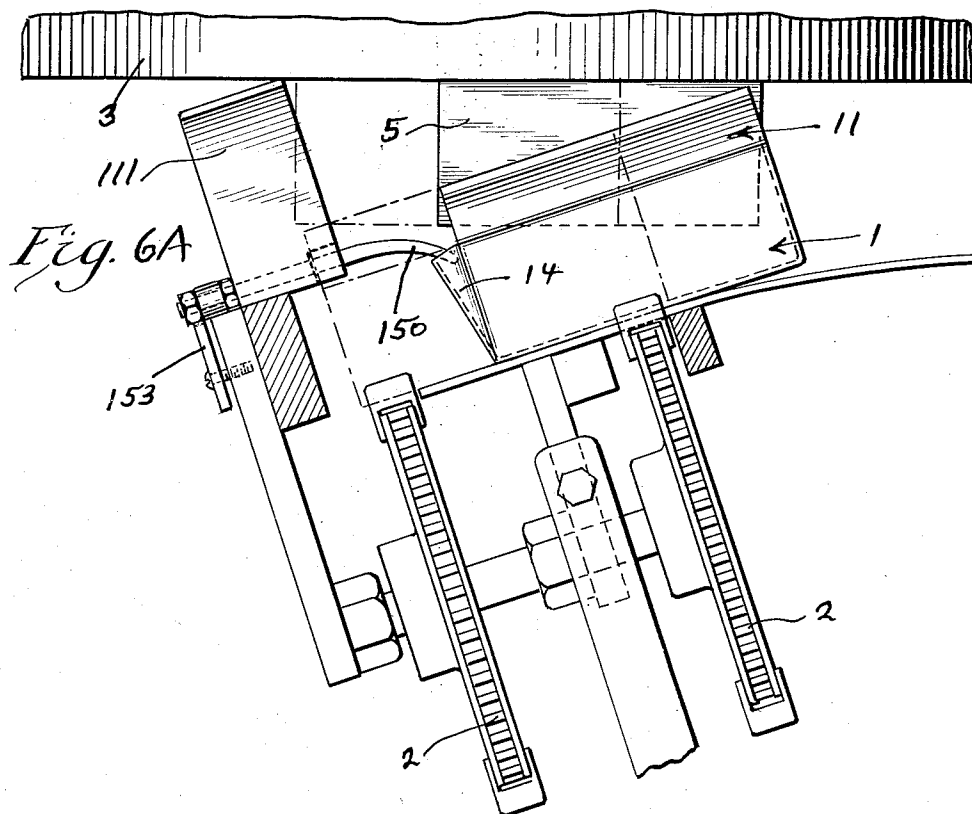


Fig. 6B

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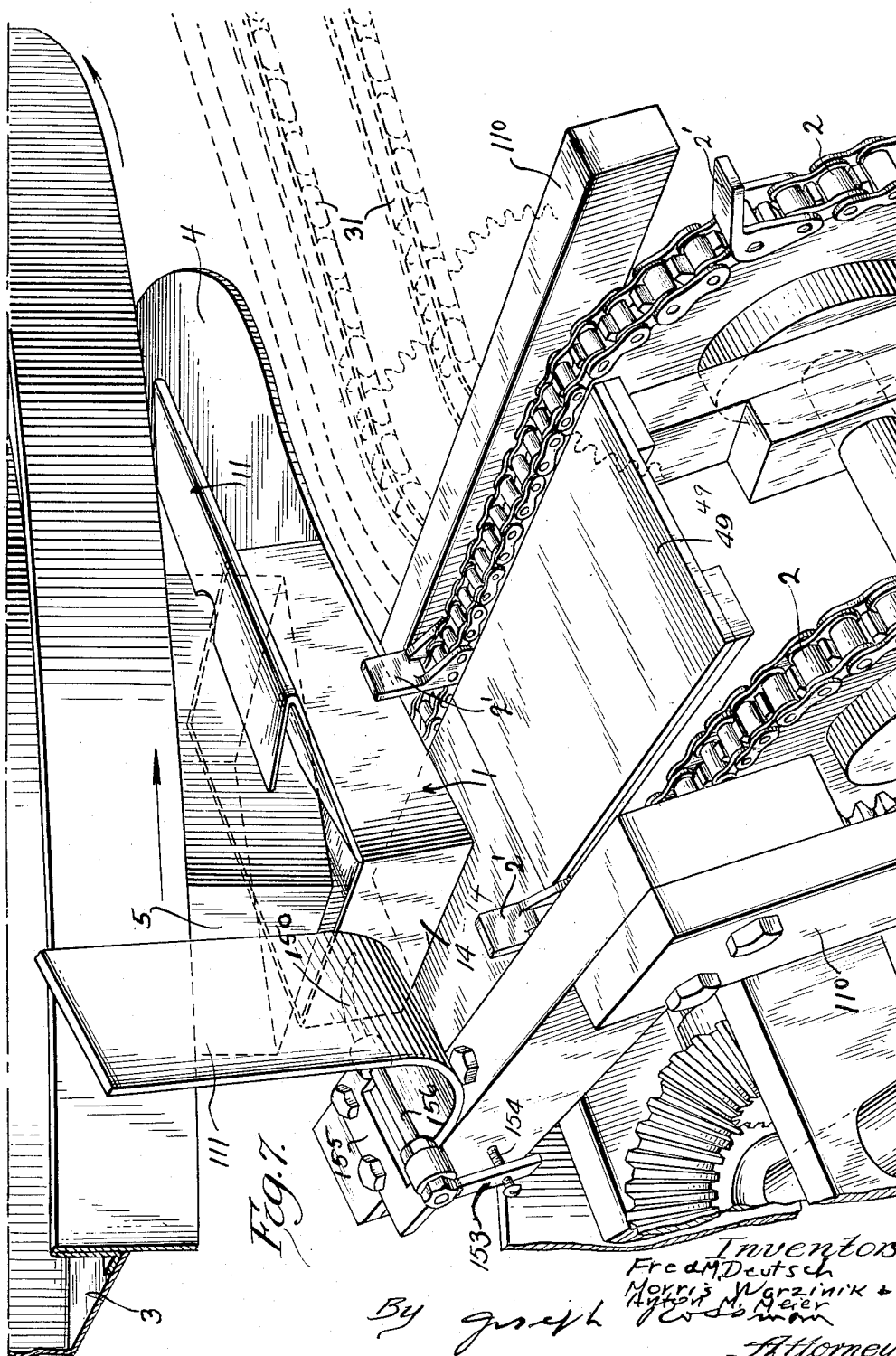
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## METHOD AND APPARATUS FOR PACKAGING

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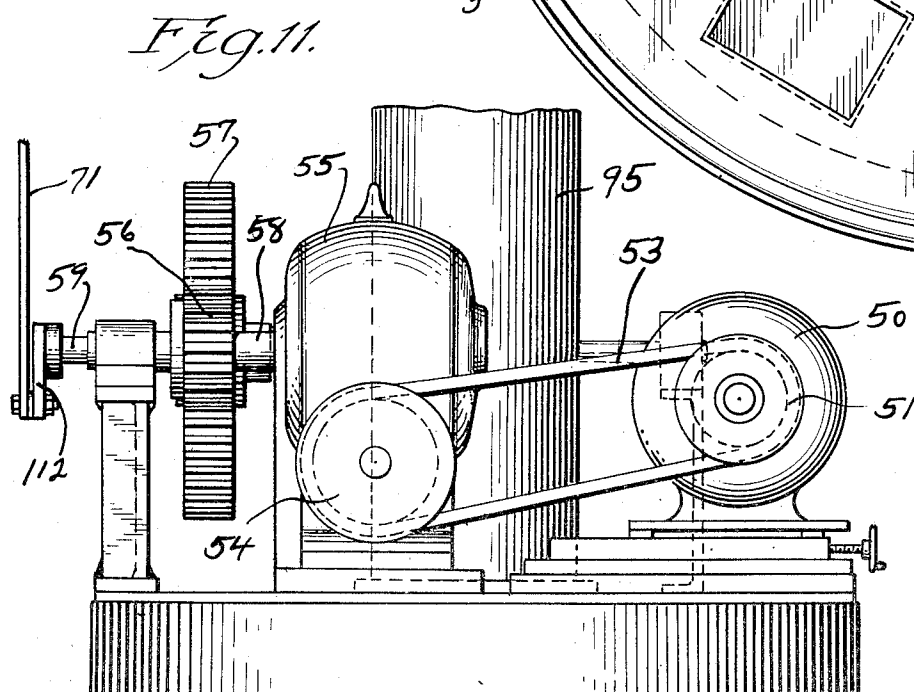
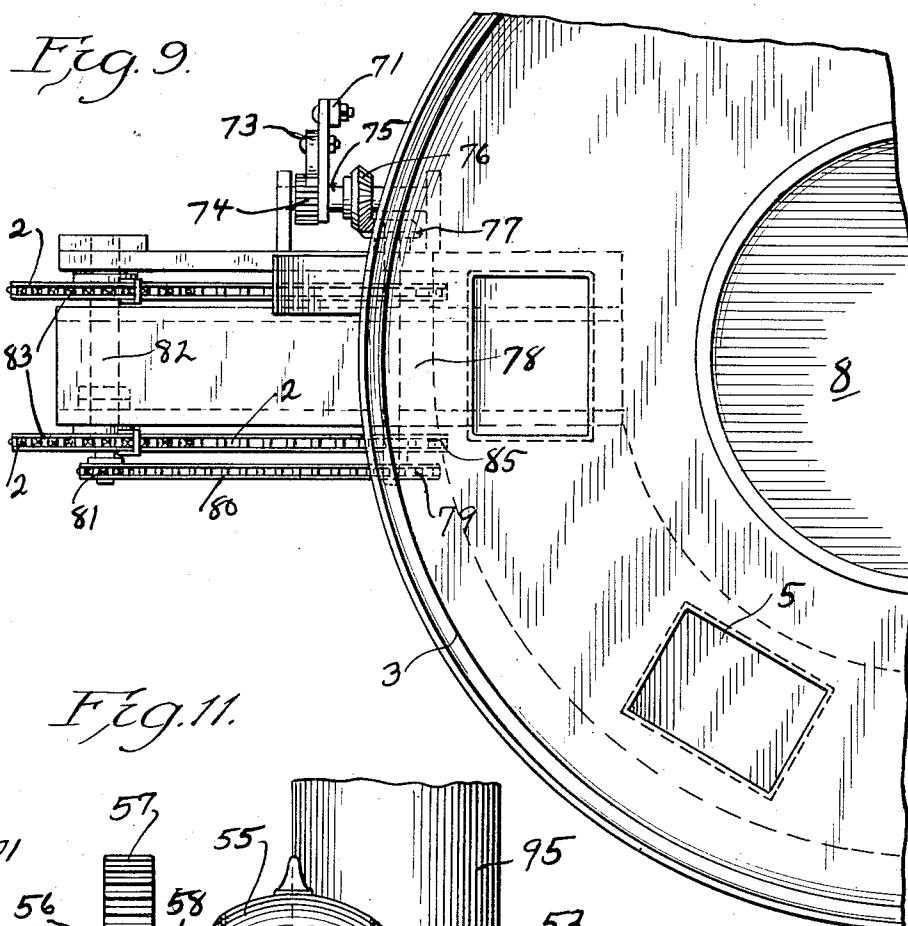
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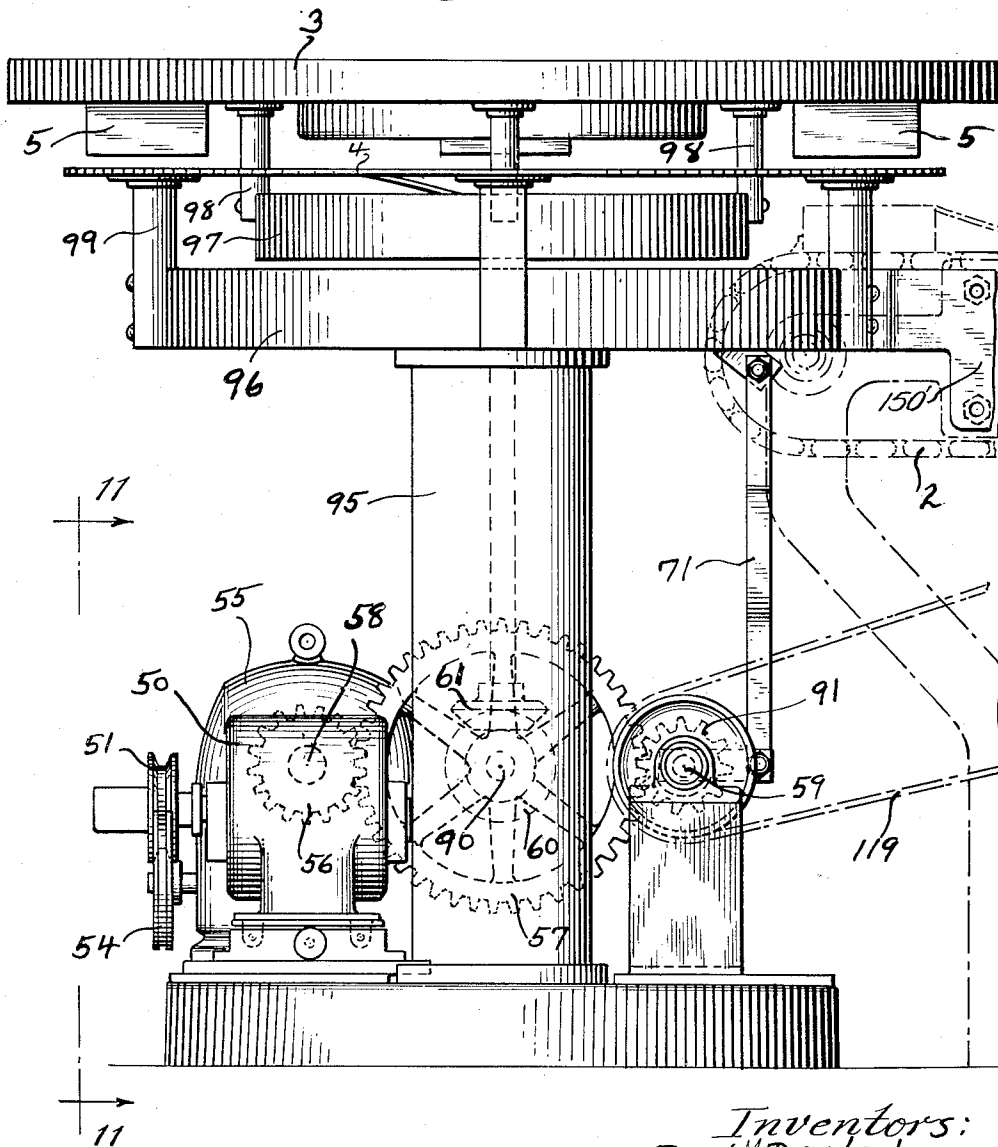
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Fig. 10.



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Fig. 13.

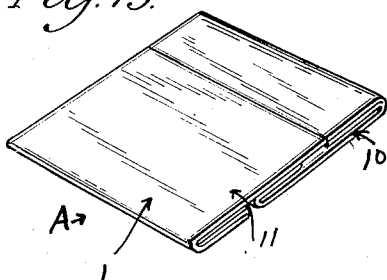
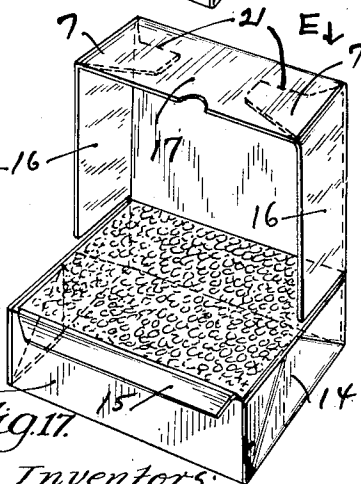
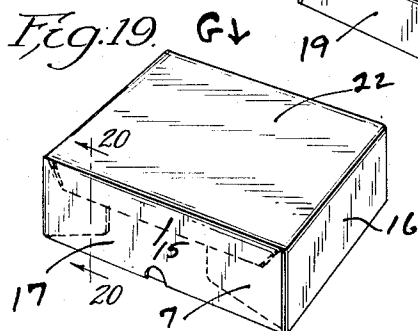
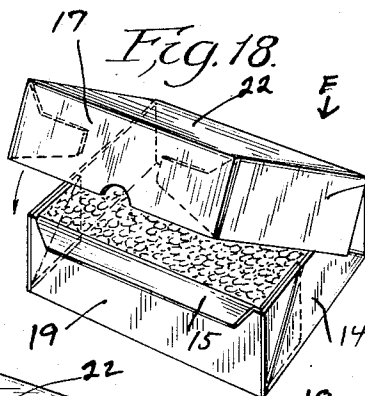
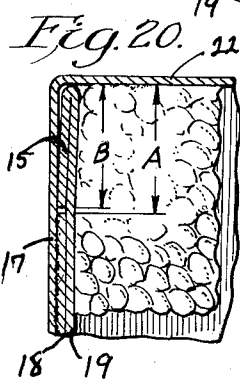
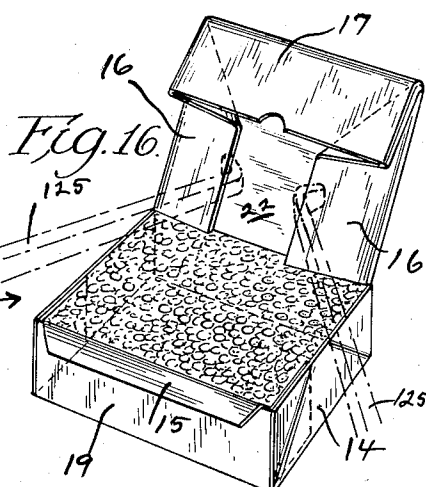
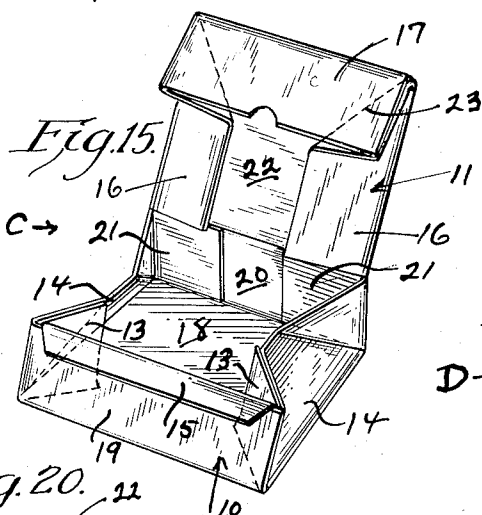
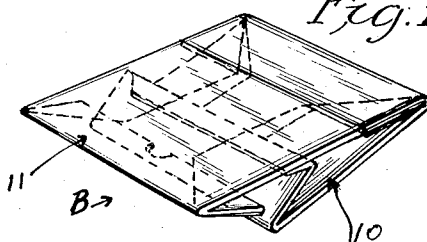


Fig. 14.



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## UNITED STATES PATENT OFFICE

2,567,598

## METHOD AND APPARATUS FOR PACKAGING

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Application November 24, 1945, Serial No. 630,628

35 Claims. (Cl. 93—6)

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This invention relates to a method and apparatus for packaging goods such as foods and the like. More specifically, the invention relates to packaging frozen or fresh foods in cartons by means of automatic equipment which is adapted to set up flat collapsed cartons, fill the cartons with the goods to be packaged, and close the filled cartons while they are being continuously conveyed. Further details and advantages of the invention will be apparent from the following specification and drawings wherein like numerals refer to like parts.

Figure 1 is a perspective view of the filling unit of the machine,

Figure 2 is a plan view of the conveyor for feeding the cartons and the carton set-up mechanism,

Figure 2A is a plan view continuation of Figure 2 showing the portion of the carton conveyor adjacent the filling unit for feeding the cartons,

Figure 2B is a plan view continuation of Figure 2A illustrating the carton cover closing means,

Figure 3 is a side view, partly in section, taken on lines 3—3 of Figure 2,

Figure 4 is a fragmental side view of the means for setting up the carton taken on lines 4—4 of Figure 2A,

Figure 5 is an enlarged fragmental side view of the means for engaging and closing the cover portion of the carton,

Figure 6 is an enlarged fragmental perspective view of the filling unit illustrating how the empty cartons are fed toward the filling unit,

Figure 6A is a fragmental elevational view illustrating a later stage of the carton as it is being fed into the filling unit,

Figure 6B is a fragmental plan view illustrating the carton as it is being fed into the feeding unit,

Figure 7 is a perspective view similar to Figure 6 showing the empty carton at a further advanced stage within the filling unit,

Figure 8 is a vertical sectional view of the filling unit,

Figure 9 is a fragmental plan view of the filling unit showing the intermittent carton feed in conveyor,

Figure 10 is an elevational view of the filling unit,

Figure 11 is a view of the motor drive of the feeding unit along lines 11—11 of Figure 10,

Figure 12 is a front view of the carton feed-in conveyor taken on lines 12—12 of Figure 8,

Figure 13 is a perspective view of a flat col-

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lapsed carton adapted to be handled by the foregoing apparatus,

Figure 14 is a similar view of the collapsed carton illustrating the inherent springiness of the cover portion,

Figure 15 is a perspective view of the partially set up carton,

Figure 16 is a perspective view of the carton having the tray portion filled with food such as peas,

Figure 17 is a perspective view of the same carton illustrating the cover in opened position,

Figure 18 is a perspective view of the same carton with the cover partially telescoped over the tray portion,

Figure 19 is a perspective view of the same carton fully closed, and

Figure 20 is an enlarged fragmental sectional view taken on lines 20—20 of Figure 19.

Hitherto it has been the common practice in packaging frozen foods, and the like, in cartons to perform all the packaging manually or with the aid of auxiliary equipment. The carton was set up by hand, then filled with the goods to be packaged manually, after which the cover was closed and the carton wrapped. All these manual operations require considerable manipulations, which are time consuming and entail costly labor. Furthermore, from the angle of cleanliness and sanitation it is very undesirable that the food or container be handled manually during packaging operations as the risk of contamination is ever present. According to the present invention, all the packaging operations are performed by fully automatic equipment so that at no time during the packaging operations are the containers or food touched by the hands of the operator.

The type of package made in accordance with the present invention is illustrated in Figures 13 to 17, the completed package being illustrated in Figure 19. The carton construction for making the package is disclosed and claimed in copending application, Serial No. 553,414, filed September 9, 1944, now U. S. Patent 2,437,835, March 16, 1948. The carton, indicated in general by numeral 1, is made from a single blank of cardboard, and the like, which is suitably cut, scored and glued to provide a set-up carton, as illustrated in Figure 15, having a tray or receptacle portion, indicated in general by numeral 10, and a telescoping cover portion, indicated in general by numeral 11, which is adapted to be closed over the tray portion after it is filled with goods 12 to be packaged. The tray portion 10 consists of

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a bottom wall 18, opposed foldable side walls 14, a front wall 19 and a rear wall 20. Beers-type flaps 13, hinged to front wall 19, are adhered to the adjacent side walls 14, and rear flaps 21, hinged to side walls 14, are adhered to rear wall 20. An abutment flap 15 is integrally hinged outwardly of front panel 19. The cover portion 11 is hinged to the upper edge of rear wall 20 and consists of a top cover panel 22 having opposed foldable side walls 16 and a front cover wall 17. The side walls 16 are folded along score lines 23 to permit collapsing of the cover in flat condition as shown in Figures 13 and 14. Side walls 16 of the cover are provided with integrally hinged abutment flaps 7 which are glued to the inside face of the front cover wall 17. Flaps 7 are cut out or recessed at 21 so as to provide abutment edges that are adapted to abut with the free abutment edge of abutment panel 15 when the cover is closed to assume the position shown in Figures 19 and 20 because the dimension A is slightly greater than the dimensions B as indicated in Figure 20. The hinged abutment panel 15 and flap 7 thus serve to releasably lock the cover 11 and retain it in closed position.

A stack of the flat collapsed flat cartons 1, in the flat folded condition as illustrated in Figure 13, is retained at station A in a holder or guide 30, shown in Figure 3, of any suitable construction having an open bottom from which the folded cartons are fed one at a time on a pair of spaced chain conveyors 31 provided with suitably spaced lugs 32. The cartons are positioned in the holder in the condition shown in Figure 13 so that the tray portion 10 faces downwardly and will be supported on the chain conveyors when fed thereon. The natural resiliency of the carton stock causes the tray portion to spring out slightly as shown in Figure 14. As the lugs 32 on chain 31 pass beneath the bottom of the holder 30 they engage a single carton and move it forward to the station B at which point the cover portion 11 is engaged by a stationary folding bar 33 which turns the cover to upstanding position at station C as illustrated in Figures 3 and 15. The bar 33 is suitably supported on frame 34 by an upwardly curved plate 35 so as to permit the carton to travel freely thereunder on the travelling pair of chains 31.

At the station D, as indicated in Figure 2A, a pair of oscillating arms 36 and 37 engage the opposed walls 14 of the carton so as to fully set up the tray portion in the condition shown in Figure 16. Arms 36 and 37 are eccentrically positioned on rotating discs 38 and 39, respectively, driven by shafts 40 and 41, respectively. Shaft 41 is driven by pulley 42. Shaft 40 is driven by pulley 43 on shaft 41 and belt 44. It will be noted that disc 39 is greater in diameter than disc 38 so that arm 37 will travel relatively faster than arm 36 in order to compensate for the motion of the carton at station D as it is travelling forward. The arms 36 and 37 engage the opposed walls 14 of the carton and position them at substantially right angles to the bottom wall 18 to assume the position shown in Figure 16. The Beers-type flaps 13 serve to retain the side walls 14 in fully set-up position after the carton is subjected to the setting up operation of arms 36 and 37 at station D. Arms 36 and 37 can be replaced by arms of different dimensions for proper engagement of the side walls 14 of the carton by removing pins 45 that connect the forked ends of arms 36 and 37 to connecting links 46 attached to the rotating discs 38 and 39.

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Guide rods 47 are provided on each of the arms 36 and 37 having their ends 48 slidable on bar 33. It is to be understood that any other suitable timed means may be utilized for engaging two opposed walls of the tray portion 10 of the carton for setting up the walls thereof in substantially right angular relation in position for receiving goods to be packaged therein.

The empty carton set up as previously described is then conveyed on chains 31 and dropped by gravity on a platform 49 having at each side thereof a pair of travelling chains 2, positioned at right angles to chains 31, as shown in Figures 2A, 6 and 7, positioned adjacent the filling unit. At this position the set up carton is fed into the feeding unit which functions to support and convey the carton therein while it is being filled with the goods to be packaged in the carton as will be described hereinafter in further detail.

The filling unit, as illustrated in Figure 1, consists of a rotating horizontally positioned table 3 having a fixed support 4 therebeneath for slidably supporting thereon the set-up cartons 1. The empty set-up cartons 1 are intermittently fed toward the rotating table 3 in timed relation thereto by a pair of suitably activated chains 2 which carry the carton by means of lugs 2' into position beneath the rotating table 3 to receive therein feeding sleeves 5 extending beneath the table 3. The platform 49 and chains 2 are tilted at an angle in relation to the horizontally positioned table 3, as shown in Figures 6 and 7, so that as the carton 1 travels toward the rotating table it will be in tilted position to receive the leading edge of the feeding sleeve 5, and as the table rotates further the sleeve 5 will fully enter within the tray portion 10 of the carton. The rotating table 3 may be provided with a depressed central portion 3 in which the food may be stored if desired for feeding through the upper open ends of the feeding sleeves 5 into the cartons or by an automatic measuring and feeding means indicated by numeral 9 located at a suitable position adjacent the rotating table 3 wherein a shutter 155 is automatically actuated in timed relation to the positioning of a carton therebeneath to deposit a measured amount of the material to be packaged in the carton. The filled cartons are then displaced from the filling unit and dropped on a pair of travelling chain conveyors 100 as shown in Figure 1. The filled cartons are then conveyed to a cover closing station to be described in detail hereinafter.

The drive mechanism for actuating the filling unit and conveying the empty cartons is illustrated in Figures 1 to 10. Motor 50, as shown in Figure 11, drives a gear reducer 55 through pulley 51, belt 53 and pulley 54. A gear 56 on the drive shaft 58 of the gear reducer meshes with gear 57 on shaft 90 as shown in Figure 10. Gear 57 in turn meshes with gear 91 on shaft 59 for actuating the conveyor mechanism through belt 119. Bevel gear 60 is fixed on shaft 90 and meshes with gear 61 on upright shaft 62 as shown in Figure 8. Shaft 62 is supported at its lower end in a thrust bearing 105. Shaft 62 and the gears 60 and 61 are enclosed in tubular housing standard 95. A fixed frame member consisting of a plate 96 and flange portion 96' is attached to the upper end of the standard 95 by flanges 106 and bolts 107. Flanges 150' are attached to the frame member 96 for attaching the conveyor frame thereto. A plurality of supporting legs 99 are in turn affixed to plate 96 which in turn fixedly support the carton supporting member 4. The

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shaft 62 extends through frame member 96 and is retained at its upper end by bushing 108. A circular member 97 is keyed to shaft 62 for rotation therewith. A plurality of spaced standards 98 are affixed to the rotating member 97 on which is supported the rotating table 3. It will thus be seen that rotation of shaft 62 will cause rotation of table 3 in relation to the fixed support 4. When the collar members 5 provided on table 3 enter the receptacle portion 10 of the carton they will carry the cartons therewith while the bottom panel 18 of the carton will slide on support 4. If desired the support 4 may be freely rotatable to eliminate frictional contact with the cartons, or if desired, support 4 may be positively driven.

The set-up empty cartons are intermittently fed to the filling unit by automatic timed mechanism illustrated in Figures 1, 2A, 6 to 9, and 12. The set-up empty cartons are conveyed as previously explained on the pair of spaced chains 31 and dropped on a platform 49, shown in Figures 6 and 7. The platform 49 is supported on frame members 110 which are inclined at about 45° from the vertical so that the cartons will travel on an inclined plane when the spaced lugs 2' on the travelling chains 2 move toward the filling unit in order to permit the collar members 5 to enter the tray portion 10 of the carton as previously explained. A deflector bar 111 is fixed on the frame member 110 to keep the cover portion 11 in its outwardly folded position. Chains 2 are intermittently actuated in timed relation to rotating table 3 by arm 71 which is oscillated by the crank 70 on shaft 59. Arm 71 is connected to arm 72 which carries a pawl 73 that engages ratchet 74 on shaft 75 as shown in Figure 9. Shaft 75 carries a bevel gear 76 which meshes with gear 77 on shaft 78. A sprocket 79 on shaft 78 impels chain 80 travelling over sprocket 81 on shaft 82. Shaft 82 carries a sprocket 83 as shown in Figure 8 which in turn engages with chains 2 that rides over sprockets 85 freely journaled on shaft 78. The intermittent motion of ratchet 74 thus causes chains 2 to move forward intermittently and to feed the cartons forward by contact therewith of lugs 2' on the chains.

As the empty carton 1 is moved forward by the lugs 2' the forward front wall 19 of the carton will contact a freely pivoted curved guide-finger 150 shown in Figure 6A which tends to assume the normal position shown in Figure 6A by action of gravity. The guide finger 150 is integral with bearing pin 156 which is freely rotatable in bearings 151 and 152 integral with plate 155 that is attached to the frame member. The free end of pin 156 is provided with a bar 153 having an adjustable stop screw 154. The stop screw is adapted to contact the extended portion of plate 155 when the bar 153 is swung upwardly. When the forward front wall 19 of the carton 1 contacts curved finger 150 it will cause the finger to rock to the position shown in Figure 6B to permit the carton to travel past the finger until the carton assumes the position shown in Figure 6. The finger 150 will then rock by gravity and assume its normal position as illustrated in Figure 6. The carton will then begin to travel in a circular path in the feeding unit at the moment the feeding sleeve 5 contacts the carton as previously explained. As the carton travels in the filling unit the trailing end wall 14 will engage the guide finger 150 as illustrated in Figure 6A which will tend to hold the carton back

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in a shoehorn-like effect so as to spread the side wall 14 outwardly slightly to a sufficient extent to permit the trailing edge of the sleeve 5 to readily enter the tray portion of the carton. The wall 14 being flexible will be automatically released from the finger 150 as the carton travels forward in a rotary path in the filling unit.

The cartons are continuously conveyed in the filling unit and filled during travel therein as previously explained. The filled cartons having the cover portion 11 open and folded back are displaced from the filling unit by simply dropping by gravity from the support 4 onto a pair of travelling chains 100 as shown in Figure 1 moving in the direction of the arrows. These chains are driven by sprockets 115 on shaft 116 having a pulley 117 thereon. Pulley 117 is driven by belt 119 passing over pulley 117 and pulley 120 on shaft 59 as previously explained.

In order to close the cover portion 11 of the cover automatic timed means are provided at station E adjacent the travelling chains 100 as illustrated in Figures 2B and 5. For this purpose two oscillating arms 125 are provided which are adapted to engage the opposed side walls 16 in the manner illustrated by the dotted lines of Figure 16. The arms 125 spread apart the opposed walls 16 of the cover to assume the position shown in Figure 17 at station F so that as the cover is folded over it will telescope over the tray portion 10 of the carton to assume the position shown in Figure 18 and then at station G the final locked position shown in Figure 19. The arms 125 are actuated by an oscillating link 126 which is eccentrically attached at its lower end to sprocket 127 driven by chain 129 passing over a sprocket 128. Link 126 is attached to a sleeve 130 slidable on guide bar 131. Another link 132 is affixed to sleeve 130 for oscillation therewith. The upper end of link 132 is affixed to a collar portion 133 slidable on guide post 134. Collar 133 carries an arm 125. The forward end of arm 125 is adapted to engage the side wall 16 of the cover. The rear end of arm 125 rides on a conical cam surface 135 so that arm 125 will have an oscillating motion as indicated by the dotted lines in Figure 2B as well as an up and down motion suitable for engaging the side walls of the carton cover. A spring 136 is provided between the collar portion 133 and frame member 137 to ensure return of link 132 to normal position. As the carton travels forward while on chains 100 the cover will encounter rotating arm 138 that moves in the direction of the arrow from the dotted line position shown in Figure 5 to lift the cover 11 upwardly as shown in solid lines in Figure 5. At this point the cover will engage a fixed bar 140 which contacts the outer face of the cover panel 22 so as to cause the cover to telescope over the tray portion 10. As shown in Figure 5, the bar 140 is inclined slightly upwardly at its free end to permit the closed carton to pass thereunder. The bar 140 is spaced above the conveyor chains 100 a sufficient distance to permit the cover to assume a fully closed position at station G so as to lock the cover by the abutting action of locking flaps 15 and 7 of the carton as previously explained. The fully closed carton may then be conveyed to a wrapping unit for enclosing the carton in an outer wrapper from whence the packages are packed in shipping cases.

Summarizing, the sequence of steps in carrying out our packaging methods includes the steps of feeding a series of individually folded collapsed

cartons one at a time from a stack of such cartons as shown in Figure 3. One carton at a time is fed on a pair of travelling conveyor chains 31 which convey the cartons to a cover raising station C as shown in Figures 2 and 3. The tray portion 10 of the carton is then set up at station D as shown in Figure 2A. The set-up empty cartons are then fed one at a time to a rotating filling table 3 as shown in Figure 1 on a pair of conveyor chains 2. As the carton enters beneath the filling table 3 a feed sleeve 5 enters within the tray portion of the carton and moves the carton with it so that it can be filled through the upper open end of the sleeve in any suitable manner while travelling with the rotating table. As shown in Figure 1 the cartons may be filled by a suitable automatic measuring and filling device 9, or if desired the cartons may be filled by hand by packing any goods kept in the central depressed portion 8 of the rotating table. The filled cartons having their cover portions in opened position are then ejected on a pair of travelling conveyor chains 100 as shown in Figure 1 and brought to the cover closing stations E and F as shown in Figures 2B and 5 where the opposed side walls of the cover are spread apart and then telescoped over the tray portion at station G by deflector bar 140, so as to completely close the carton in the final condition illustrated in Figure 19. The closed cartons may then be further handled in any suitable manner. They may be wrapped by means of any conventional wrapping apparatus and then packed in shipping cases.

The present invention is not necessarily restricted to the specific embodiment of the apparatus illustrated in the drawings. Obviously the procedure in mechanically setting up the folded cartons, filling them and closing the cover may be carried out by other apparatus performing the equivalent operations in the same order or sequence of steps which is an important feature of this invention. It is therefore intended to include within the scope of the following claims the essential novel features of the present invention as broadly defined therein. Although the present invention is especially adapted for packaging frozen foods it is well adapted for packaging any other articles in the same type of carton.

We claim:

1. The method of packaging which comprises the steps of providing a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, feeding a series of successive individual cartons from said stack, successively setting up the individual cartons by folding the cover portion of a carton away from the tray portion, opening and setting up the tray portion, filling said tray portion with goods to be packaged therein, and then automatically telescoping said cover portion over said tray portion in closed relation thereto.

2. The method of packaging which comprises the steps of providing a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion and cooperating locking means provided on said tray portion and cover portion for releasably locking said two portions in closed position, feeding a series of successive individual cartons from said stack, setting up the individual cartons by folding the cover portion thereof upwardly of said tray portion, opening and setting up the tray portion of said carton, filling said tray portion

with goods to be packaged therein, telescoping said cover portion over said tray portion and bringing the locking means of said tray and cover portions into locking engagement.

3. The method of packaging which comprises the steps of providing a stack of collapsible folded cartons folded in substantially flat condition having a collapsed tray portion and a collapsed cover portion adapted to telescope over said tray portion hinged thereto and folded thereupon, feeding a series of successive individual cartons from said stack, folding the cover portion upwardly relative to said tray portion of the individual cartons, moving at least two opposed walls of the tray portion to set up the tray portion, filling said tray portion with goods to be packaged, moving at least two opposed wall portions of said cover portion to open same, telescoping said cover over said tray portion and folding said cover in closed position over said tray portion.

4. The method of packaging which comprises the steps of providing a stack of collapsed cartons folded in substantially flat condition having a collapsed tray portion and a hinged cover portion, feeding a spaced series of individual cartons from the bottom of said stack on a moving conveyor, the tray portion of said cartons being in supported contact on said conveyor, successively folding said cover portions upwardly of said tray portions while travelling on said conveyor, setting up the said tray portions while travelling on said conveyor, filling said tray portions with goods to be packaged, spreading said cover portions apart to permit telescoping said cover over said tray portions and closing said covers to complete the package.

5. The method of packaging which comprises the steps of providing a stack of collapsed cartons folded in substantially flat condition having a collapsed tray portion and a cover portion hinged thereto and folded thereover, feeding a series of said collapsed cartons in spaced succession on a travelling conveyor, the tray portion being in supported contact on said conveyor, folding said cover portion upwardly of said tray portion while the cartons are moved by said conveyor, setting up the said tray portion, moving said set-up cartons to a feeding station, filling said tray portion with goods to be packaged therein, opening said cover portion to permit telescoping same over said tray portion and closing said cover over the tray portion to complete the package.

6. The method of packaging which comprises the steps of providing a stack of collapsed cartons folded in substantially flat condition having a collapsed tray portion and a cover portion hinged thereto and folded thereover, continuously feeding a series of said collapsed cartons from said stack in a spaced straight line relation, continuously moving said cartons while so spaced apart, folding said cover portion upwardly in relation to said tray portion, moving at least two opposed walls of said tray portion away from each other to set up said tray portion, filling said tray portion with goods to be packaged, moving at least two opposed wall portions of said cover portion outwardly, telescoping said cover over said tray portion and folding said cover in closed position over said tray portion.

7. The method of packaging which comprises the steps of providing a stack of collapsed cartons having a folded tray portion and a cover portion hinged thereto, continuously feeding a

series of said collapsed cartons from said stack in spaced succession in a straight line path of travel, successively setting up the tray portions of said travelling cartons, then conveying said cartons in a path intersecting said path of travel toward a feeding station, moving said cartons in a substantially circular path at said feeding station, filling said tray portion with foods to be packaged while at said feeding station, displacing the filled cartons from said feeding station, conveying said filled cartons away from said feeding station in a straight line path in a spaced series, and closing said cover portion on said tray portion to complete the package.

8. Packaging apparatus comprising means for retaining a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, means for feeding individual cartons from said stack, means for folding the cover portion of the individual cartons upwardly of said tray portion, means for opening and setting up said tray portion, means for filling said tray portion with goods to be packaged therein, and means for folding said cover over said tray portion.

9. Packaging apparatus comprising means for retaining a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, means for feeding individual cartons from said stack, means for folding the cover portion of the individual cartons upwardly of said tray portion, means for engaging at least two opposed side walls of said tray portion to set up said tray portion, means for filling said tray portion with goods to be packaged therein, means for engaging at least two opposed side walls of said cover portion to open said cover, means for telescoping said cover while said opposed side walls are in spread apart condition and folding same over said tray portion to close the carton.

10. Packaging apparatus comprising means for retaining a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, means for feeding a spaced series of said cartons on a travelling conveyor, means on said conveyor for retaining said cartons in spaced relation, means for successively folding said cover portions upwardly while the cartons are travelling on said conveyor, means for setting up the tray portions while travelling on said conveyors, means for filling said tray portions with goods to be packaged therein, means for spreading apart the side walls of said cover portions and means for telescoping said covers over said tray portions and closing the cartons.

11. Packaging apparatus comprising means for retaining a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, means for continuously feeding a series of said collapsed cartons from said stack in spaced succession in a straight line of travel, means for successively setting up the tray portions of said travelling cartons, means for conveying said set-up cartons one at a time to a filling means, means for filling the tray portions with a predetermined amount of goods to be packaged, means for displacing the filled cartons from said filling means, means for telescoping and closing the cover over said tray portion.

12. Packaging apparatus comprising means for retaining a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, a holder for re-

taining a stack of said collapsed cartons, said holder being open at the bottom thereof to permit ejection of a single carton therefrom at a time, a pair of spaced travelling chains reaching beneath said carton holder, spaced lugs on said chains for ejecting said cartons from said holder and carrying the cartons forward in a spaced series, a folding bar adjacent the bottom of said holder and curving upwardly therefrom for engaging the cover portion of said carton and to fold same upwardly of the tray portion, a pair of oscillating arms positioned beyond the curved portion of said folding bar for engaging two opposed side walls of said tray portion for setting same up, a second pair of travelling chains positioned at the end travel of said first pair of chains and at right angles thereto, said second conveyor chains being actuated in timed relation to feed one carton at a time to a rotating filling table, a series of spaced filling sleeves on said table adapted for insertion into the tray portion of said cartons, a support beneath said rotating table for slidably supporting the cartons thereon while being moved by said inserted filling sleeves, means for automatically filling said tray portion with a predetermined amount of goods to be packaged therein, a third pair of spaced conveyor chains for receiving the filled cartons displaced from said rotating table, a pair of oscillating arms adjacent said third pair of conveyor chains for spreading two opposed side walls of said cover portion for telescoping same over the tray portion, a stationary bar positioned beyond said oscillating arms for contacting the outer face of said cover portion and folding same over the tray portion while the carton is being conveyed.

13. Packaging apparatus comprising means for retaining a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, a holder for retaining a stack of said collapsed cartons, said holder being open at the bottom thereof to permit ejection of a single carton therefrom at a time, a pair of spaced travelling chains reaching beneath said carton holder, spaced lugs on said chains for ejecting said cartons from said holder and carrying the cartons forward in a spaced series, a folding bar adjacent the bottom of said holder and curving upwardly therefrom for engaging the cover portion of said carton and to fold same upwardly of the tray portion, a pair of oscillating arms positioned beyond the curved portion of said folding bar for engaging two opposed side walls of said tray portion for setting same up, a second pair of travelling chains positioned at the end travel of said first pair of chains and at right angles thereto, said second conveyor chains being actuated in timed relation to feed one carton at a time to a rotating filling table, a series of spaced filling sleeves on said table adapted for insertion into the tray portion of said cartons, said second conveyor chains being positioned at an angle to said rotating filling table to permit successive insertion of the leading edge of said filling sleeves within the tray portions, a support beneath said rotating table for slidably supporting the cartons thereon while being moved by said inserted filling sleeves, means for automatically filling said tray portion with a predetermined amount of goods to be packaged therein, a third pair of spaced conveyor chains for receiving the filled cartons displaced from said rotating table, a pair of oscillating arms adjacent said third pair of conveyor



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chains for spreading two opposed side walls of said cover portion for telescoping same over the tray portion, a stationary bar positioned beyond said oscillating arms for contacting the outer face of said cover portion and folding same over the tray portion while the carton is being conveyed.

14. Packaging apparatus comprising means for retaining a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, a holder for retaining a stack of said collapsed cartons, said holder being open at the bottom thereof to permit ejection of a single carton therefrom at a time, a pair of spaced travelling chains reaching beneath said carton holder, spaced lugs on said chains for ejecting said cartons from said holder and carrying the cartons forward in a spaced series, a folding bar adjacent the bottom of said holder and curving upwardly therefrom for engaging the cover portion of said carton and to fold same upwardly of the tray portion, a pair of oscillating arms positioned beyond the curved portion of said folding bar for engaging two opposed side walls of said tray portion for setting same up, a second pair of travelling chains positioned at the end travel of said first pair of chains and at right angles thereto, said second conveyor chains being actuated in timed relation to feed one carton at a time to a rotating filling table, a series of spaced filling sleeves on said table adapted for insertion into the tray portion of said cartons, said second conveyor chains being positioned at an angle to said rotating filling table to permit successive insertion of the leading edge of said filling sleeves within the tray portions, a support beneath said rotating table for slidably supporting the cartons thereon while being moved by said inserted filling sleeves, means for automatically filling said tray portion with a predetermined amount of goods to be packaged therein, a third pair of spaced conveyor chains for receiving the filled cartons displaced from said rotating table, means for raising the cover portion upwardly, a pair of oscillating arms adjacent said third pair of conveyor chains for spreading the two opposed side walls of said cover portion for telescoping same over the tray portion, a stationary bar positioned beyond said oscillating arms for contacting the outer face of said cover portion and folding same over the tray portion while the carton is being conveyed.

15. Packaging apparatus comprising means for retaining a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, means for continuously feeding a series of said collapsed cartons from said stack in spaced succession in a straight line of travel, means for successively setting up the tray portions of said travelling cartons, means for conveying said set-up cartons one at a time to a filling means, means for inserting a filling sleeve within the tray portion, means for filling the tray portions with a predetermined amount of goods to be packaged through said filling sleeve, means for displacing the filled cartons from said filling means, means for telescoping and closing the cover over said tray portion.

16. Packaging apparatus comprising means for retaining a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, a holder for retaining a stack of said collapsed cartons, said holder being open at the bottom thereof to per-

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mit ejection of a single carton therefrom at a time, a pair of spaced travelling chains reaching beneath said carton holder, spaced lugs on said chains for ejecting said cartons from said holder and carrying the cartons forward in a spaced series, a folding bar adjacent the bottom of said holder and curving upwardly therefrom for engaging the cover portion of said carton and to fold same upwardly of the tray portion, a pair of oscillating arms positioned beyond the curved portion of said folding bar for engaging two opposed side walls of said tray portion for setting same up, a second pair of travelling chains positioned at the end travel of said first pair of chains and at right angles thereto, said second conveyor chains being actuated in timed relation to feed one carton at a time to a rotating filling table, a series of spaced filling sleeves on said table adapted for insertion into the tray portion of said cartons, means for guiding the empty carton at an angle in relation to said filling sleeves for facilitating insertion of said filling sleeve in said tray portion, a support beneath said rotating table for slidably supporting the cartons thereon while being moved by said inserted filling sleeves, means for automatically filling said tray portion with a predetermined amount of goods to be packaged therein through said filling sleeves, a third pair of spaced conveyor chains for receiving the filled cartons displaced from said rotating table, a pair of oscillating arms adjacent said third pair of conveyor chains for spreading two opposed side walls of said cover portion for telescoping same over the tray portion, a stationary bar positioned beyond said oscillating arms for contacting the outer face of said cover portion and folding same over the tray portion while the carton is being conveyed.

17. Packaging apparatus comprising means for retaining a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, a holder for retaining a stack of said collapsed cartons, said holder being open at the bottom thereof to permit ejection of a single carton therefrom at a time, a pair of spaced travelling chains reaching beneath said carton holder, spaced lugs on said chains for ejecting said cartons from said holder and carrying the cartons forward in a spaced series, a folding bar adjacent the bottom of said holder and curving upwardly therefrom for engaging the cover portion of said carton and to fold same upwardly of the tray portion, a pair of oscillating arms positioned beyond the curved portion of said folding bar for engaging two opposed side walls of said tray portion for setting same up, a second pair of travelling chains positioned at the end travel of said first pair of chains and at right angles thereto, said second conveyor chains being actuated in timed relation to feed one carton at a time to a rotating filling table, a series of spaced filling sleeves on said table adapted for insertion into the tray portion of said cartons, means for guiding the empty carton at an angle in relation to said filling sleeves for facilitating insertion of said filling sleeve in said tray portion, means for spreading outwardly at least one end wall of said tray portion to facilitate insertion of said filling sleeve therein, a support beneath said rotating table for slidably supporting the cartons thereon while being moved by said inserted filling sleeves, means for automatically filling said tray portion with a predetermined amount of goods to be packaged there-

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in through said filling sleeves, a third pair of spaced conveyor chains for receiving the filled cartons displaced from said rotating table, a pair of oscillating arms adjacent said third pair of conveyor chains for spreading two opposed side walls of said cover portion for telescoping same over the tray portion, a stationary bar positioned beyond said oscillating arms for contacting the outer face of said cover portion and folding same over the tray portion while the carton is being conveyed.

18. Packaging apparatus comprising means for retaining a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, a holder for retaining a stack of said collapsed cartons, said holder being open at the bottom thereof to permit ejection of a single carton therefrom at a time, a pair of spaced travelling chains reaching beneath said carton holder, spaced lugs on said chains for ejecting said cartons from said holder and carrying the cartons forward in a spaced series, a folding bar adjacent the bottom of said holder and curving upwardly therefrom for engaging the cover portion of said carton and to fold same upwardly of the tray portion, a pair of oscillating arms positioned beyond the curved portion of said folding bar for engaging two opposed side walls of said tray portion for setting same up, a second pair of travelling chains positioned at the end travel of said first pair of chains and at right angles thereto, said second conveyor chains being actuated in timed relation to feed one carton at a time to a rotating filling table, a series of spaced filling sleeves on said table adapted for insertion into the tray portion of said cartons, means for guiding the empty carton at an angle in relation to said filling sleeves for facilitating insertion of said filling sleeve in said tray portion, a freely pivoted gravity-positioned guide finger adapted to engage and temporarily restrain the trailing end of the tray portion to facilitate insertion of said filling sleeve in said tray portion, a support beneath said rotating table for slidably supporting the cartons thereon while being moved by said inserted filling sleeves, means for automatically filling said tray portion with a predetermined amount of goods to be packaged therein through said filling sleeves, a third pair of spaced conveyor chains for receiving the filled carton displaced from said rotating table, a pair of oscillating arms adjacent said third pair of conveyor chains for spreading two opposed side walls of said cover portion for telescoping same over the tray portion, a stationary bar positioned beyond said oscillating arms for contacting the outer face of said cover portion and folding same over the tray portion while the carton is being conveyed.

19. Packaging apparatus comprising means for retaining a stack of collapsed cartons folded in substantially flat condition having a tray portion and a hinged cover portion, means for continuously feeding a series of said collapsed cartons from said stack in spaced succession in a straight line of travel, means for successively setting up the tray portions of said travelling cartons, means for conveying said set-up cartons one at a time to a filling means, means for inserting a filling sleeve within the tray portion, means for spreading the tray portion momentarily to permit insertion of said filling sleeve, means for filling the tray portions with a predetermined amount of goods to be packaged through said filling sleeve, means for displacing the filled

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cartons from said filling means, means for telescoping and closing the cover over said tray portion.

20. A method of forming, filling, and closing a one piece carton in uninterrupted flow, said carton having a body portion comprising a rectangular bottom and hinged side walls around the perimeter thereof, a cover hinged to the outer edge of one of said side walls and being formed along its opposite edges with a continuous hinged flange adapted to overlap the sides of the body member, which method comprises placing said carton within a magazine and disposed with the bottom wall horizontal and lowermost, thereafter feeding the carton onto a conveyor system whereby the hinge of the cover will extend parallel to the path of travel of the carton, thereafter blocking the body portion of the carton to form a container and erecting the cover at the side thereof, then conveying the carton to a filling station at which a measured quantity of material will be deposited in the carton as the carton moves in uninterrupted flow, then removing the carton from the filling station while carried by the conveyor system and with the carton disposed with its cover hinged normal to the path of travel of the carton, then engaging the flange of the cover to spread the same to an unfolded position, and thereafter folding the cover downwardly to a closed position over the carton body with the flange of the cover disposed in overlapping relation to the side walls of the carton body.

21. A machine for forming, filling, and closing cartons moving in continuous and uninterrupted flow through the machine, each of said cartons comprising a rectangular body formed by a bottom and side and end walls hinged thereto and to each other and a cover hinged to one edge of a wall of the carton body and having a continuous flange hinged on the free edges of the cover, said cartons being collapsed with the side and end walls of the carton body folded flat over the bottom thereof and with the flange folded flat under the cover and the cover folded over the body of the carton and disposed in substantially the plane of the bottom of the carton, which comprises a magazine for receiving a stack of said cartons in collapsed and folded condition and with the bottoms of the cartons presented downwardly, a continuous conveyor provided with means for removing the cartons successively from the magazine and for conveying the cartons in spaced relation and in a single file past a carton opening, filling, and closing station, means at the opening station for opening the cover of the cartons during their uninterrupted travel to expose the body of the cartons and for blocking the body of the cartons during their uninterrupted travel along said conveyor, means at the filling station for depositing a measured quantity of product into the cartons as they proceed in uninterrupted flow, means at the closing station for opening the flange of the cover of the cartons and for closing the cover upon the filled cartons with the flange disposed in overlapping relation with respect to the walls of the carton body, and synchronous driving means for the conveyor, the opening means, the filling means, and the carton closing means.

22. A machine for forming, filling, and closing cartons moving in continuous and uninterrupted flow through the machine, each of said cartons

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comprising a rectangular body formed by a bottom and side and end walls hinged thereto and to each other and a cover hinged to one edge of a wall of the carton body and having a continuous flange hinged on the free edges of the cover, said cartons being collapsed with the side and end walls of the carton body folded flat over the bottom thereof and with the flange folded flat under the cover and the cover folded over the body of the carton and disposed in substantially the plane of the bottom of the carton, which comprises a magazine for receiving a stack of said cartons in collapsed and folded condition and with the bottoms of the cartons presented downwardly, a continuous conveyor provided with means for removing the cartons successively from the magazine and for conveying the cartons in spaced relation and in a single file past a carton opening, filling, and closing station, means at the opening station for opening the cover of the cartons during their uninterrupted travel to expose the body of the cartons and for blocking the body of the cartons during their uninterrupted travel along said conveyor, means at the filling station for depositing a measured quantity of product into the cartons as they proceed in uninterrupted flow, flange opening means at the closing station adjacent said conveyor at opposite sides thereof, means for operating said flange opening means in timed relation with the advancement of a carton by said conveyor for engaging the flange opening means with the flange of the cover and for erecting the same during the travel of the carton, and means cooperating with the flange opening means and conveyor for folding the cover upon the body of the carton while the flange of the carton is in opened position, and synchronous driving means for the conveyor, the opening means, the filling means, and the carton closing means.

23. A machine for handling cartons having a blocked body and a cover provided with a collapsed continuous flange and disposed in open position, comprising a conveyor for advancing the cartons in a continuous and uninterrupted flow along a predetermined path, flange opening means adjacent said conveyor at opposite sides thereof, means for operating said flange opening means in timed relation with the advancement of a carton by said conveyor for engaging the flange opening means with the flange of the cover and for erecting the same during the travel of the carton, and means cooperating with the flange opening means and conveyor for folding the cover upon the body of the carton while the flange of the carton is in opened position.

24. A method of forming, filling, and closing a carton while the carton is in a continuous uninterrupted flow, said carton having a rectangular body formed by a bottom wall, side walls hinged thereto and to each other and a cover hinged to one edge of a wall of the carton body, the opposite edges of said cover carrying a continuous hinged flange therealong, said carton being collapsed with the side walls of the carton body folded flat over the bottom wall thereof and with the flange folded flat under the cover and the cover folded over the body of the carton and disposed in substantially the plane of the bottom wall, which method comprises placing said carton upon a conveyor and moving the carton through a forming station, at which time the carton body will be blocked and the cover will

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be disposed in an open position, and then carrying the carton in continuous movement through a filling station whereby a measured quantity of a product will be deposited within the carton, then carrying the carton through a closing station at which the flange on the cover will be spread outwardly and the cover will then be folded downwardly to close the body of the carton and to dispose said flange in overlapping relation around the side walls of the carton body.

25. The method of forming, filling, and closing a carton while the carton is in continuous uninterrupted flow, said carton having a rectangular body formed by a bottom and side and end walls hinged thereto and to each other, and a cover hinged to one edge of a wall of the carton body and having a continuous flange hinged on the free edges of the cover, said carton being collapsed with the side and end walls of the carton body folded flat over the bottom thereof and with the flange folded flat under the cover and the cover folded over the body of the carton and disposed in substantially the plane of the bottom wall, which method comprises advancing the collapsed carton past a forming station at which the cover is swung to open position and the carton body is blocked, advancing the carton past a filling station where a measured quantity of product is deposited within the carton, and then carrying the carton through a closing station at which the flange of the cover is opened and the cover is folded downwardly upon the body of the carton to close the carton and to dispose the flange of the cover in overlapping relation around the walls of the carton body.

26. The method of forming, filling, and closing a carton while the carton is in continuous uninterrupted flow, said carton having a rectangular body formed by a bottom wall and side and end walls hinged thereto and to each other, and a cover hinged to one edge of a wall of the carton body and having a continuous flange hinged on the free edges of the cover, said carton being collapsed with the side and end walls of the carton body folded flat over the bottom wall thereof and with the flange folded flat under the cover and the cover folded over the body of the carton and disposed in substantially the plane of the bottom wall, which method comprises advancing the collapsed carton in a continuous and uninterrupted flow along a predetermined path, swinging the cover of the carton to open position, opening and blocking the body of the carton, depositing a measured quantity of product within the opened body of the carton, opening the flange of the cover, and folding the cover downwardly upon the body of the carton to close the carton with the flange of the cover disposed in overlapping relation around the walls of the carton body.

27. The method of forming, filling, and closing a carton while the carton is in continuous uninterrupted flow, said carton having a rectangular body formed by a bottom and side and end walls hinged thereto and to each other, and a cover hinged to one edge of a wall of the carton body and having a continuous flange hinged on the free edges of the cover, said carton being collapsed with the side and end walls of the carton body folded flat over the bottom thereof and with the flange folded flat under the cover and the cover folded over the body of the carton and disposed in substantially the plane of the bottom, which comprises advancing the collapsed carton bottom down with the hinge of the cover parallel to the direction of travel past a forming station at which the cover is swung to open posi-

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tion and the carton body is blocked, then advancing the carton past a filling station where a measured quantity of product is deposited into the carton, and then advancing the carton with the hinge of the cover normal to the direction of travel past a closing station at which the flange of the cover is opened and the cover is folded downwardly upon the body of the carton to close the carton and to dispose the flange of the cover in overlapping relation around the walls of the carton body.

28. The method of forming, filling, and closing a carton while the carton is in continuous uninterrupted flow, said carton having a rectangular body formed by a bottom and side and end walls hinged thereto and to each other, and a cover hinged to one edge of a side wall of the carton body and having a continuous flange hinged on the free edges of the cover, said carton being collapsed with the side and end walls of the carton body folded flat over the bottom thereof and with the flange folded flat under the cover and the cover folded over the body of the carton and disposed in substantially the plane of the bottom, which comprises advancing the collapsed carton bottom down in a continuous uninterrupted flow along a predetermined path with the hinge of the cover parallel to the direction of travel of the carton, swinging the cover of the advancing carton to open position, then opening and blocking the body of the carton, depositing a measured quantity of product into the open body of the carton, then advancing the carton with the hinge of the cover normal to the direction of travel of the carton, erecting and spreading apart the flange of the cover, and folding the cover downwardly upon the body of the carton to close the carton while the flange is held spread apart during the initial folding operation of the cover to dispose the flange of the cover in overlapping relation around the side walls and one end wall of the carton body.

29. The method of opening a carton for subsequent filling thereof said carton having a rectangular body formed by a bottom and side and end walls hinged thereto and to each other, and a cover hinged to one edge of a wall of the carton body and having a continuous flange hinged on the free edges of the cover, said carton being collapsed with the side and end walls of the carton body folded flat over the bottom thereof and with the flange folded flat under the cover and the cover folded over the body of the carton and disposed in substantially the plane of the bottom thereof, which method comprises advancing the collapsed carton bottom down in a continuous uninterrupted flow along a predetermined path with the hinge of the cover parallel to the direction of travel of the carton, elevating and swinging the cover outwardly during the continuing flow of the carton to expose the collapsed walls of the body of the carton, and opening the walls of the carton to thereby erect and block the carton body for subsequent filling thereof.

30. A machine for forming, filling, and closing a carton of the type which includes a collapsible rectangular body having a cover hinged along the marginal edge of one wall of said body, which machine comprises a continuous conveyor, means for operating said conveyor, a magazine disposed contiguous to said conveyor for receiving a stack of cartons in their collapsed condition and with the bottoms of the bodies presented downwardly, said conveyor including means for consecutively withdrawing the lowermost carton from said

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magazine and for advancing the cartons in a continuous flow along said conveyor, means disposed along the path of said conveyor for blocking the body portion of the carton to container form, a filling station adjacent said conveyor at which the cartons are successively filled as they move without interruption, and a closing station along the path of said conveyor for folding the hinged cover down over the filled carton to close the same.

31. A machine for forming, filling, and closing a carton moving in continuous and uninterrupted flow through the machine, said carton comprising a collapsible body structure, the side and end walls of which are adapted to be folded in over the bottom of the carton, and one of said walls carrying a cover member hinged to one edge thereof and normally folded upon the collapsed body of the carton in substantially the plane of the carton bottom, a magazine adapted to receive a stack of said cartons in said collapsed and folded condition and with their bottom walls presented downwardly, a continuous conveyor provided with means to receive successive cartons from the magazine and to convey the cartons therewith and consecutively removing the lowermost of said collapsed and folded cartons from the magazine and depositing the same in position upon the conveyor, means arranged along the path of travel of the conveyor for disposing the cover thereof in an open position and for blocking the body of the carton, a filling station at a point along the path of travel of the continuous conveyor and acting to deposit a measured quantity of a product within a carton as the carton passes the station, means along the path of travel of the conveyor to which the filled carton is carried and by which the carton cover is folded over the carton body to close the same, and synchronous driving means for the conveyor, the carton filling means and the closing means.

32. A machine for filling and closing a carton, which carton comprises a bottom wall, side and end walls adapted to fold in over the bottom wall within the confines of the perimeter of the bottom wall, one of said walls having a cover hinged thereto along one edge thereof and a continuous foldable flange hinged to the cover along the remaining edges thereof, a conveyor structure to receive and carry a carton through the machine in continuous and uninterrupted flow, a carton magazine disposed at a station contiguous to said conveyor structure, feed means for consecutively withdrawing the lowermost carton from said magazine and depositing it upon said conveyor structure, means along the path of travel of the conveyor structure for engaging the carton to block the body of the same and to dispose the cover in an open position, a carton filling device disposed along the path of travel of the conveyor structure and adapted to deposit a desired quantity of a product in the cartons successively as they proceed through the machine in uninterrupted flow, means for engaging the hinged flange of the carton cover to spread the same so that it may overlap contiguous walls of the carton body when the cover is closed, means engaging the cover to move the same to a closed position and the cover flange to an overlapping position as the carton is carried through the machine, and synchronous driving means for the conveyor structure, the magazine feed, the filling device and the closing mechanism.

33. A machine for handling cartons having their body portions collapsed and their lids over-

lying the same comprising a conveyor for advancing the cartons in a continuous uninterrupted flow along a predetermined path, means associated with the conveyor for turning back the lids of the cartons to expose the body portions of the cartons, and carton opening fingers adjacent said conveyor for entering the exposed body portions of the cartons and for spreading the walls thereof to thereby open up the body portions of the cartons.

34. A machine for handling cartons having their body portions collapsed and their lids overlying the same comprising a conveyor for advancing the cartons in a continuous uninterrupted flow along a predetermined path, means associated with the conveyor for elevating and turning back the lids of the cartons to expose the body portions of the cartons, carton opening fingers adjacent said conveyor for entering the exposed body portions of the cartons and for spreading the walls thereof to open up the body portions of the cartons, and means for controlling the operation of said fingers in accordance with the advancement of the cartons along said path.

35. A machine for handling cartons having a rectangular body formed by a bottom and end and side walls hinged thereto and to each other and a cover hinged on one of said walls, said cartons being collapsed with the side and end walls folded flat upon the bottom and the cover folded upon the collapsed body of the carton comprising a conveyor for advancing the cartons

bottoms down in a continuous and uninterrupted flow along a predetermined path, means associated with the conveyor for turning back the lids to expose the body portions of the cartons, and means for engaging and erecting the end walls of the body portions whereby the side walls hinged thereto are simultaneously erected therewith and the body portions are blocked during the continuous flow of said cartons.

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