April 28, 1959 W. PECHY 2,883,812

MACHINE FOR PACKING ARTICLES INTO CARRIERS

Filed July 27, 1954 3 Sheets-Sheet 1

Fig. 1

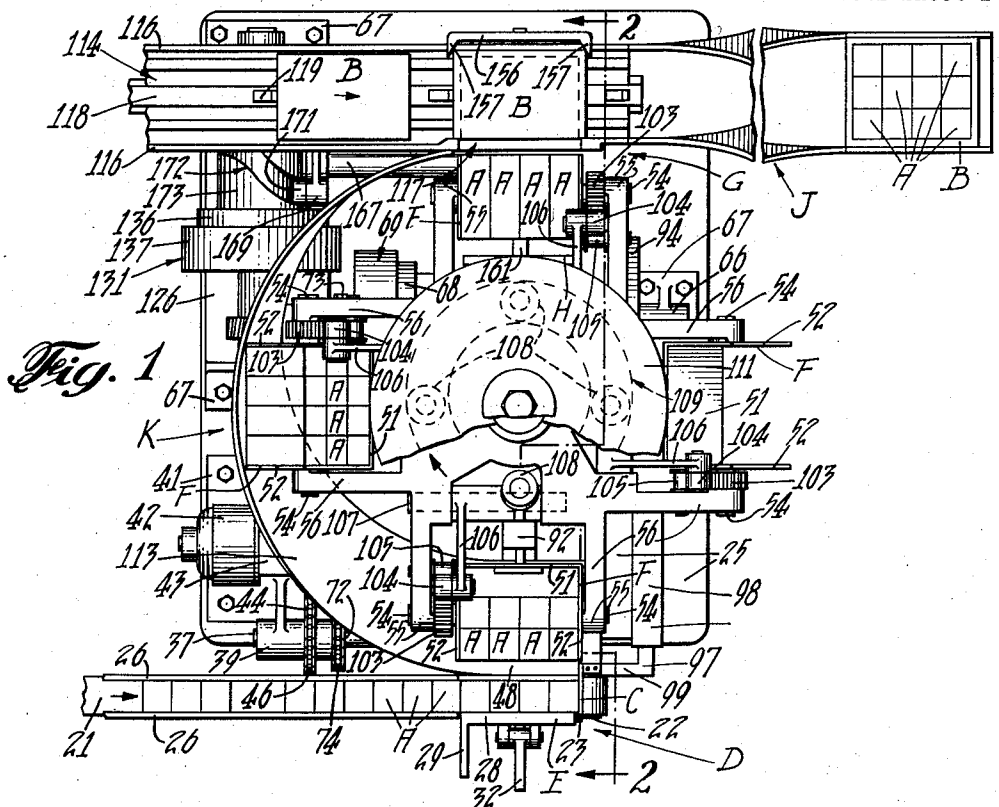
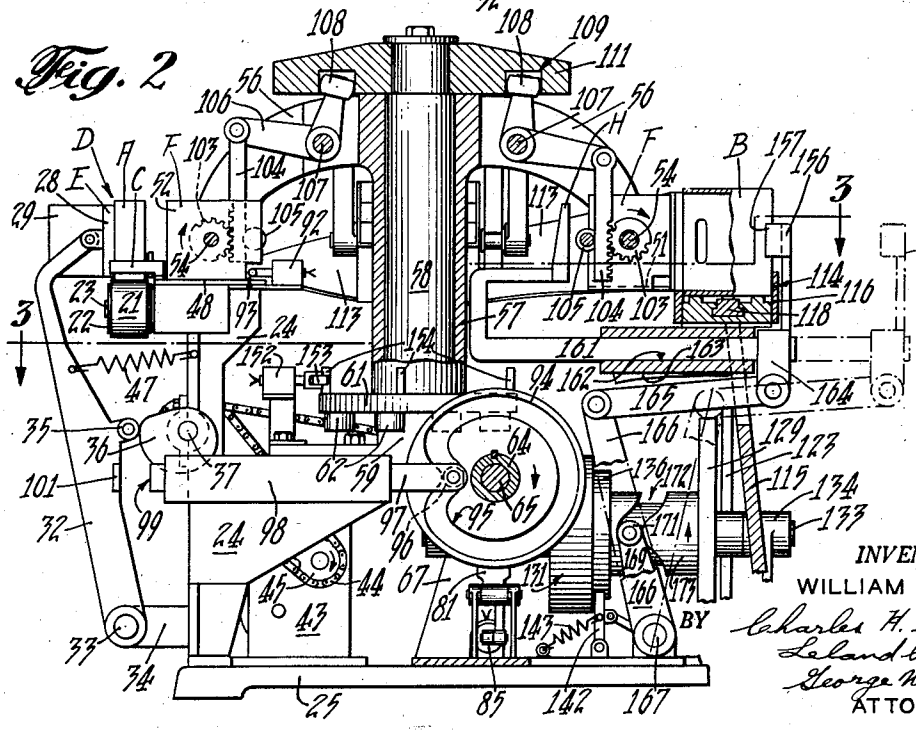


Fig. 2



INVENTOR.
WILLIAM PECHY
BY Charles H. Luna
Leland P. McCann
George W. Reiber
ATTORNEYS

April 28, 1959 W. PECHY 2,883,812

MACHINE FOR PACKING ARTICLES INTO CARRIERS

Filed July 27, 1954 3 Sheets-Sheet 2

Fig. 3

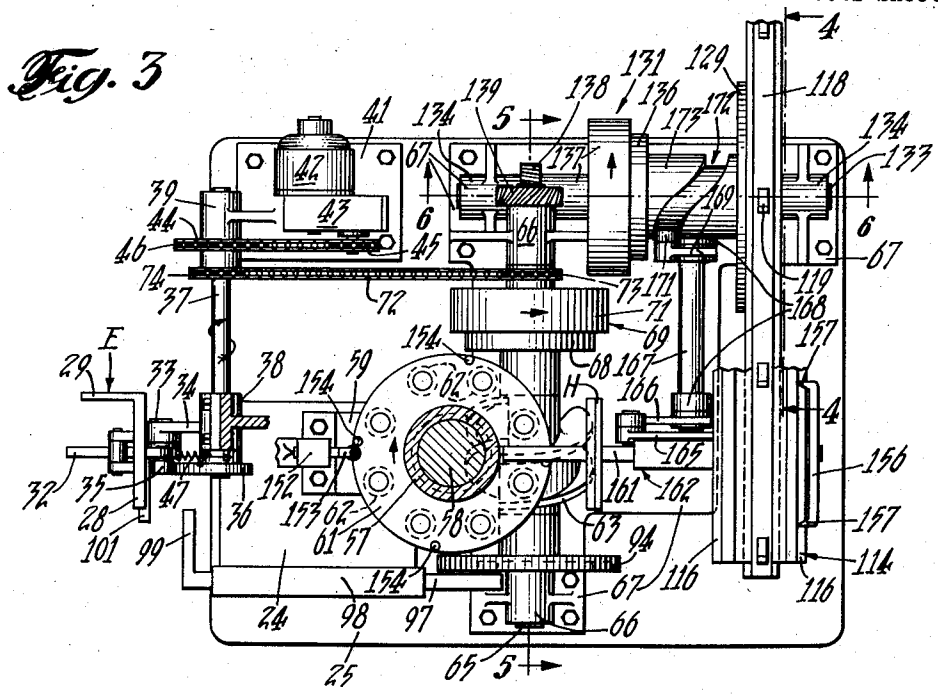
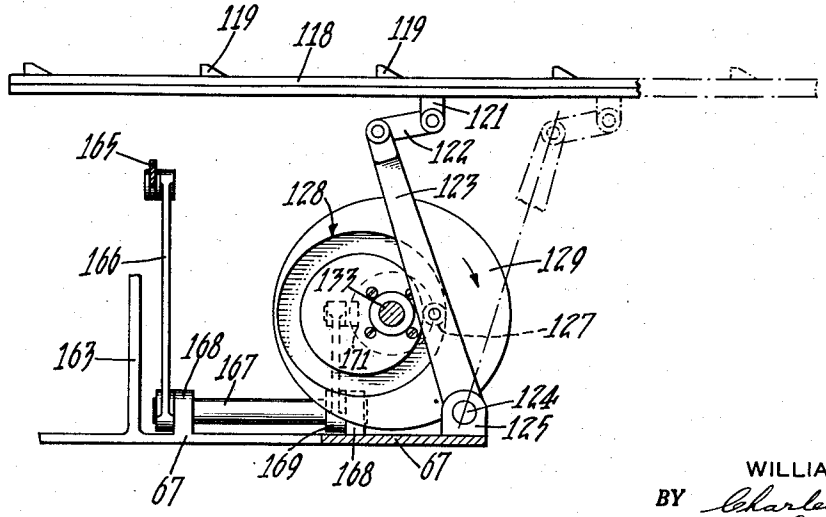


Fig. 4



INVENTOR.
WILLIAM PECHY
BY Charles H. Ernst
Leland R. McCann
George W. Reiber
ATTORNEYS

April 28, 1959 W. PECHY 2,883,812

MACHINE FOR PACKING ARTICLES INTO CARRIERS

Filed July 27, 1954 3 Sheets-Sheet 3

Fig. 5

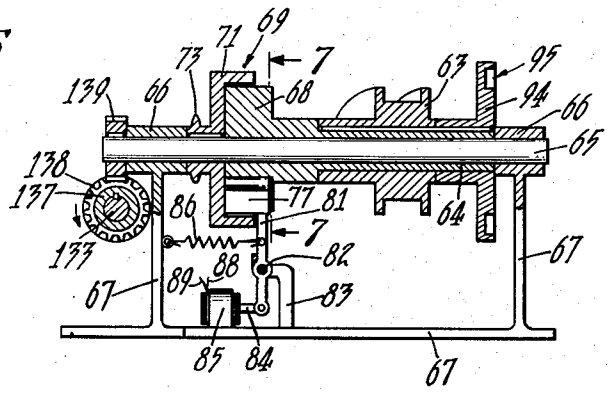


Fig. 6

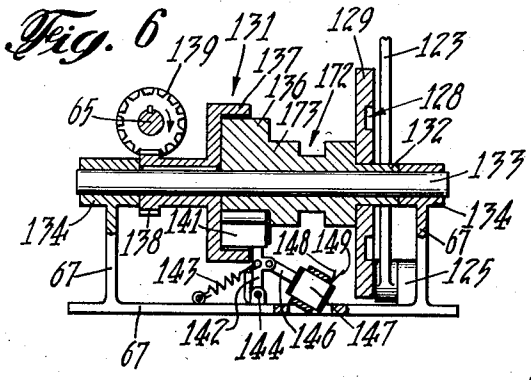


Fig. 7

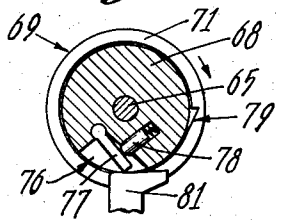


Fig. 8

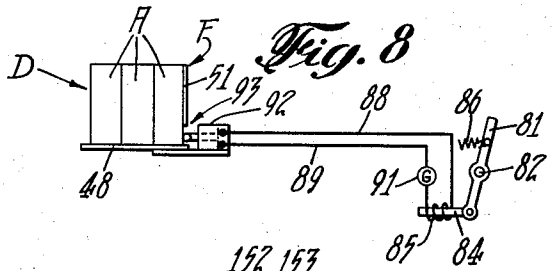


Fig. 10

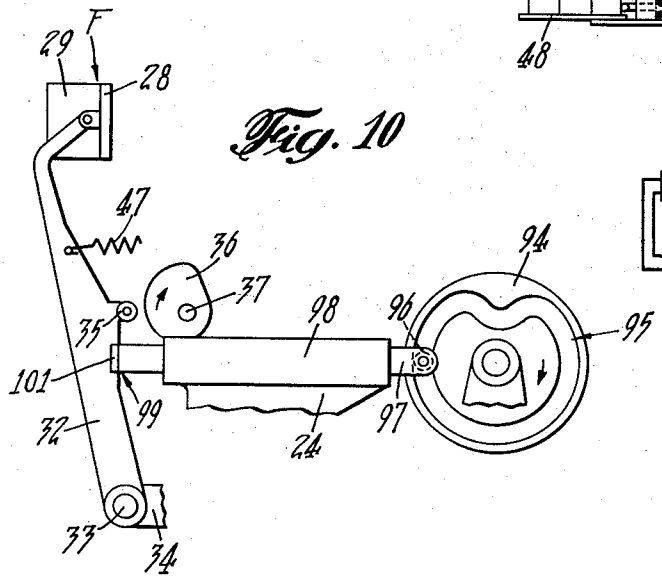
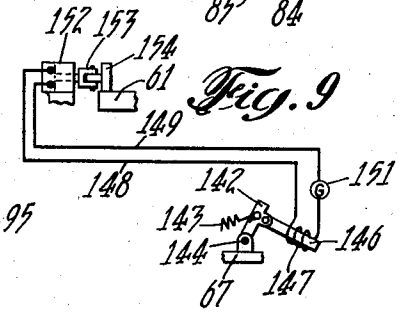


Fig. 9



INVENTOR.
WILLIAM PECHY
BY Charles H. Erne
Leland R. McCann
George W. Reiber
ATTORNEYS

United States Patent Office 2,883,812 Patented Apr. 28, 1959

2,883,812

MACHINE FOR PACKING ARTICLES INTO CARRIERS

William Pechy, Belmar, N.J., assignor to American Can Company, New York, N.Y., a corporation of New Jersey

Application July 27, 1954, Serial No. 446,022

19 Claims. (Cl. 53—164)

The present invention relates to a machine for loading or packing articles into cartons or other carriers and has particular reference to devices for receiving and accumulating or assembling a predetermined number of articles in a predetermined arrangement to fit a carton and for packing the assembled articles into the carton.

An object of the instant invention is the provision of a fully automatic machine for packing articles into cartons wherein the articles are handled gently and expeditiously to assemble them in a predetermined arrangement and turn the assemblage into a predetermined position for gentle insertion into a carton.

Another object is the provision of such a machine wherein the cartons to be loaded are handled in such a manner as to receive the articles while the carton is resting on its side and to right the filled carton for further disposal.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a top plan view of a machine embodying the instant invention, with parts broken away;

Fig. 2 is a sectional view taken substantially along the line 2—2 in Fig. 1, with parts broken away and parts shown in dot and dash line positions;

Fig. 3 is a horizontal section taken substantially along the line 3—3 in Fig. 2;

Fig. 4 is a fragmentary sectional view taken substantially along the line 4—4 in Fig. 3, with parts shown in dot and dash line positions;

Figs. 5 and 6 are sectional views taken substantially along the lines 5—5, 6—6 in Fig. 3;

Fig. 7 is a sectional view taken substantially along the line 7—7 in Fig. 5;

Figs. 8 and 9 are schematic views including wiring diagrams and showing how electric solenoids shown in Figs. 5 and 6 respectively are connected to controlling switches located in other sections of the machine; and

Fig. 10 is a fragmentary elevational view of certain of the machine parts shown at the left in Fig. 2 in a different position.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate a machine for packing articles A (Fig. 1), for example rectangular fibre milk containers, either empty or filled, into carriers, such as cases or cartons B, for shipment or storage.

The containers A are received from any suitable source of supply, such as storage, a container making machine or a filling machine, and enter the machine (Fig. 1) in a substantially continuous moving procession, with the containers disposed in an upright position and in contiguous relation to each other. The procession terminates at a stop C (Figs. 1 and 2) at an accumulating or assembling station D and aligns a row of a predetermined number of contiguous containers opposite a reciprocable

pusher E which pushes the row of containers laterally out of the procession and introduces them into a movable mold F. This operation is repeated until the mold F is filled with containers. By way of example, the drawings show each row as comprising four containers, and the mold having a capacity of three rows, making a total of twelve containers in the mold when filled, the assembled containers being in a predetermined arrangement which just fits into a carton or case B.

When the mold F is filled with twelve containers A it is shifted preferably along a curved path of travel into a loading or packing station G where a carton B is waiting in proper position to receive the assembled batch of containers. To facilitate loading of the containers into the carton, the carton is positioned on its side with one end open and this end facing the station G so that the containers now in horizontal position can be pushed horizontally into the carton. For this purpose, the mold F as it travels toward the loading station G, is turned from a vertical position to a horizontal position so that the containers are also in a horizontal position resting on their sides.

At the loading station G, the mold F comes to rest in front of an auxiliary pusher H which is horizontally aligned with the waiting carton B. The pusher H immediately pushes the assembled batch of containers A endwise out of the mold F and into the empty open carton. Thereafter the filled carton B is propelled through a twister J which turns the carton into an upright position so that the containers in the carton are disposed upright and in proper relation for delivery to a suitable place of deposit for storage or shipment in the cartons. This completes the cycle of operation of packing the individual containers into the cartons.

In the machine, the procession of incoming upright containers A is supported on and is advanced by the upper run of a horizontally disposed endless belt conveyor 21 (Figs. 1 and 2) which is actuated continuously in any suitable manner and which at the assembly station D operates over a pulley 22 mounted on a shaft 23 journaled in a subframe 24 carried on a main base plate 25. The upper run of the conveyor 21 operates through a supporting runway having side guides 26 for maintaining the procession of containers in straight line alignment.

The stop C which arrests advancement of the containers at the station D preferably is a stationary finger-like member which is secured to the subframe 24 and which extends outwardly across the upper run of the conveyor 21 in the path of travel of the containers.

The assembly pusher E disposed at the assembly station D is an L-shaped member (see Fig. 1) having a vertically disposed pusher plate 28 extending parallel with and adjacent the upper run of the conveyor 21 for reciprocating movement across the conveyor. One edge of the pusher plate 28 (at the right in Fig. 1) is disposed adjacent the stop finger C. The opposite edge of the plate is formed with a holding or stop plate 29 which moves with the pusher plate 28 across the upper run of the conveyor and temporarily holds back the procession of incoming containers. In the instant machine the pusher plate 28 is long enough to span across a row of four containers as shown in Fig. 1.

The pusher E is reciprocated across the conveyor 21 by cam action. For this purpose the pusher plate 28 is pivotally secured to the upper end of an upright cam lever 32 which at its lower end is mounted on a pivot pin 33 (see also Fig. 3) carried in a lug 34 which extends out from the subframe 24. Intermediate its length the cam lever 32 carries a cam roller 35 which operates against an edge cam 36 mounted on a shaft 37 journaled in a pair of spaced bearings 38, 39 (Fig. 3). The bearing 38 is formed in the subframe 24. The bearing 39

is formed in a subframe 41 which is mounted on the base 25 and which supports a continuously actuated electric motor 42 which constitutes the main driving element at the machine. The motor 42 is connected to a conventional speed reduction unit 43 which drives an endless chain 44 operating over a sprocket 45 of the reduction unit and a sprocket 46 on the cam shaft 37 to rotate the shaft 37 and the cam 36 attached thereto in the proper direction and at the proper speed. A tension spring 47 connecting the cam lever 32 with the subframe 24 keeps the cam roller 35 in operating engagement with the edge cam 36.

Hence as the edge cam 36 rotates through a cycle of operation it permits the spring 47 to yieldably rock the cam lever 32 (toward the right as viewed in Fig. 2) through a pusher stroke and then returns the cam lever to its original position against the resistance of the spring. During the pusher stroke, the cam lever 32 advances the pusher plate 28 into engagement with the four leading containers A of the procession on the conveyor 21, and pushes them laterally as a unit row across and off the conveyor onto an adjacent horizontally disposed table 48 located just beyond the upper run of the conveyor and supported on the subframe 24. The unit row of containers A in being transferred to the table 48 are simultaneously inserted into a mold F disposed in alignment with the pusher E for the reception of the containers as best shown in Fig. 1.

As soon as the row of containers A is introduced into the mold F, the pusher moves back through a return stroke, clear of the conveyor 21 and permits the procession of containers to move up into engagement with the stop finger C to locate the next row of four containers for transfer into the mold adjacent the first inserted row, by a repeat operation of the pusher E.

The mold F is a U-shaped member having a back wall section 51 and two spaced end wall sections 52, the top, bottom and front of the mold (as viewed in Fig. 1) being open, the open front facing the conveyor 21 when in its normally vertical position. There preferably are four of these molds F mounted for movement on their own axes and also for movement bodily along a circular path of travel extending from the assembly station D to the packing station G which is located on the opposite side of the machine. To facilitate this movement of the molds F in two directions the end wall sections of the molds are formed with trunnions 54 which are carried in bearings 55 formed in four pairs of spider or turret arms 56 which extend out radially at quadrants of a central rotatable upright column 57 (Figs. 2 and 3) mounted on a stationary shaft or post 58 carried on a bracket 59 secured to the subframe 24.

The column 57 is rotated through step-by-step or partial rotations in time with the insertion of the rows of containers A into the molds F to shift the filled molds F at the proper time. This rotation of the column 57 is effected through a conventional indexing device having an indexing wheel 61 (Figs. 2 and 3) secured to and surrounding the bottom of the column. The indexing wheel 61 carries eight equally spaced depending cam rollers 62 which are engageable by a double barrel cam 63 (see also Fig. 5) carried on and keyed to a normally stationary long sleeve 64 freely mounted on a continuously rotating shaft 65 disposed in an offset relation to the center of the column 57 and journaled in a pair of spaced bearings 66 formed in a subframe 67 fastened to the machine base 25.

The long sleeve 64 is formed integrally with a free member 68 of a conventional one revolution clutch 69 having a driven member or ring 71 which surrounds the free member 68 and is keyed to the continuously rotating shaft 65. The clutch ring 71 and the shaft 65 are rotated by an endless chain 72 (Fig. 3) which operates over a sprocket 73 formed on the clutch ring 71 and over a driving sprocket 74 on the cam shaft 37. The free member 68 on the clutch 69 is formed with a peripheral recess 76 (see Fig. 7) which houses a driving dog 77 pivotally mounted in the free member 68 and maintained under an outwardly directed pressure exerted by a spring barrel 78 carried in the free member.

The driving dog 77 is held out of engagement with a driving notch 79 in the rotating clutch ring 71, by a flapper 81 which is disposed under the dog. The flapper 81 intermediate its length is mounted on a pivot pin 82 (Fig. 5) carried in a lug 83 which extends up from the bracket 67. The opposite end of the flapper 81 is pivotally connected to a movable core 84 of a normally deenergized electric solenoid 85 secured to the subframe 67. A tension spring 86 connected to the upper end of the flapper 81 and the adjacent subframe 67 keeps the flapper in position under the clutch drive dog 77.

The electric solenoid 85 is temporarily energized every time a mold F is filled with containers A. For this purpose the solenoid 85 is connected by wires 88, 89 (Fig. 8) to a source of electric current such as a generator 91 and to a normally open switch 92 disposed adjacent the mold F at the assembly station D. The movable element of the switch 92 projects into an opening 93 (see Figs. 2 and 8) in the back and side wall sections of the mold and is engaged by the containers A when the third or last row of containers is pushed into the mold to fill it. This engagement of the movable element of the switch closes the switch and thus completes the circuit leading to the solenoid 85. This energizes the solenoid and thus rocks the flapper 81 laterally from under the clutch driving dog 77 and releases the dog for engagement in the driving notch 79 of the rotating clutch ring 71. The free member 68 and the cam 63 attached thereto thereupon rotate with the clutch ring 81 through one revolution.

During this revolution of the free clutch member 68, the barrel cam 63 successively engages two of the depending rollers 62 on the indexing wheel 61 and thus rotates the column 57 through a partial rotation of ninety degrees. This movement of the column 57 shifts the filled mold F from the assembly station D (Fig. 1) to an idle station K and swings an empty mold F into position at the assembly station D to receive a load of containers A as explained hereinbefore.

In order to insure that the free clutch member 68 makes only one revolution, the electric switch 92 is opened and the circuit broken before completion of the revolution. This is brought about by the mold F moving away from the switch. When the mold F advances out of range of the switch, the movable element of the switch is released. Hence the switch opens and the solenoid 85 is deenergized. The spring 86 thereupon draws the flapper 81 back into its original position in readiness for engagement with the clutch dog 77. Upon completion of the one revolution of the clutch 79 the dog rides up on the flapper and thereby releases itself from the notch 79 in the clutch ring 71 and the free member 68 and cam 63 attached thereto stop rotating.

While the filled mold F is traveling from the assembly station G to the idle station K, the pusher 28 is held stationary out of engagement with the containers A on the entrance conveyor 21, to prevent feeding of the containers from the conveyor 21 until an empty mold F is moved into filling position at the assembly D. This is brought about by cam action. For this purpose the long sleeve 64 of the free clutch member 68 carries a face cam 94 (Figs. 2, 3, 5 and 10) having a cam groove 95 which is traversed by a cam roller 96 mounted on a horizontal slide bar 97 which operates in a slide bearing 98 on the subframe 24. On the end opposite the cam roller 96, the slide bar 97 is formed with an angularly disposed prong 99 (Figs. 1 and 3) which is located in the path of travel of a lug 101 on the pusher lever 32.

The cam groove 95 is designed to hold the slide bar 97 and its prong 99 in a retracted position while the cam 94

is stationary during normal feeding of the containers A from the conveyor **21** into the mold F. However when the mold is filled and is shifted through rotation of the free clutch member **68** through one revolution, the cam **94** turns with the free member and projects the slide bar **97** outwardly to engage its prong **99** against the lug **101** of the pusher lever **32** and thereby holds the lever away from its actuating cam **36**. The lever **32** thereupon remains idle until the cam **94** completes its one revolution and withdraws the slide bar **97**. At the completion of this one revolution, the filled mold F has been shifted into the idle station K and an empty mold is at the assembly station D ready for filling.

During advancement of the filled mold F from the assembly station D to the idle station K, the mold is turned or partially rotated on its trunnions **54** through an angle of substantially forty-five degrees as an incident in changing the position of the containers from their original vertical position to a horizontal position to facilitate packing into the cartons B. This rotation of each mold F if effected by a gear **103** (Figs. 1 and 2) which is carried on one of each pair of the trunnions **54**. The gears **103** mesh with vertically disposed racks **104** which are maintained in meshing engagement with the gears by rollers **105** carried in the molds (Fig. 2). The upper ends of the racks **104** are pivotally attached to bell cranks **106** mounted on pivot pins **107** carried in the spider arms **56**. The bell cranks **106** carry cam rolls **108** which operate in and traverse a cam groove **109** in a stationary horizontally disposed face cam **111** secured to the top end of the vertical post **58**.

As a filled mold F begins its travel from the assembly station D to the idle station K, the cam roll **108** associated with this mold, in traversing the stationary cam groove **109**, rocks the associated bell crank **106** in a counterclockwise direction as viewed in Fig. 2 and thus rotates the mold F in a clockwise direction to tilt the containers toward a horizontal position as shown in Fig. 1. During this rotation and forward travel of the mold F, the containers are supported by the back wall section **51** of the mold and are maintained in position in the mold by a curved extension **113** of the table **48** against which the bottoms of the containers engage and slide as the mold advances. This curved table extension **113** extends all the way to the packing station G and guides the containers until they are in a horizontal position.

At the idle station K, the angularly disposed filled mold F remains stationary until the next succeeding mold positioned at the assembly station D receives its batch of containers A. When the column **57** is again rotated to transfer the newly filled mold F from the assembly station D to the idle station K, the filled mold at the idle station K moves from this station to the packing station G. During this travel from station K to station G, the mold is further rotated on its trunnions 54 as explained above to further tilt the containers from the forty-five degree inclination at station K to a fully horizontal position at station G. In this fully horizontal position the containers lie on their sides in the mold with the back wall section **51** of the mold under and supporting the containers as shown at the right in Fig. 2.

At the packing station G the batch of horizontally disposed containers A in the mold F are in endwise alignment with the auxiliary pusher H adjacent their inner ends and at their outer ends are adjacent the open top end of a prepositioned carton B lying on its side and awaiting reception of the containers. The carton B is supported in a horizontal runway **114** (Figs. 1, 2 and 3) disposed adjacent the packing station G in parallelism with the entrance conveyor **21** and supported by a bracket **115** secured to the main base plate **25**. The runway **114** is provided with side guides **116** to guide the cartons B through the packing station G. At the station G the inner guide **116** is provided with an opening **117** (Fig. 1) to permit the containers A to be transferred as a batch from the mold to the carton.

The cartons B are advanced endwise along the runway **114**, lying on their side with the open side toward the machine, and in processional order by a reciprocable stroke bar or feeding mechanism **118** (Figs. 1, 2, 3 and 4) having spaced spring pressed retractible feed dogs **119** for propelling engagement behind the cartons B. The stroke bar **118** slides in a groove formed in the bottom of the runway (see Fig. 2). Reciprocation of the stroke bar **118** is effected in time with the advancement of the molds F. For this purpose the stroke bar **118** is formed with a depending lug **121** (Fig. 4) which is pivotally connected by a link **122** to the upper end of an upright actuating arm **123**. At its lower end the arm **123** is mounted on a pivot shaft **124** carried in a bearing **125** formed on the subframe **67**. Intermediate its ends, the actuating arm **123** carries a cam roller **127** which operates in a cam groove **128** of a normally stationary face cam **129**.

The face cam **129** is periodically rotated through a single revolution by a one revolution clutch **131** (Fig. 6) controlled by the advancement of the molds F. For this purpose the cam **129** is mounted on and rotates with a normally stationary sleeve **132** which is free on a shaft **133** journaled at its ends in bearings **134** which extend up from the subframe **67**. The sleeve **132** is part of a cylindrical free clutch member **136** which is surrounded by a continuously rotating clutch ring **137** keyed to the shaft **133**. The shaft **133** and the clutch ring **137** are rotated by a helical gear **138** formed integrally with the clutch ring and meshing with a helical driving gear **139** mounted on the continuously rotating shaft **65** (see Fig. 3).

Like the one-revolution clutch **69** (Fig. 7) hereinbefore described, the clutch **131** is provided with a driving notch in the ring **137** and a pivotally mounted spring backed driving dog **141** (Fig. 6) in the free clutch member **136**. The dog **141** is normally held in nonoperating position by a flapper **142** (Fig. 6) which is held in position by a spring **143** and which is mounted on a pivot pin **144** in a lug on the subframe **67**. Intermediate its ends, the flapper **142** is connected to a movable core **146** of a normally deenergized electric solenoid **147** mounted on the subframe **67**. The solenoid **147** is connected by wires **148, 149** (Fig. 9) to a source of electric current such as a generator **151** and to a normally open electric switch **152** disposed adjacent the outer periphery of the indexing wheel **61** (see Figs. 2 and 3) and secured to the adjacent bracket **59** on the subframe **24**. The switch **152** is provided with a movable element **153** interposed in the path of travel of a plurality of actuating pins **154** which project up from the top face of the indexing wheel **61**.

There are four actuating pins **154** secured in the indexing wheel **61** and they are spaced ninety degrees apart and disposed in positions adjacent the four molds in a relation that effects passing engagement of a pin **154** with the movable element **153** of the switch **152** at the beginning of a partial rotation of the indexing wheel **61** to advance the molds F. This movement of the switch element **153** momentarily closes the switch **152** and thus momentarily closes the circuit and energizes the solenoid **147** (Fig. 9). This rocks the flapper **142** of the one revolution clutch **131** (Fig. 6) laterally and releases the driving dog **141** of the free clutch member **136** to engage in the notch of the continuously rotating clutch ring **137** so as to rotate the free member **136**, sleeve **132**, and face cam **129** through a single revolution. The momentary energization of the solenoid **147** immediately permits the flapper **142** to return to its original position under the pull of the spring **143** as soon as the free member begins to rotate, so that the driving dog **141** is withdrawn from clutch driving position at the end of one revolution to bring the cam **129** to rest after one cycle of operation.

During this one revolution cycle of operation of the clutch 131, the cam 129 rocks the stroke bar actuating lever 123 and the stroke bar 118 connected thereto, through a forward or feeding stroke (toward the right as viewed in Fig. 1) to the full line position shown in Fig. 4 and then through a return stroke (toward the left in Fig. 1) to the position shown in dot and dash lines in Fig. 4. During the feeding stroke, the stroke bar 118 advances an empty carton B into the packing station G and advances a filled carton B out of the packing station and into the twister section J of the runway 114.

After an empty carton B is advanced into the packing station G and while the stroke bar 118 is moving back through its return stroke, the carton is accurately located relative to the filled mold F at the packing station G and the containers are pushed from the mold into the carton. Location of the carton B is effected by a movable locating bracket or element 156 disposed adjacent and clear of the path of travel of the cartons on the runway 114. The locating bracket 156 is disposed in line with a mold F at rest at the station G and is formed with a pair of tapered or angularly disposed locating fingers 157 spaced apart a sufficient distance to engage against the outer corners of the carton and shift it slightly along the runway in either direction as the bracket 156 is moved inwardly toward the runway.

The locating bracket 156 is carried on the outer end of a horizontally disposed reciprocable slide bar 161 (Fig. 2) which is disposed under the runway 114 and which operates in a slideway 162 formed in an upright leg portion 163 of the subframe 67. The inner end of the slide bar 161 carries the auxiliary pusher H. The slide bar 161 is reciprocated in time with the other moving parts of the machine by a depending lug 164 (Fig. 2) carried on the outer end of the slide bar and connected by a link 165 to the upper end of an upright actuating lever 166. The lower end of the lever 166 is mounted on a shaft 167 (see also Figs. 3 and 4) journaled in spaced bearings 168, formed in the subframe 67 (Fig. 4). The shaft is rocked by an arm 169 carried on the shaft. The free end of the arm carries a cam roller 171 which operates in a cam groove 172 of a barrel cam 173 formed as an integral part of the free clutch member 136 and the sleeve 132 (see Fig. 6).

Hence while the one revolution clutch 131 is driving the free clutch member 136 through a one revolution cycle and while the stroke bar 118 is moving back during this cycle, the barrel cam 173 rocks the arm 169, shaft 167 and actuating lever 166 to move the locating bracket 156 inwardly (toward the left in Fig. 2) toward the carton B at the station G to engage and shift the carton laterally into alignment with the mold F, and then rocks the lever 166 in the opposite direction (toward the right in Fig. 2) to move the pusher H through the mold F at the station G. This movement of the pusher H pushes the batch of containers A in the mold, endwise out of the mold and into the aligned carton B, through the opening 117 in the runway and the open end of the carton. The cam 173 continues its operation to rock the lever 166 back again (toward the left in Fig. 2) to return the pusher H and the locating bracket 156 to their original positions after the containers have been pushed into the carton B. This completes the cycle of operation of the machine.

As empty cartons B are filled and advanced by the stroke bar 118 into the twister section J of the runway, the filled cartons engage each other and push each other forward along the runway through the twister section. The twister section comprises curved or twisted portions of the side guides 116 and operate to turn the cartons from an on-side position to an upright position with the open side on top as shown at the right in Fig. 1. In this position the cartons are pushed by each other to any suitable place of deposit.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A machine for packing articles into carriers, comprising in combination a rigid U-shaped mold for receiving articles in a predetermined arrangement, said mold having an open side and being rotatable on an axis of its own and also being movable bodily in a lateral direction, means for feeding said articles into said mold, means for shifting said filled mold bodily into a position adjacent an open side of a carrier, means for axially rotating said mold to align its open side with the open side of said carrier, and reciprocable pusher means engageable with said articles for transferring the articles from said mold to said carrier.

2. A machine for packing articles into carriers, comprising in combination a vertically disposed axially rotatable mold of substantial U-shape and having rigid rear and end walls for receiving articles in an upright position and in a predetermined arrangement, means for feeding said articles into said mold, means for shifting said mold into position adjacent an open side of a carrier lying on its side, means for turning said mold from its vertical position into a horizontal position to position said articles horizontally and in alignment with the open side of said carrier, and reciprocable pusher means engageable with said horizontally disposed articles for transferring the same from said mold to said carrier.

3. A machine for packing articles into carriers, comprising in combination a conveyor for advancing articles in a substantially continuous procession into an assembly station, a revoluble and axially rotatable mold disposed at said assembly station adjacent said conveyor, pusher means disposed adjacent said conveyor opposite said mold, means for actuating said pusher means toward said mold into engagement against the sides of said articles for pushing articles from said conveyor into said mold to fill said mold, means for revolving said filled mold from said assembly station into registry with a said carrier, means for axially rotating said mold during revolving thereof to align the articles therein with an open side of said carrier, and pusher means operating through said mold and engageable against the ends of said articles for transferring said articles from said mold to said carrier.

4. A machine for packing articles into carriers, comprising in combination a vertically disposed revoluble and axially rotatable mold of substantial U-shape and having rigid connected rear and end walls for receiving articles in a predetermined arrangement, means for feeding said articles into said mold, means for bodily revolving said mold into a packing station, means at said packing station for supporting a carrier having an open side, means for axially rotating said mold to a substantially horizontal position to align said articles with the open side of said carrier, and reciprocable pusher means engageable with said articles for transferring the same from said mold to said carrier.

5. A machine for packing articles into carriers, comprising in combination an assembly conveyor for advancing articles in a substantially continuous procession into an assembly station, a packing conveyor for advancing carriers having one side open in a substantially continuous procession into a packing station remotely disposed relative to said assembly station, means for actuating said conveyors, a revoluble and axially rotatable mold of substantial U-shape having an open filling side and an open discharge side movable between said stations, means for bodily revolving said mold from one station to the other, means at said assembly station for feeding articles from said assembly conveyor into said mold, reciprocable pusher means engageable with said articles at said pack-

ing station for transferring the articles from said mold to said carrier, and gear means for axially rotating said mold first to position its open filling side adjacent said assembly conveyor at said assembly station to receive said articles and thereafter to position its open discharge side at said packing station adjacent the open side of said carrier for the transfer of the articles to the carrier.

6. A machine of the character defined in claim 5 wherein a locating element is disposed at said packing station adjacent said packing conveyor for accurately locating said carrier with its open side in alignment with the open discharge side of said mold to facilitate transfer of the articles from the mold to the carrier.

7. A machine for packing articles into carriers, comprising in combination an assembly conveyor for advancing articles in a substantially continuous procession into an assembly station, a packing conveyor for advancing carriers lying on their sides and with an adjacent side open in a substantially continuous procession through a packing station remotely disposed relative to said assembly station, means for actuating said packing conveyor intermittently to position a carrier at rest at said packing station, a rotatable spider mounted between said stations, a plurality of molds mounted on said spider for bodily travel therewith, each of said molds being also rotatable relative to said spider on an axis of its own and having an open filling side and an open discharge side, means for rotating said spider intermittently in time with the advancement of said carriers and for rotating said molds on their axes to position said molds successively first at said assembly station with their open filling sides adjacent said assembly conveyor and second at said packing station to position their open discharge sides adjacent the open sides of carriers located at said packing station, feeding means at said assembly station for feeding articles from said assembly conveyor into a mold positioned at said assembly station, and auxiliary feeding means at said packing station for transferring said articles from a mold positioned at said packing station into a carrier disposed at said packing station.

8. A machine of the character defined in claim 7 in which said feeding means is a reciprocable pusher element disposed adjacent said assembly conveyor at said assembly station for movement across said conveyor for engaging and pushing a row of articles from said conveyor into a said mold at rest at said assembly station, and pusher actuating means for repeatedly reciprocating said pusher element to feed a predetermined number of rows of articles into said mold to fill said mold.

9. A machine of the character defined in claim 8 in which said pusher actuating means includes means for arresting movement of said pusher element after a predetermined number of repeated reciprocations of said element to facilitate advancement of a filled mold.

10. A machine of the character defined in claim 7 in which a table having a curved extension extending from said assembling station to said packing station is provided for retaining the articles in said molds.

11. A machine of the character defined in claim 7 in which said auxiliary feeding means is a reciprocable pusher element disposed at said packing station for movement through said mold and toward said packing conveyor for transferring the articles from said mold to said carrier, and means for reciprocating said pusher element in time with the advancement of said molds into said packing station.

12. A machine of the character defined in claim 11 in which a carrier locating element disposed adjacent said packing conveyor at said packing station is connected to and reciprocable with said pusher element for engaging and accurately locating a carrier in alignment with said mold to facilitate transfer of the articles from said mold to said carrier.

13. A machine for packing articles into carriers, comprising in combination an assembly conveyor for advancing articles in a substantially continuous procession into an assembly station, a packing conveyor for advancing carriers lying on their sides and with an adjacent side open in a substantially continuous procession through a packing station remotely disposed relative to said assembly station, means for actuating said packing conveyor intermittently to position a carrier at rest at said packing station, a rotatable spider mounted between said stations, a plurality of molds mounted on said spider for bodily travel therewith, each of said molds having an open filling side and an open discharge side, each of said molds being also rotatable relative to said spider on an axis of its own, means for rotating said spider intermittently in time with the advancement of said carriers and for rotating said molds on their axes to position said molds successively first at said assembly station with their open filling sides adjacent said assembly conveyor and second at said packing station to position their open discharge sides adjacent the open sides of carriers located at said packing station, feeding means at said assembly station for feeding articles from said assembly conveyor into a mold positioned at said assembly station, auxiliary feeding means at said packing station for transferring said articles from a mold positioned at said packing station into a carrier disposed at said packing station, and means adjacent said packing station for receiving and turning a filled carrier form its onside position to an upright position with its open side facing upwardly.

14. A machine for packing articles into carriers, comprising in combination an assembly conveyor for advancing articles in a substantially continuous procession into an assembly station, a packing conveyor for advancing carriers lying on their sides and with an adjacent side open in a substantially continuous procession through a packing station remotely disposed relative to said assembly station, means for actuating said packing conveyor intermittently to position a carrier at rest at said packing station, a rotatable spider mounted between said stations, a plurality of molds mounted on said spider for bodily travel therewith, each of said molds being also rotatable relative to said spider on an axis of its own and having an open filling side and an open discharge side, means for rotating said spider intermittently in time with the advancement of said carriers and for rotating said molds on their axes to position said molds successively first at said assembly station with their open filling sides adjacent said assembly conveyor and second at said packing station to position their open discharge sides adjacent the open sides of carriers located at said packing station, a reciprocable pusher element disposed adjacent said assembly conveyor at said assembly station for movement across said conveyor for engaging and pushing a row of articles from said conveyor into a said mold at rest at said assembly station, and pusher actuating means for repeatedly reciprocating said pusher element to feed a predetermined number of rows of articles into said mold to fill said mold, said pusher actuating means including electric devices engageable by and operable by articles fed into said molds for controlling the advancement of article filled molds.

15. A machine for packing articles into carriers, comprising in combination a mold rotatable on its own axis, means for feeding articles into said mold, said mold having an open side which is horizontally disposed when said articles are being fed into said mold, means for bodily moving said mold along a predetermined path of travel into a position adjacent a said carrier, gear means for rotating said mold on its axis to turn said open side to vertical position to align said side with the open side of said carrier, and reciprocable pusher means engageable with said articles for transferring the same from said mold to said carrier through said vertically disposed open side.

16. The machine of claim 15 having means for supporting said articles while they are being fed into said

mold and for retaining said articles in said mold while said mold is being rotated on its axis.

17. A machine for packing articles into carriers, comprising a mold rotatable on its own axis, means for feeding articles into said mold, said mold having an open side which is disposed at the bottom of said mold when said articles are being fed into said mold, means for bodily moving said mold along a predetermined path of travel into a position adjacent a said carirer, gear means for rotating said mold on its axis to align its open side with the open side of said carrier, and reciprocable pusher means engageable with said articles for transferring the same from said mold to said carrier through said open side.

18. The machine of claim 17 wherein means are provided for supporting said articles while they are being fed into said mold and for retaining said articles in said mold while said mold is being bodily moved into a position adjacent an open side of a said carrier.

19. The mechanism of claim 18 wherein said support and retaining means include a horizontal table having a curved horizontal extension disposed adjacent the path of travel of said mold.

References Cited in the file of this patent

UNITED STATES PATENTS

1,090,855	Jagenberg	Mar. 24, 1914
1,243,406	Hawthorne	Oct. 16, 1917
1,443,588	Otting	Jan. 30, 1923
2,179,648	Thayer	Nov. 14, 1939
2,506,819	Von Sydow	May 9, 1950
2,613,021	Bowes	Oct. 7, 1952
2,633,280	Davies	Mar. 31, 1953
2,675,184	Abbott et al.	Apr. 13, 1954
2,693,901	Olson et al.	Nov. 9, 1954
2,698,706	Geepfert et al.	Jan. 4, 1955