March 9, 1965 R. F. ANDERSON ETAL 3,172,435

CARTON FILLING MACHINE

Filed Dec. 31, 1962 5 Sheets-Sheet 1

Fig. 1

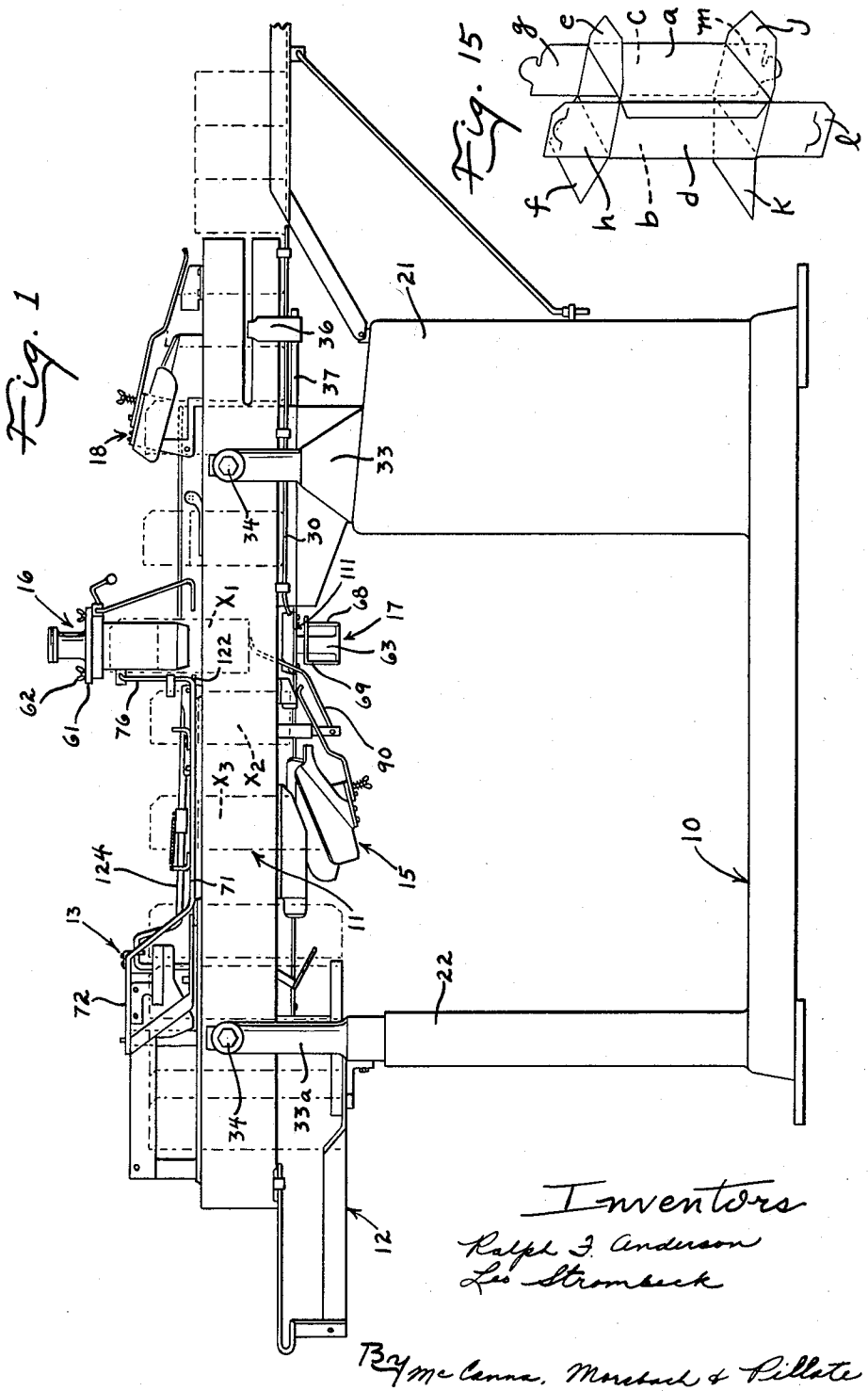



Fig. 15




Inventors
Ralph F. Anderson
Leo Stromseck

By McCanna, Morsbach & Pillote
Atty's

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Fig. 2

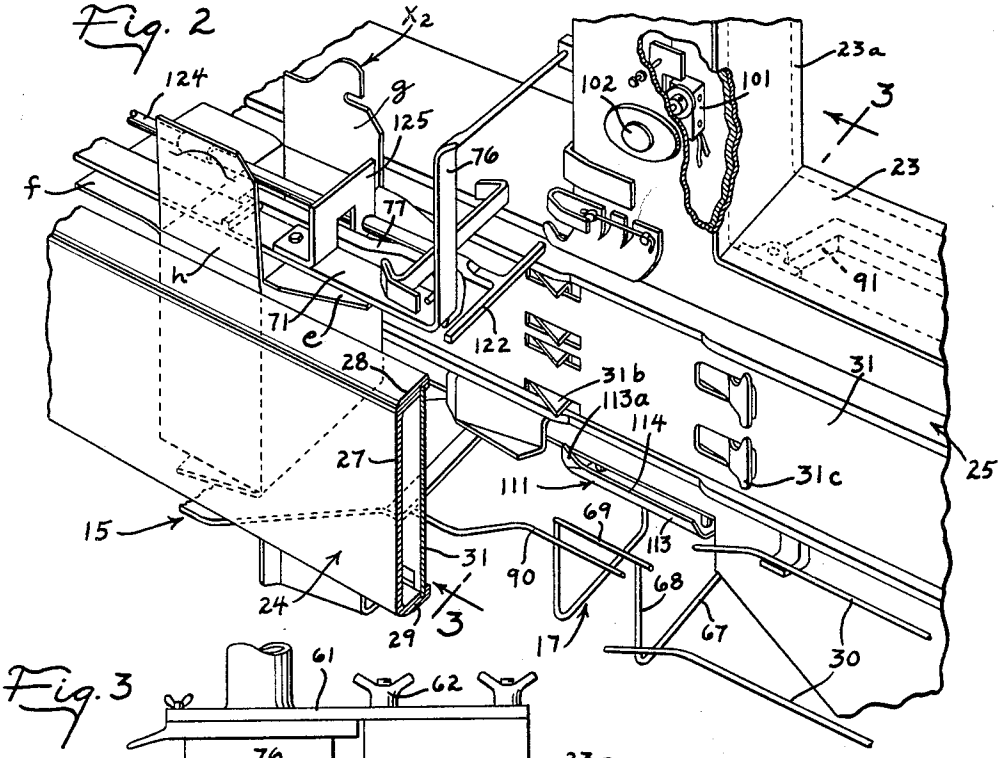



Fig. 3

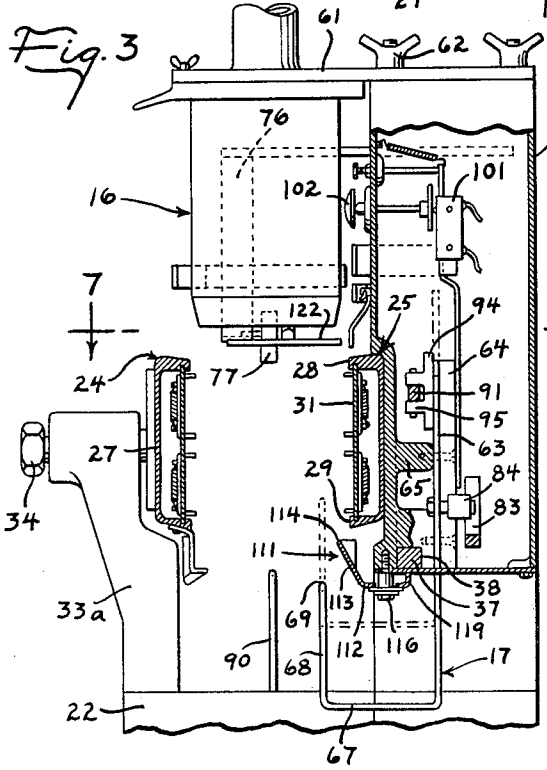



Fig. 4

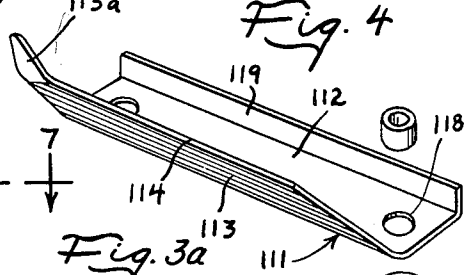
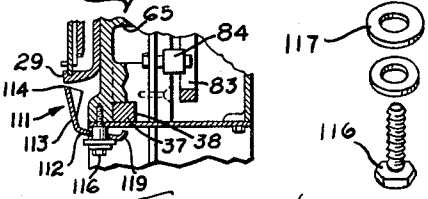



Fig. 3a







Inventors

Ralph F. Anderson

Leo Strombeck

By McCanna, Morsbach & Pillote

Atty's

March 9, 1965 R. F. ANDERSON ETAL 3,172,435

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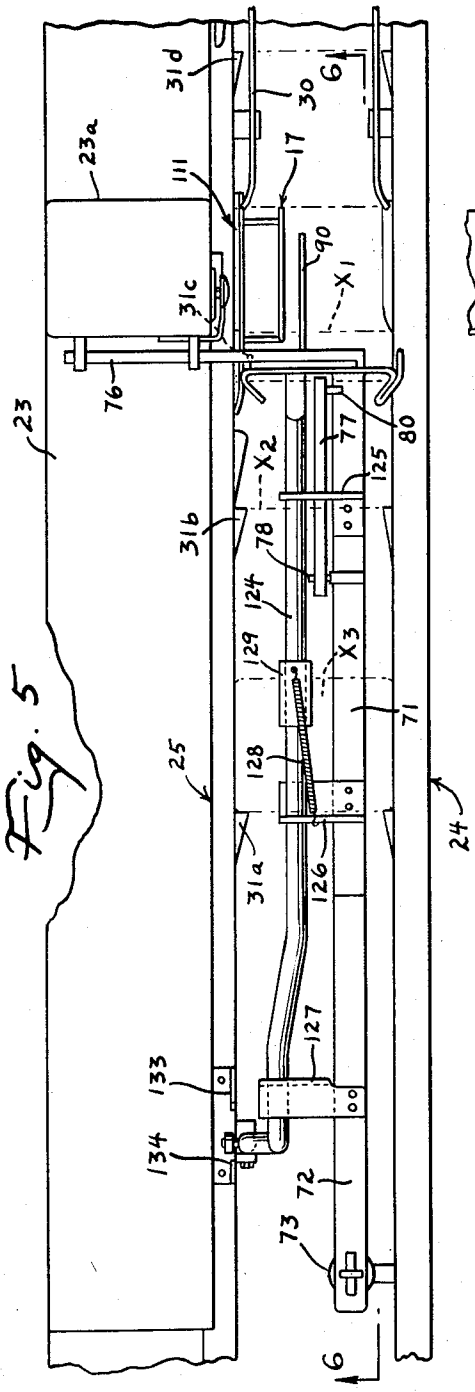



Fig. 5

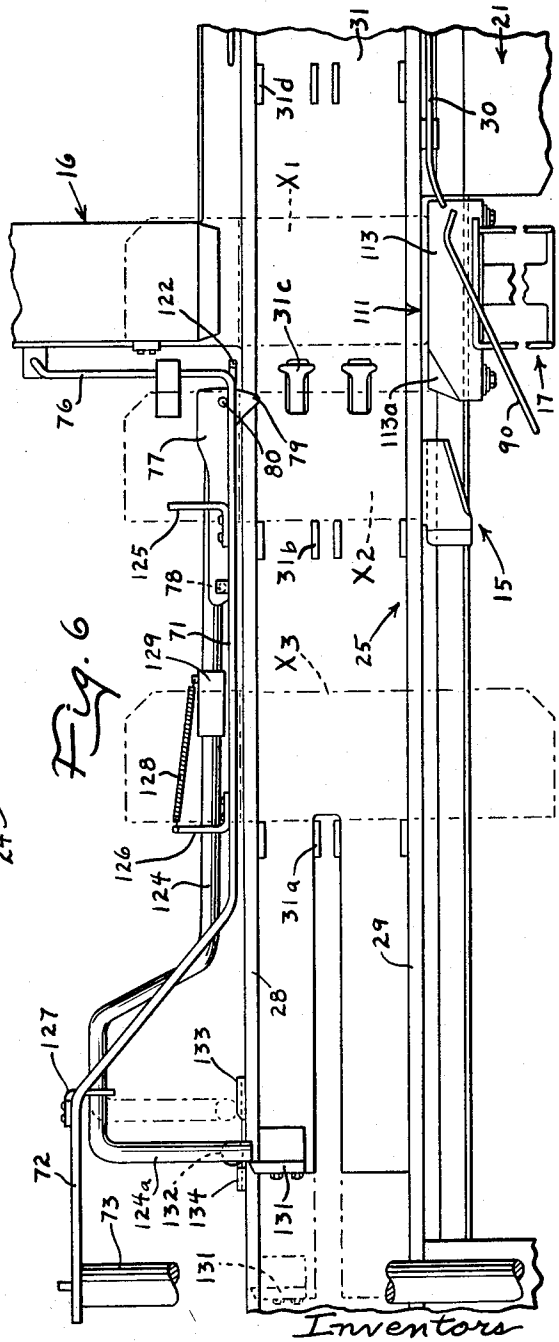



Fig. 6

Inventors
Ralph F. Anderson
Leo Stromsteck

By McCann, Morsbach & Pillote
Atty's

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Fig. 7

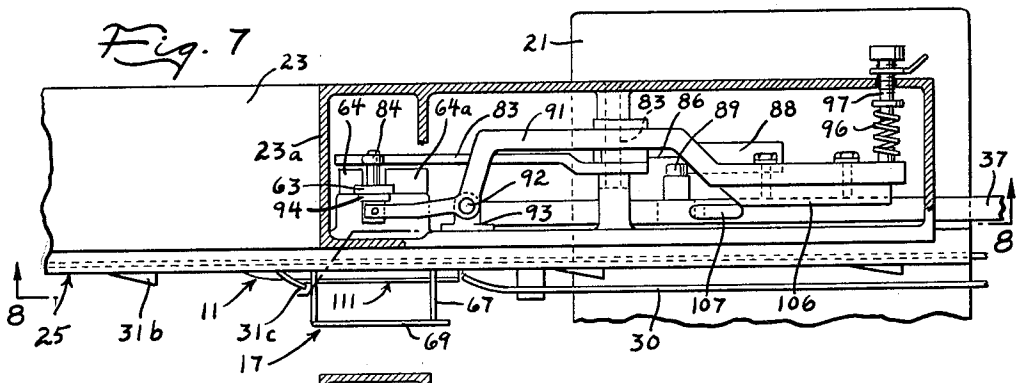



Fig. 8

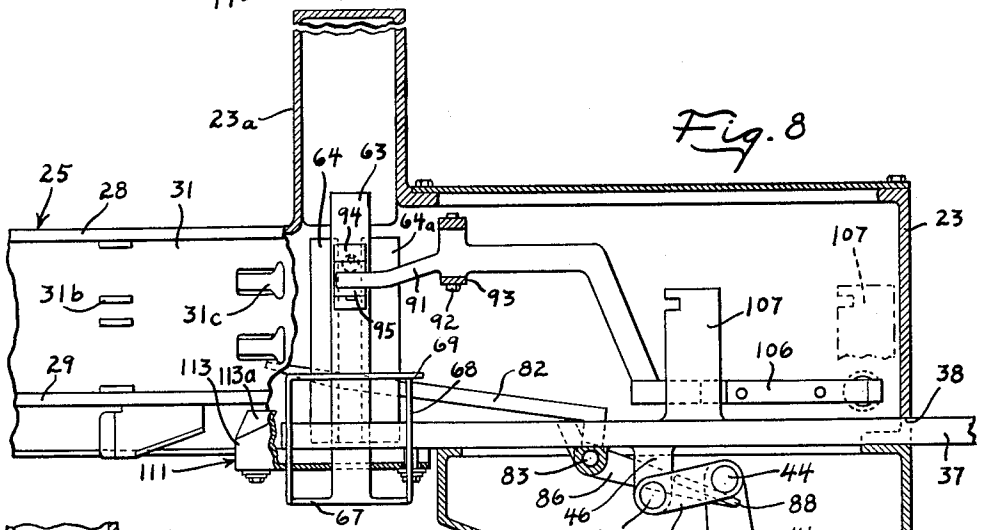
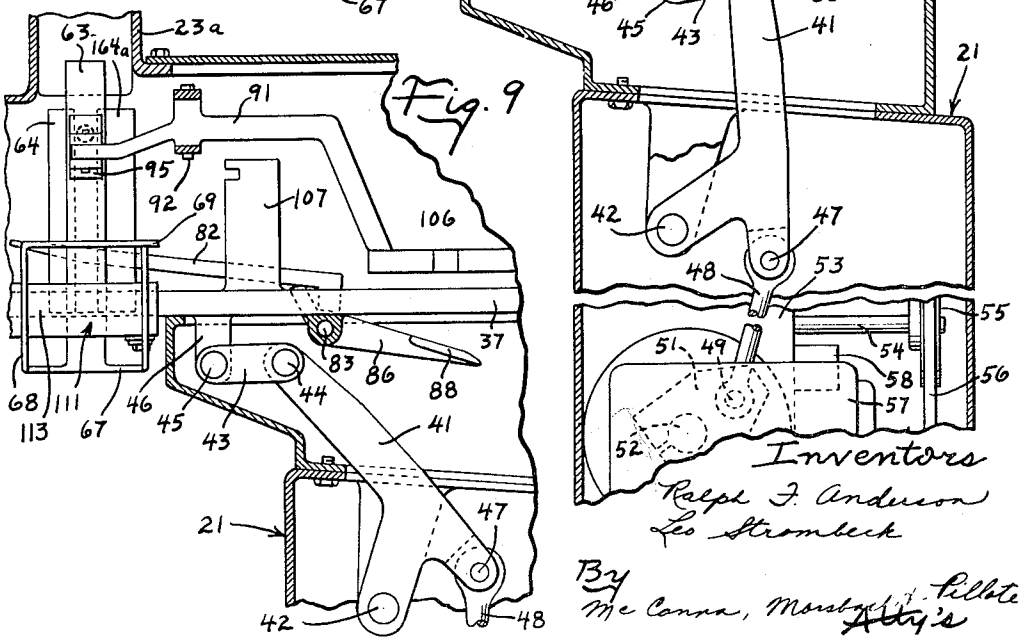



Fig. 9




Inventors

Ralph F. Anderson

Leo Stromberk

By McCanna, Morsbach, Pillote & Abby's

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Fig. 10

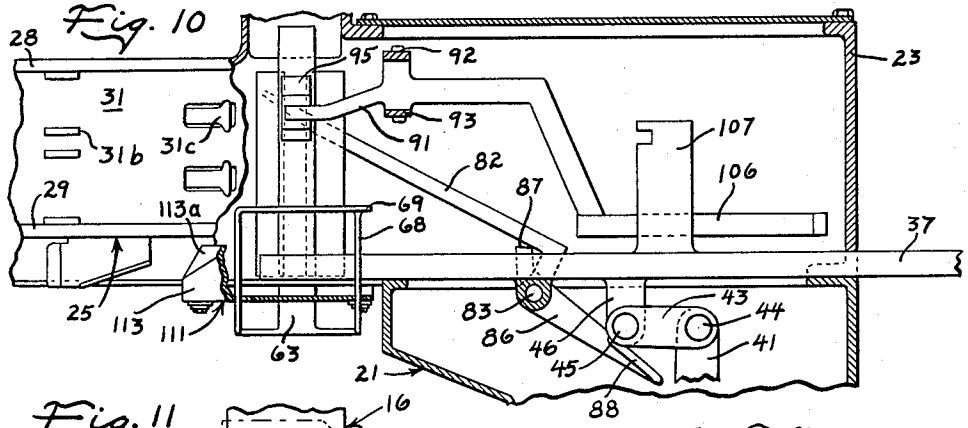



Fig. 11

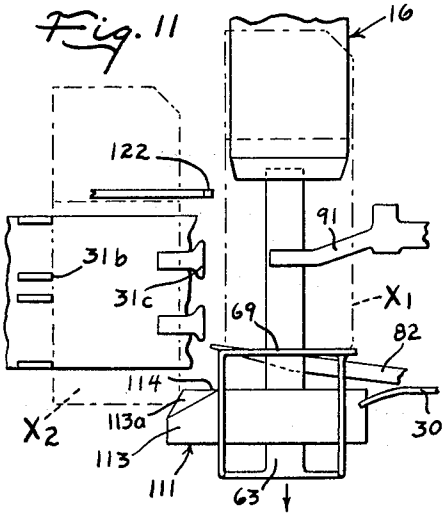



Fig. 12

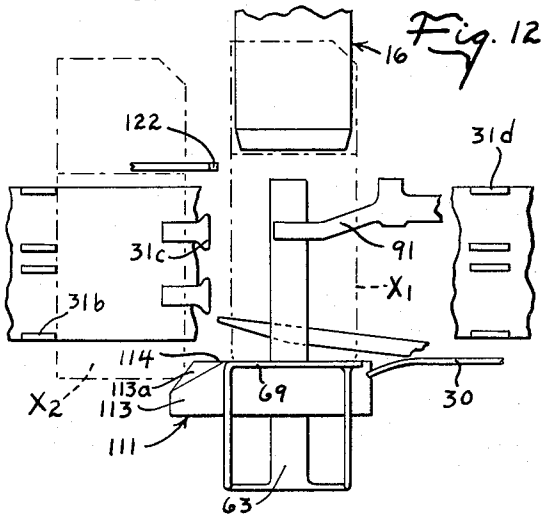



Fig. 13

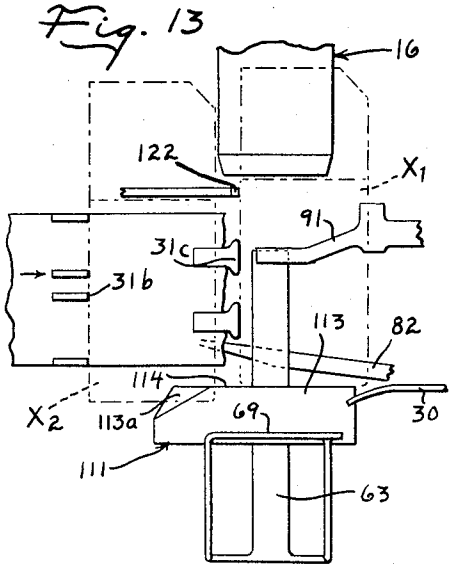
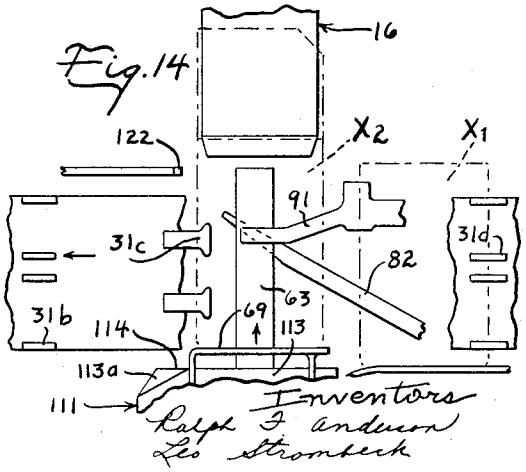



Fig. 14




Inventors
Ralph F. Anderson
Leo Stromberg

By McCanna, Morsbach & Pillate
Atty's

United States Patent Office

3,172,435
Patented Mar. 9, 1965



3,172,435

# CARTON FILLING MACHINE

Ralph F. Anderson, 332 Calvin Park Blvd., Rockford, Ill., and Leo Strombeck, Rockford, Ill.; said Strombeck assignor to said Anderson

Filed Dec. 31, 1962, Ser. No. 248,331
16 Claims. (Cl. 141—131)

This invention relates to improvements in apparatus for filling containers and particularly to an apparatus for filling containers with a semi-fluid plastic material such as ice cream, sherbet and the like.

The present invention is directed to a container filling apparatus of the type wherein a semi-fluid plastic material is continuously dispensed through a downwardly opening nozzle. Containers to be filled are advanced to a filling station below the nozzle at a level with the tops of the containers spaced below the nozzle to avoid interference with the material emerging from the nozzle. The containers are elevated at the filling station and moved downwardly as they are filled. When the top of the container reaches the lower end of the nozzle, the filled container is moved crosswise of the nozzle to shear the material in the container from the material in the nozzle. With this arrangement, the filled container, as it is moved away from the filling station, is at a level above the level at which the incoming empty containers are advanced to the filling station.

In such container filling machines, there is a tendency for the upper end of the container to tilt during movement of the container crosswise of the nozzle, particularly when the plastic material is relatively stiff. This produces an uneven product line in the container with some overfill in the container toward the trailing edge. When the top closure flaps are subsequently closed, some of this overfill is pressed out and onto the outer sides of the flaps. This has a deleterious effect on the overall package and, if the container is of the type having heat sealable closure flaps, the presence of product on the heat sealing faces of the flaps interferes with proper sealing of the container.

An important object of this invention is to provide an apparatus of the type described for filling containers having an improved arrangement for supporting the containers at the filling station to avoid tilting of the containers as they are moved crosswise of the nozzle to shear the material in the container from the material emerging from the nozzle.

Another object of this invention is to provide an apparatus for filling containers of the type described having an improved apparatus for supporting containers at the filling station, and which support apparatus allows the empty containers to move into position at the filling station at a lower level with their tops spaced below the lower end of the nozzle, and which support apparatus will underlie and support the filled container when the latter is filled and moves downwardly to a position in which the top of the container is adjacent the level of the lower end of the nozzle, to guidably support the container during movement of the container crosswise of the nozzle.

Another object of this invention is to provide a filling station of the type described having an improved apparatus for assisting movement of the filled container crosswise of the nozzle to aid in shearing the material in the container from the material emerging from the nozzle, and to prevent tearing or damage to the container during shearing of the material from the nozzle.

Yet another object of this invention is to provide a filling apparatus in accordance with the foregoing object and wherein the apparatus which aids in moving the container crosswise of the nozzle, also functions to



hold the trailing closure flap on the container out of engagement with the material emerging from the nozzle.

Still another object of this invention is to provide a filling apparatus of the type described having an improved arrangement for controlling downward movement of the container during filling, to support the container with a force sufficient to assure proper filling of the container, and which apparatus automatically allows the elevator to drop to a lower level for receiving an empty container as it is advanced to the filling station.

These, together with the other objects and advantages of this invention will be more readily appreciated as the same becomes better understood by reference to the following detailed description, when taken in connection with the accompanying drawings wherein:

FIG. 1 is a side elevational view of a carton erecting, folding, filling and closing machine, embodying the present invention;

FIG. 2 is a fragmentary perspective view of the machine of FIG. 1 and illustrating the container filling station;

FIG. 3 is a transverse sectional view through the carton erecting and folding apparatus taken on the plane 3—3 of FIG. 2;

FIG. 3*a* is a fragmentary sectional view taken on the plane 3—3 of FIG. 2 and illustrating the carton support member in a moved position;

FIG. 4 is an exploded perspective view of the apparatus for supporting the filled carton at the filling station;

FIG. 5 is a fragmentary plan view of the portion of the machine which advances the empty containers to the filling nozzle;

FIG. 6 is a fragmentary sectional view taken on the plane 6—6 of FIG. 5;

FIG. 7 is a fragmentary horizontal sectional view taken on the plane 7—7 of FIG. 3 and illustrating the apparatus for controlling movement of the container elevator;

FIG. 8 is a fragmentary vertical sectional view taken on the plane 8—8 of FIG. 7;

FIGS. 9 and 10 are fragmentary vertical sectional views taken on the plane 8—8 of FIG. 7 and illustrating the parts in different moved positions;

FIGS. 11, 12, 13 and 14 are diagrammatic views illustrating different moved positions of the apparatus; and

FIG. 15 is a perspective view of one type of carton which can be erected, filled and closed by the machine.

The present invention relates to improvements in folding and filling machines of the type shown in the patent to Swan F. Anderson, No. 2,612,016. The overall folding and filling machine is illustrated in FIG. 1 and, in general includes a frame structure 10; a transfer mechanism 11 for intermittently advancing cartons in stepped fashion; a hopper 12 for storing a stack of flattened cartons; carton opening and erecting mechanism 13 engageable with the cartons as they are moved off the stack by the transfer mechanism, for opening and squaring the cartons; a lower flap folder mechanism 15 for enfolding and closing the lower flaps on the cartons as they are advanced by the transfer mechanism, a filler nozzle 16; an elevator mechanism 17 for elevating the containers at the filler station and around the nozzle; and an upper flap folding mechanism 18 for folding and closing the upper flaps on the carton. The transfer mechanism operates to intermittently remove a flattened carton from the stack on the hopper 12 and advance it past the carton erecting apparatus 13 to open and square the carton. The cartons are thereafter advanced past the lower flap folding mechanism 15 to fold and close the bottom flaps and the partially closed containers are then advanced to the filling station below the nozzle 16. In order to avoid interference with the material emerging from the nozzle, the cartons are advanced to the filling station at a level with

the tops of the cartons spaced somewhat below the nozzle. The cartoons are then raised at the filling station by the elevator 17 and moved downwardly as the cartons fill. When the cartons move down to a position in which the top of the carton is adjacent the lower end of the nozzle, the cartons are moved crosswise of the nozzle to shear off material in the container from the material emerging from the nozzle, and the cartons are thereafter advanced past the top flap folding mechanism 18 to close the top of the carton.

The details of construction of the carton hopper 12, the carton erecting mechanism 13, and the lower and upper flap folding mechanisms 15 and 18 form no part of the present invention and may be of any suitable construction for performing the above described operations, and may, for example, be of the type disclosed in the aforementioned patent to Anderson. The particular construction and arrangement of the lower and upper flap folding mechanisms will, of course, vary with different types of cartons having different flap shapes and arrangements. Further detailed description of the erecting and flap folding apparatus is deemed unnecessary.

Referring more specifically to the accompanying drawings, the frame structure 10 includes an enclosed housing 21 adjacent one end of the frame and a pedestal 22 adjacent the other end. The frame structure also includes a generally horizontally extending casing 23 which is mounted on the upper ends of the housing 21 and the post 22 and extends therebetween. The transfer mechanism includes front and rear sections 24 and 25 which are laterally spaced apart to guidably engage and support the cartons therebetween. The front and rear sections are similarly constructed and each include a generally U-shaped rail 27 having top and bottom guide flanges 28 and 29 and a pusher plate 31 supported for reciprocation on the top and bottom flanges. The rear section of the transfer mechanism 25 is conveniently attached to the horizontally extending casing 23 of the frame structure, and the front section 24 is supported on the housing 21 and post 22 by brackets 33 and 33*a* and adjusting screws 34, for lateral adjustment toward and away from the rear section. The pusher plate 31 on the front section of the transfer mechanism has a stripper bar (not shown) which engages the end carton in the stack carried by the carton hopper 12 and which moves the end carton off the stack and past the carton erecting apparatus 13. The pusher plates have a plurality of pusher fingers mounted at longitudinally spaced points therealong and yieldably urged laterally of the slide plates into the path of movement of the cartons. As shown in FIGS. 5 and 6, opposed pairs of pusher fingers 31*a*, 31*b*, 31*c* and 31*d* are provided for advancing the cartons in step fashion from the erecting mechanism past the filling station below the nozzle 16, and additional pairs of pusher fingers (not shown) are provided for advancing the filled cartons from the outlet end of the filling station, past the upper flap folding apparatus 18 and out of the machine. The pusher plates on the front and rear sections of the transfer mechanism are interconnected adjacent their outlet end by a yoke 36 (see FIG. 1), and which yoke is connected to a slide bar 37 mounted in a guideway 38 in the casing 23. As shown in FIG. 8, a bell crank 41 is pivotally mounted at 42 on the housing 21, and a link 43 is connected by pins 44 and 45 to the bell crank and to an ear 46 on the slide bar 37 to reciprocate the latter in response to oscillation of the bell crank. The bell crank is otherwise connected by a pin 47 and link 48 to a pin 49 on a crank arm 51 connected to the output shaft 52 of a one revolution clutch 53. The clutch has an input shaft 54 which is connected through a belt and pulley arrangement 55 and 56 to a drive motor 57. The clutch is normally disengaged and has an actuator 58, conveniently of the electrical type, which is operative when energized to drivingly connect the input shaft 54 to the output shaft 52, to drive the latter through one revolution, and then stop. As shown in FIGS. 7 and 8, the crank 41 and slide 37 are in their initial position, that is the position assumed when the clutch 53 is disengaged. When the slide 37 is in its initial position, it is intermediate the ends of its stroke and, when the clutch 53 is operated, the output shaft 52 is rotated in a clockwise direction as viewed in FIG. 8 to sequentially extend the slide to the right; retract the slide past the initial position to a retracted position, and then return the slide to its initial position.

The casing 23 has an upwardly extending portion 23*a* at the filling station and the nozzle 16 is detachably supported on the upper end of the extension 23*a* as by a plate 61 and fasteners 62. The elevator 17 at the filling station includes a vertically extending slide bar 63 which is slidably mounted in grooved guideways 64 and 64*a* secured to rearwardly extending bosses 65 on the casing 23*a*. The slide bar has a forwardly extending portion 67 at its lower end and an upwardly extending portion 68 having a generally horizontally extending carton engaging member 69 thereon.

The containers to be filled by the machine are the type best shown in FIG. 15 and which include front and rear walls *a* and *b* and opposed side walls *c* and *d*. Front and rear top closure flaps *e* and *f* and top side flaps *g* and *h* are articulated to the carton at the upper end, and lower front and rear closure flaps *j* and *k* and opposed lower side flaps *l* and *m* are provided at the lower end of the carton. In the form shown, the side flaps at the upper and lower ends of the cartons are arranged to interlock to maintain the flaps in a closed position, it being understood that a different arrangement for holding the flaps closed, such as an adhesive or a heat sealable material, may be provided on the closure flaps to hold the same in a closed position.

The laterally spaced sections 24 and 25 of the transfer mechanism are adjusted relative to each other so that the opposed upper and lower guide flanges 28 and 29 engage the opposed sides *c* and *d* of the cartons and support the same during movement by the pusher plates. In order to provide clearance between the top of the carton and the material emerging from the nozzle 16 as the cartons are advanced to the filling station, the cartons are supported with the upper edges of the body walls spaced somewhat below the lower end of the nozzle 16 as shown in FIGS. 6 and 11–14. When the filled cartons are moved across the nozzle and away from the filling station, they are disposed at a level above the incoming cartons and with the upper ends of the cartons closely adjacent the underside of the nozzle so that the carton wipes across the nozzle and shears the material in the carton from the material emerging from the nozzle. Carton support rails 30 are provided at the outlet side of the filling station at a level below the nozzle substantially equal to the height of a container to support the filled containers as they are advanced from the filling station. As the cartons are advanced to the filling station, the lower flaps *j–m* are infolded and closed to close the lower end of the carton by the aforementioned flap folding mechanism 15, and the lead and trail flaps *e* and *f* on the upper end of the carton are respectively folded forwardly and rearwardly as best shown in FIG. 2. A flap guide strap 71 has one end 72 mounted on a post 73 at a level above the upper ends of the carton flaps on the carton hopper 12, and the guide strap extends downwardly to a level adjacent the upper ends of the body walls of the carton as best shown in FIGS. 2 and 6, to guide the upper lead and trail flaps *e* and *f* respectively forwardly and rearwardly. The other end of the strap is supported by a generally L-shaped bracket 76 on the upwardly extending portion 23*a* of the casing. As best shown in FIGS. 5 and 6, a weighted flap presser member 77 is provided and, as shown, is pivotally mounted at 78 on the hold down bar 71. The member 77 has a finger portion 79 at its outer end arranged to engage the lead and trail flaps on the carton to depress the same as the carton enters the filling

station. A stop 80 is provided on the member 77 and arranged to engage the bar 71 to limit downward swinging movement of the flap presser member.

As the empty cartons enter the filling station below the nozzle 16, the elevator 17 is operated to lift the filled container into at least partial telescoping relation with the nozzle. As best shown in FIGS. 7–10, the elevator lifting mechanism includes a lift arm 82 which is pivotally supported on a pivot pin 83 carried by the housing 21. The arm engages a roller 84 on the slide bar 63 to raise the elevator when the arm 82 is raised. A cam arm 86 is also pivotally mounted on the pin 83 and has a finger 87 arranged to engage the lift arm 82 when the cam arm is moved downwardly. The cam arm has a cam plate 88 adjacent its free end, and which cam plate is disposed in the path of travel of a roller 89 (FIG. 7) which moves with the slide 37 and is conveniently carried by the pivot pin 34. Thus, when the slide 37 is extended to the right from its initial position shown in FIG. 8 and then retracted to the left, the roller 89 engages the cam plate 88 and depresses the cam arm to elevate the lift arm 82 and thereby raise the elevator. As the slide continues retraction, that is movement toward the left as viewed in FIGS. 8–10, the roller moves past the cam plate and allows the cam arm 46 to move upwardly and the lifter arm to move downwardly. A lower flap holding finger 90 is preferably provided at the filling station and is yieldably urged upwardly to engage the lower carton flaps and hold them in a closed position during filling.

The elevated carton is forced downwardly by the material flowing from the nozzle into the carton. In accordance with the present invention, a brake mechanism is provided for yieldably opposing downward movement of the elevator and the carton carried thereby. As best shown in FIGS. 7–10, the brake mechanism includes a brake arm 91 which pivotally mounted intermediate its ends on a pin 92 on a bracket 93 attached to the casing 23. A brake block 94 is supported, as by lateral ears 95, on one end of the brake arm 91, and the brake block is arranged to frictionally engage the slide member 63 of the elevator. The arm 91 is yieldably urged by a spring 96 (FIG. 7) in a direction to press the brake block against the slide member and an adjusting screw 97 is threaded into the casing 23 and engages the spring to enable selective adjustment of the braking pressure. A switch 101 having a detector finger 102 is provided for controlling operation of the clutch actuator 58. The switch is of the normally closed type and the detector finger 102 is positioned so as to engage the upper side flap *g* on the carton, when the top of the carton is above the lower edge of the nozzle so that the clutch is operated to stop the transfer mechanism while the carton is elevated and while it is being filled. As soon as the filled carton moves down to a level with its top adjacent the lower end of the nozzle, the flap *g* moves out of engagement with the switch finger 102 and the switch is allowed to close and reengage the clutch to thereby operate the transfer mechanism and move the filled carton crosswise of the nozzle.

As previously noted, the filled cartons are moved away from the filling station at a slightly higher lever than the incoming empty cartons, and the carton support rails 30 are provided at the outlet side of the filling station and spaced below the nozzle a distance approximately equal to the height of a carton to support the filled carton at the proper level. Since the incoming cartons are advanced to the filling station at a level somewhat below the level at which the filled cartons are moved away from the filling station, it is necessary to drop the elevator somewhat in order to allow the succeeding empty carton to advance to the filling station. For this purpose, a cam 106 is attached to the brake arm 91 and positioned to engage a cam actuator 107 attached to the slide 37. Thus, as the slide is extended from the position shown in FIGS. 7 and 8 to move the filled cartons across the nozzle, the cam actuator 107 engages the cam 106 on the brake arm to move the same in a direction to release the brake and allow the elevator to drop to its lowered position. During the subsequent retraction of the slide back toward its initial position, and while the roller 89 engages the cam face 88 to raise the elevator 17, the actuator retains the brake mechanism in its release position to allow free upward movement of the elevator. The actuator 107 releases the brake arm when the elevator is in its raised position so as to apply the controlled braking pressure to the elevator during the subsequent filling of the carton.

As the top of the carton is moved crosswise of the nozzle, it shears the material in the carton from the material emerging from the nozzle. However, this shearing of the material produces an additional drag at the top of the carton and tends to cause the upper end of the carton to tilt rearwardly relative to the carton travel during movement of the carton away from the filling station. Rearward tilting of the carton has been markedly reduced if not eliminated by the provision of a carton support 111 at the filling station which is so arranged as to engage and support the underside of the filled carton during movement of the carton crosswise of the nozzle. The carton support comprises an elongated member having a generally L-shaped cross section and includes a generally horizontal mounting leg 112 and an upwardly extending support leg 113 which terminates in a generally horizontal carton support surface 114. The support member is supported for tilting movement in a direction crosswise of the path of travel of the cartons into and out of its support position shown in FIG. 3. As best shown in that figure, the support member is mounted at the underside of the casing 23 by spaced fasteners 116. The fasteners have a washer 117 thereon forming a laterally enlarged portion which underlies the mounting portion 112, and the fasteners extend loosely through openings 118 in the mounting portion. A flange 119 at the rear side of the mounting portion extends upwardly into engagement with the underside of the casing 23 and forms a fulcrum for the support member. The support member is normally supported in the position shown in FIG. 3 and rests on the washers 117 with its upper edge 114 disposed between the front and rear sections 24 and 25 of the transfer mechanism. The upper edge of the support member 111 is spaced below the nozzle a distance approximately equal to the height of a carton, so as to engage the underside of a carton and support the same when the top of the carton is disposed adjacent the lower end of the nozzle, to guide the same during movement crosswise of the nozzle. The support leg 113 has a cam portion 113*a* adjacent the inlet which is arranged to engage the empty carton as it is advanced to the filling station, to cam the upwardly extending leg 113 of the support member laterally and thereby tilt the support member to the position shown in FIG. 3*a* in which the support leg 113 is shifted laterally out of the path of movement of the cartons, to thereby allow the empty carton to advance to the filling station. When the empty carton is thereafter raised by the elevator, the support member is gravitationally urged downwardly to the position shown in FIG. 3 whereby the support leg 113 moves inwardly into underlying relation with the carton to support the same. The support member forms a firm and positive guide for the underside of the carton and inhibits tilting movement of the carton during movement of the same crosswise of the nozzle.

An assist pusher is also preferably provided to aid in moving the top of the carton crosswise of the nozzle, particularly when packaging relatively stiff materials. The assist pusher comprises a pusher member 122 which extends crosswise between the front and rear sections 24 and 25 of the transfer mechanism, at a level closely adjacent the level of the lower end of the nozzle. As best shown in FIGS. 5 and 6, the pusher member is mounted on an elongated rod 124 which is slidably supported in spaced brackets 125, 126 and 127 conveniently

attached to the flap hold-down bar 71. The pusher member is yieldably urged to a retracted position by a spring 128 attached to one of the brackets 126 and to an adjustable collar 129 on the rod 124. Provision is made for moving the rod in timed relation with the transfer mechanism to aid in moving the top of the carton crosswise of the nozzle. As shown, the rod has a depending finger portion 124*a*, and an actuator 131 is mounted on the pusher plate 31 for movement therewith, and is positioned to engage the lower end of the finger portion 124*a* to move the pusher with the transfer mechanism. The parts are so arranged that the pusher member 122 engages the rear side *b* of the carton adjacent the upper edge thereof at substantially the same time as the fingers 31*c* on the pusher plate engage the rear side of the carton to aid in pushing the carton crosswise of the nozzle. The pusher member is arranged for movement only part way across the nozzle, so as to avoid interference with the stream of material emerging from the nozzle. For this purpose, the finger portion 124*a* of the pusher member has a follower roller 132 which is engageable with a stationary cam 133, and which cam lifts the finger portion 124*a* out of engagement with the actuator 131, after the pusher member has moved a short distance sufficient to start movement of the carton across the nozzle. The spring 128 then operates to retract the pusher member away from a position below the nozzle, and until the roller 132 engages a stationary stop 134. As shown in FIG. 5, the cam 133 and stop 134 are conveniently mounted on the rail of the rear section 25 of the transfer mechanism.

From the foregoing it is thought that the operation and construction of the machine will be readily understood. For convenience in describing the operation, it is assumed that the parts are in their initial position reached when the one revolution clutch is disengaged and the transfer mechanism stops. At that time, the pusher plates are positioned as shown in FIGS. 5, 6, 7, 8 and 11 and an empty carton designated X1 has been elevated into partial telescoping relation with the nozzle 16. The pusher fingers 31*b* engage a succeeding carton designated X2 and the pusher fingers 31*a* engage a second succeeding carton designated X3. When the slide 37 is in its initial position shown in FIG. 8, the cam actuator 107 is out of engagement with the cam 106 on the brake arm 91 so that the brake is yieldably urged into engagement with the slide 63 on the elevator to retard downward movement of the elevator. As the carton is filled, the material forces the carton and elevator downwardly against the frictional resistance of the brake 94 until the upper edge of the carton X1 reaches a level adjacent the lower end of the nozzle 16 as shown in FIG. 12. At that time, the underside of the carton comes to rest on the support surface 114 on the carton support member 111. Simultaneously, the upper flap *g* on the carton X1 moves out of engagement with the switch finger 102 and allows the switch to close to energize the clutch operator 58 and drive the clutch output shaft 52 through one revolution. The shaft 52 rotates in a clockwise direction as viewed in FIG. 8 and sequentially moves the slide 37 from its initial position shown in FIG. 8 forwardly a distance somewhat greater than the width of a carton until the cam actuator 107 reaches the position shown in phantom in FIG. 8; rearwardly through the initial position to a retracted position spaced from the initial position a distance greater than the width of a carton as shown in FIG. 9; and then forwardly to its initial position. During the initial forward movement of the slide, the pusher fingers 31*c* engage the filled carton at the filling station and move the same crosswise of the nozzle as shown in FIG. 13. At substantially the same time, the actuator 131 on the pusher plate operates to move the assist pusher 122 therewith to aid in moving the carton crosswise of the nozzle. As previously described, the cam 133 disengages the finger 124*a* on the rod 124 from the actuator 131, after the pusher member has moved part way across the nozzle, to allow the same to retract out of the way of the material emerging from the nozzle. As the slide 37 is extended, the actuator 107 on the slide engages the cam 106 on the brake arm 91 to release the brake and allow the elevator to move downwardly to a level below the level of the incoming cartons. Thus, the succeeding carton X2 which is advanced to the filling station by the fingers 31*b*, can move to the filling station in overlying relation to the elevator 17. The lower ends of the incoming cartons are at a level below the support surface 114 on the support member 111 and the carton X2 engages the cam portion 113*a* on the support member and cams the latter to one side as it moves to the filling station.

During the initial retraction of the slide 37, the actuator 107 remains in engagement with the cam 106 to retain the brake 94 in its release position. At that time, the roller 89 engages the cam plate 88 on the cam arm 86 to elevate the lift arm 82 and the elevator 17 as shown in FIGS. 10 and 14. The actuator 107 then releases the cam 106 and hence releases the brake 94 to hold the elevator in its raised position. When the elevator raises the carton at the filling station, the support member 111 swings to its normal position shown in FIG. 3 to underlie the carton and support the same when it is filled and while it is being moved across the nozzle. The slide 37 continues retracting beyond its initial position to its full retracted position shown in FIG. 9, at which time the fingers 31*b* pick up a succeeding carton X3 (FIG. 6). During the subsequent forward movement of the slide back to its initial position, the fingers 31*b* advance the succeeding carton X3 to a position in advance of the filling station and the machine then repeats the cycle described.

We claim:

1. In an apparatus for filling containers including a downwardly opening dispensing nozzle for continuously dispensing a stream of plastic material, transfer means for advancing containers along a path crosswise of the nozzle to feed empty containers to a filling station below the nozzle and for moving filled containers away from the filling station, container guide means supporting the empty containers with their upper edges spaced below the lower end of the nozzle as the containers are advanced by the transfer means to the nozzle to provide clearance between the top of the container and the material emerging from the nozzle, means at the filling station for elevating a container into position around the nozzle, container support means having a generally horizontal container supporting surface spaced below said nozzle a distance approximately equal to the height of a container, means mounting said container support means for movement laterally of the path of travel of the containers as they are advanced by said transfer means, said container support means including means engageable with an empty container as it is advanced to the filling station for moving the support means laterally out of the path of the container, said container support means being yieldably urged into a position underlying the container when the container is elevated at the filling station whereby the support means engages and supports the underside of the container when it thereafter moves downwardly to a position with its top adjacent the lower end of the nozzle to support the filled container as it is advanced by the transfer means crosswise of the nozzle.

2. In an apparatus for filling containers including a frame, a downwardly opening dispensing nozzle mounted on the frame, spaced lateral container guide means mounted on the frame and extending crosswise of the nozzle for laterally guiding the containers along a path below the nozzle, transfer means for advancing empty containers along the lateral container guide means to a filling station below the nozzle and for moving filled containers away from the filling station, said guide and transfer means supporting the empty containers as they are advanced

to the filling station with their upper edges spaced below the lower end of the nozzle to provide clearance between the top of the container and the material emerging from the nozzle, elevating means at the filling station movable between an initial position spaced below the nozzle a distance greater than the height of a container and a raised position elevating a container into position around the nozzle, container support means having a generally horizontal container supporting surface, means mounting said support means on the frame for movement laterally of said guide means into and out of a container support position therebetween with said container supporting surface spaced below the lower end of the nozzle a distance approximately equal to the height of a container, said container support means having means engageable with an empty container as it is advanced by the transfer means to the filling station for moving the support means laterally out of its support position between the guide means, said container support means being yieldably urged to its container support position to underlie the container when the container is elevated whereby the support means engages and supports the underside of the container when it thereafter moves downwardly to a position with its top adjacent the lower end of the nozzle to support the filled container as it is advanced by the transfer means crosswise of the nozzle.

3. In an apparatus for filling container including a frame, a downwardly opening dispensing nozzle mounted on the frame, spaced lateral container guide means mounted on the frame and extending crosswise of the nozzle for laterally guiding the containers along a path below the nozzle, transfer means for advancing empty containers along the lateral container guide means to a filling station below the nozzle and for moving filled containers away from the filling station, said guide and transfer means supporting the empty containers as they are advanced to the filling station with their upper edges spaced below the lower end of the nozzle to provide clearance between the top of the container and the material emerging from the nozzle, elevating means at the filling station movable between an initial position spaced below the nozzle a distance greater than the height of a container and a raised position elevating a container into position around the nozzle, the improvement comprising an elongated container support member having a generally L-shaped cross section and including a generally horizontal mounting leg and a support leg extending upwardly and inwardly from the mounting leg, means attaching said mounting leg to said frame for tilting movement of the support member between a container supporting position in which the support leg projects inwardly between the lateral guide means with its upper edge spaced below the lower end of the nozzle a distance approximately equal to the height of the container and a retracted position disposed outwardly of the lateral guide means, said support leg having a cam portion engageable with the empty containers as they are advanced to the filling station for tilting the support member to its retracted position, said support member being gravity urged to its container supporting position whereby the support member moves to its supporting position when the container is elevated at the filling station to engage and support the underside of the container when the latter moves downwardly to a position with the top of the container adjacent the lower end of the nozzle.

4. In an apparatus for filling containers including a downwardly opening dispensing nozzle, transfer means for advancing containers along a path crosswise of the nozzle, container guide means supporting the empty containers with their upper ends spaced below the nozzle as the containers are advanced by the transfer means to the nozzle to provide clearance between the top of the carton and the material emerging from the nozzle, an elevator at the filling station movable between an initial position spaced below the nozzle a distance sufficiently greater than the height of a container to allow an empty container to move onto the elevator and a raised position elevating a container into position around the nozzle, said elevator including a slide member reciprocable therewith, brake means engageable with the slide member for retarding downward movement of the elevator to yieldably oppose downward movement of the container during filling, means operative when the container moves down to a position with the top of the container adjacent the lower end of the nozzle for operating said transfer means to move the filled container crosswise of the nozzle and shear the material in the container from the material in the nozzle, and means operated in timed relation with the movement of said transfer means for releasing said brake means to allow the elevator to move back to its initial position for receiving a subsequent container.

5. The combination of claim 4 including means for adjusting the pressure applied by the brake means to the slide member to thereby regulate the resistance to downward movement of the elevator.

6. In an apparatus for filling containers including a frame structure, a downward opening dispensing nozzle mounted on the frame structure, transfer means mounted on the frame structure for advancing containers along a path crosswise of the nozzle, container guide means supporting the empty containers with their upper ends spaced below the nozzle as the containers are advanced by the transfer means to the nozzle to provide clearance between the top of the container and the material emerging from the nozzle, an elevator at the filling station movable between an initial position spaced below the nozzle a distance sufficiently greater than the height of a container to allow an empty container to move onto the elevator and a raised position elevating a container into position around the nozzle, said elevator including a slide member reciprocable therewith and slidably mounted on said frame structure, brake means engageable with said slide member for retarding downward movement of the elevator to yieldably oppose downward movement of the container during filling, means yieldably urging said brake means into engagement with said slide member, means operative when the container moves down to a position with the top of the container adjacent the lower end of the nozzle for operating said transfer means to move the filled container crosswise of the nozzle and shear the material in the container from the material in the nozzle, and cam means reciprocable with said transfer means and engageable with said brake means to release the brake means after the filled container has been moved off the elevator and before the next succeeding container has advanced to the filling station.

7. The combination of claim 6 wherein said brake means includes a lever pivotally mounted intermediate its ends on said frame structure and having a brake element on one end engageable with the slide member and means adjacent its other end for yieldably urging the lever in a direction to press the brake element against the slide member.

8. In an apparatus for filling containers including a frame structure, a downward opening dispensing nozzle mounted on the frame structure, transfer means mounted on the frame structure for advancing containers along a path crosswise of the nozzle, container guide means supporting the empty containers with their upper ends spaced below the nozzle as the containers are advanced by the transfer means to the nozzle to proivde clearance between the top of the container and the material emerging from the nozzle, an elevator at the filling station movable between an initial position spaced below the nozzle a distance sufficiently greater than the height of a container to allow an empty constainer to move onto the elevator and a raised position elevating a container into position around the nozzle, said elevator including a slide member reciprocable therewith and slidably mounted on said

frame structure, brake means engageable with said slide member for retarding downward movement of the elevator to yieldably oppose downward movement of the container during filling, means yieldably urging said brake means into engagement with said slide member, means operative when the container moves down to a position with the top of the container adjacent the lower end of the nozzle for operating said transfer means to move the filled container crosswise of the nozzle and shear the material in the container from the material in the nozzle, and means operative during raising of said elevator and also operative after said elevator has moved down to a position with the top of the container adjacent the lower end of the nozzle for releasing said brake means.

9. In an apparatus for filling containers including a frame structure, a downward opening dispensing nozzle mounted on the frame structure, transfer means mounted on the frame structure for advancing containers along a path crosswise of the nozzle, container guide means supporting the empty containers with their upper ends spaced below the nozzle as the containers are advanced by the transfer means to the nozzle to provide clearance between the top of the container and the material emerging from the nozzle, an elevator at the filling station movable between an initial position spaced below the nozzle a distance sufficiently greater than the height of a container to allow an empty container to move onto the elevator and a raised position elevating a container into position around the nozzle, said elevator including a slide member reciprocable therewith and slidably mounted on said frame structure, container support means having a generally horizontal container supporting surface spaced below said nozzle a distance approximately equal to the height of the container, means mounting said container support means on said frame structure for movement laterally of the container guide means into and out of the path of travel of the containers, said container support means including means engageable with an empty container as it is advanced to the filling station for moving the support means laterally out of the path of the container, said container support means being yieldably urged into a position underlying the container when the container is elevated at the filling station whereby the support means engages and supports the underside of the container when it is thereafter lowered, brake means engageable with said slide for retarding downward movement of the elevator during filling of the container, means operative when the container is lowered to a position adjacent said container support means for operating said transfer means to move a filled container crosswise of the nozzle, and means operative when said transfer means moves the filled container crosswise of the nozzle for releasing said brake means.

10. In an apparatus for filling containers including a frame structure, a downward opening dispensing nozzle mounted on the frame structure, transfer means mounted on the frame structure for advancing containers along a path crosswise of the nozzle, container guide means supporting the empty containers with their upper ends spaced below the nozzle as the containers are advanced by the transfer means to the nozzle to provide clearance between the top of the container and the material emerging from the nozzle, an elevator at the filling station movable between an initial position spaced below the nozzle a distance sufficiently greater than the height of a container to allow an empty container to move onto the elevator and a raised position elevating a container into position around the nozzle, said elevator including a slide member reciprocable therewith and slidably mounted on said frame structure, container support means having a generally horizontal container supporting surface spaced below said nozzle a distance approximately equal to the height of the container, means mounting said container support means on said frame structure for movement laterally of the container guide means into and out of the path of travel of the containers, said container support means including means engageable with an empty container as it is advanced to the filling station for moving the support means laterally out of the path of the container, said container support means being yieldably urged into a position underlying the container when the container is elevated at the filling station whereby the support means engages and supports the underside of the container when it is thereafter lowered, brake means engageable with said slide for retarding downward movement of the elevator during filling of the container, means operative when the container is lowered to a position adjacent said container support means for operating said transfer means to move a filled container crosswise of the nozzle, and means operative during raising of said elevator and also operative after said elevator has moved down to the level of said container support means for releasing said brake means to allow the elevator to return to its initial position.

11. In an apparatus for filling containers including a downwardly opening dispensing nozzle for continuously dispensing a plastic material, transfer means operable to advance empty containers in step fashion along a path crosswise of the nozzle to a filling station below said nozzle and for advancing filled containers away from the filling station, means at the filling station for elevating a container into position around the nozzle, means operative when the container is filled for operating the transfer means to move the filled container crosswise of the nozzle, the improvement comprising a pusher positioned to engage the trailing side of the container at a level adjacent the lower end of the nozzle, and means operative when said transfer means is operated for moving the pusher only part way across the nozzle to aid in shearing the material in the container from the material in the nozzle and for retracting said pusher before said transfer means moves the container completely across the nozzle.

12. In an apparatus for filling containers including a downwardly opening dispensing nozzle for continuously dispensing a plastic material, laterally spaced transfer means extending crosswise of the nozzle and having longitudinally spaced container engaging fingers thereon, means for reciprocating said transfer means to advance empty containers in step fashion to a filling station below the nozzle and to move filled containers away from the nozzle, means operative when the container is filled for moving the transfer means to advance a filled container crosswise of the nozzle, a pusher extending crosswise between the transfer means adjacent the lower end of the nozzle to engage the trailing side of a container, and means for moving said pusher only part way across the nozzle when the transfer means is operated to aid in shearing the material in the container from the material in the nozzle and for retracting said pusher before said transfer means moves the container completely across the nozzle.

13. In an apparatus for filling containers including a frame structure, a downwardly opening dispensing nozzle mounted on the frame structure for continuously dispensing a plastic material, conveyor means on the frame structure for supporting and advancing empty containers to a filling station below the nozzle with the upper ends of the container spaced below the nozzle to provide clearance between the container top and the material emerging from the nozzle, an elevator on the frame structure at the filling station movable between an initial position spaced below the nozzle a distance sufficiently greater than the height of a container to allow an empty container to move onto the elevator and a raised position elevating a container into position around the nozzle, said conveyor means including means for moving a filled container away from the filling station, means operative when the container is filled and moves down to a position with the top of the container adjacent the lower end of said nozzle for operating said conveyor means to move a filled carton

away from the nozzle, a pusher positioned above the level of the tops of the containers as they are advanced to the filling station and below the lower end of the nozzle to engage the trailing side of a filled container at a level adjacent said nozzle, and means operatively connected to said conveyor means for moving said pusher with said conveyor means in a direction crosswise of the nozzle to aid in shearing the material in the container from the material in the nozzle.

14. In an apparatus for filling containers including a frame structure, a downwardly opening dispensing nozzle mounted on the frame structure for continuously dispensing a plastic material, conveyor means on the frame structure for supporting and advancing empty containers to a filling station below the nozzle with the upper ends of the container spaced below the nozzle to provide clearance between the container top and the material emerging from the nozzle, an elevator on the frame structure at the filling station movable between an initial position spaced below the nozzle a distance sufficiently greater than the height of a container to allow an empty container to move onto the elevator and a raised position elevating a container into position around the nozzle, said conveyor means including means for moving a filled container away from the filling station, means operative when the container is filled and moves down to a position with the top of the container adjacent the lower end of said nozzle for operating said conveyor means to move a filled carton away from the nozzle, a pusher positioned above the level of the tops of the containers as they are advanced to the filling station and below the lower end of the nozzle to engage the trailing side of a filled container at a level adjacent said nozzle, a pusher support member supporting the pusher on the frame structure for reciprocation in a direction crosswise of the nozzle, a means yieldably urging the pusher to a retracted position, a finger on said conveyor means engageable with said pusher support member to extend the same during movement of the conveyor means, and means for disengaging said pusher support member from said finger after the pusher has moved part way across the nozzle.

15. In an apparatus for filling containers including a frame, a downwardly opening dispensing nozzle mounted on the frame, spaced lateral container guide means mounted on the frame and extending crosswise of the nozzle for laterally guiding the containers along a path below the nozzle, transfer means for advancing empty containers along the lateral container guide means to a filling station below the nozzle and for moving filled containers away from the filling station, said guide and transfer means supporting the empty containers as they are advanced to the filling station with their upper edges spaced below the lower end of the nozzle to provide clearance between the top of the container and the material emerging from the nozzle, elevating means at the filling station movable between an initial position spaced below the nozzle a distance greater than the height of a container and a raised position elevating a container into position around the nozzle, container support means having a generally horizontal container supporting surface, means mounting said support means on the frame for movement laterally of said guide means into and out of a container support position therebetween with said container supporting surface spaced below the lower end of the nozzle a distance approximately equal to the height of a container, said container support means having means engageable with an empty container as it is advanced by the transfer means to the filling station for moving the support means laterally out of its support position between the guide means, said container support means being yieldably urged to its container support position to underlie the container when the container is elevated whereby the support means engages and supports the underside of the container when it thereafter moves downwardly to a position with its top adjacent the lower end of the nozzle to support the filled container as it is advanced by the transfer means crosswise of the nozzle, a pusher positioned at a level above the tops of the containers as they are advanced to the filling station and below the lower end of the nozzle to engage the trailing side of a filled carton at a level adjacent said nozzle, and means for moving said pusher part way across the nozzle when the transfer means is operated to move a filled container away from the nozzle.

16. The combination of claim 15 including means for retarding downward movement of said elevator, and means operative when the filled container is moved away from the filling station for releasing said retarding means to allow the elevator to move down to its initial position.

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LAVERNE D. GEIGER, *Primary Examiner.*