Dec. 27, 1966 A. D. FARNOW 3,293,827

PACKAGE END FLAP FOLDING AND SEALING MACHINE

Filed July 3, 1963 11 Sheets-Sheet 1

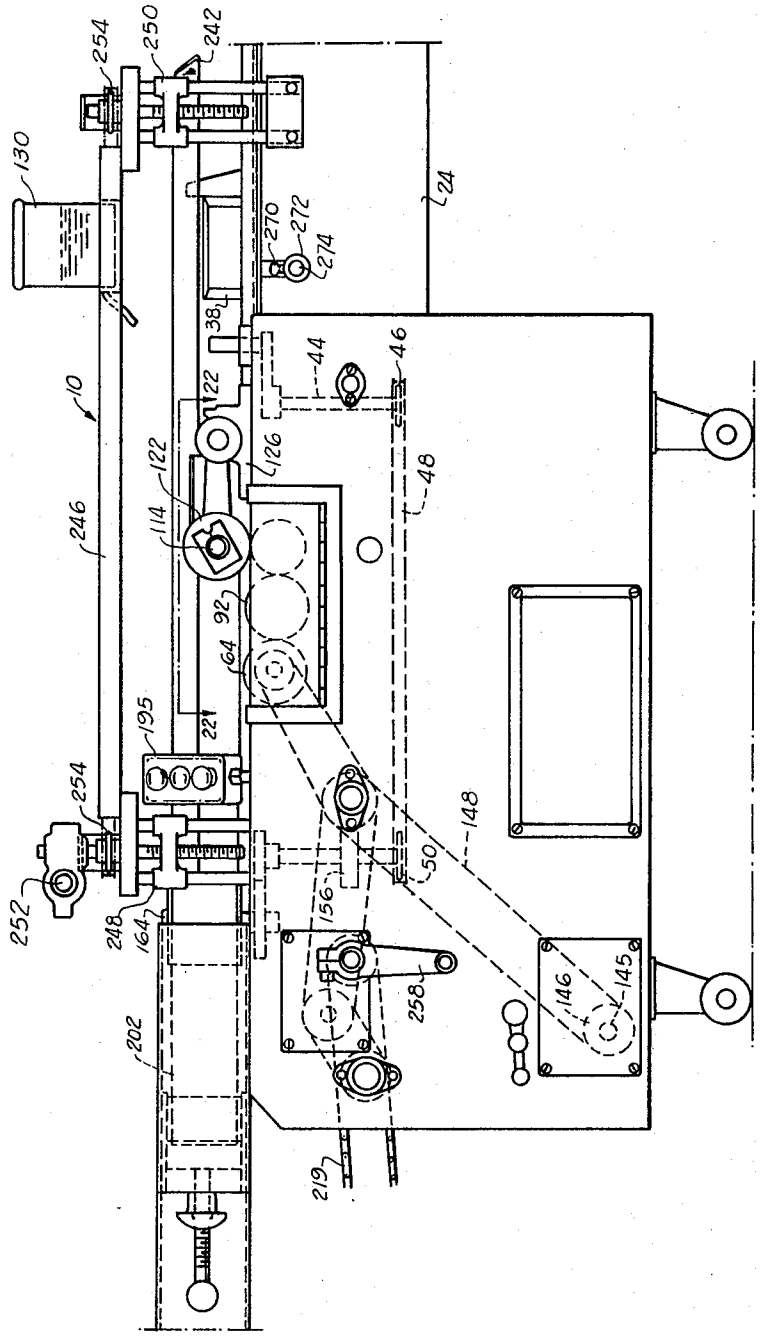


FIG. 1

INVENTOR
ARTHUR D. FARNOW

Dec. 27, 1966 A. D. FARNOW 3,293,827

PACKAGE END FLAP FOLDING AND SEALING MACHINE

Filed July 3, 1963 11 Sheets-Sheet 2

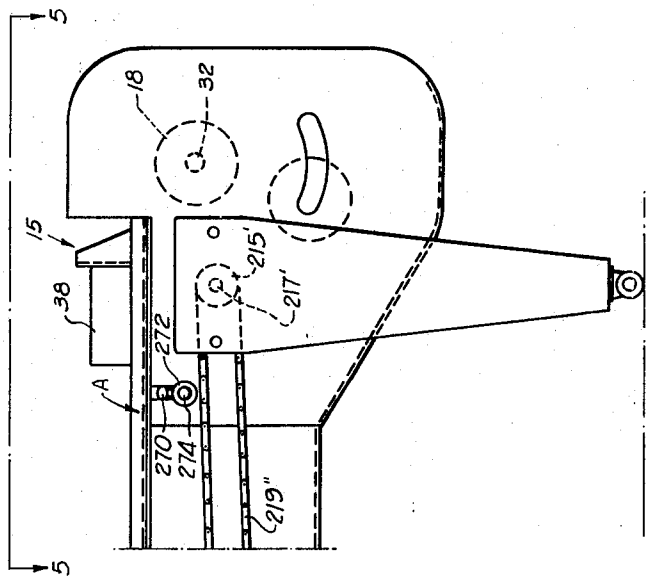


FIG. 2

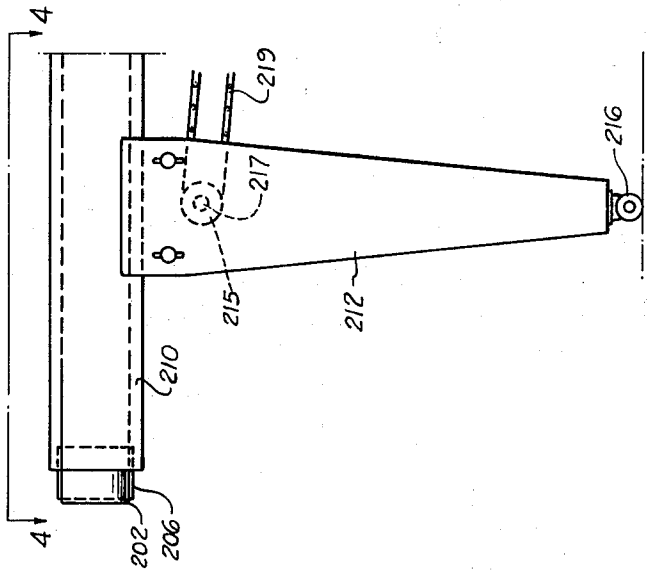


FIG. 3

INVENTOR
ARTHUR D. FARNOW

Dec. 27, 1966 A. D. FARNOW 3,293,827

PACKAGE END FLAP FOLDING AND SEALING MACHINE

Filed July 3, 1963 11 Sheets-Sheet 3

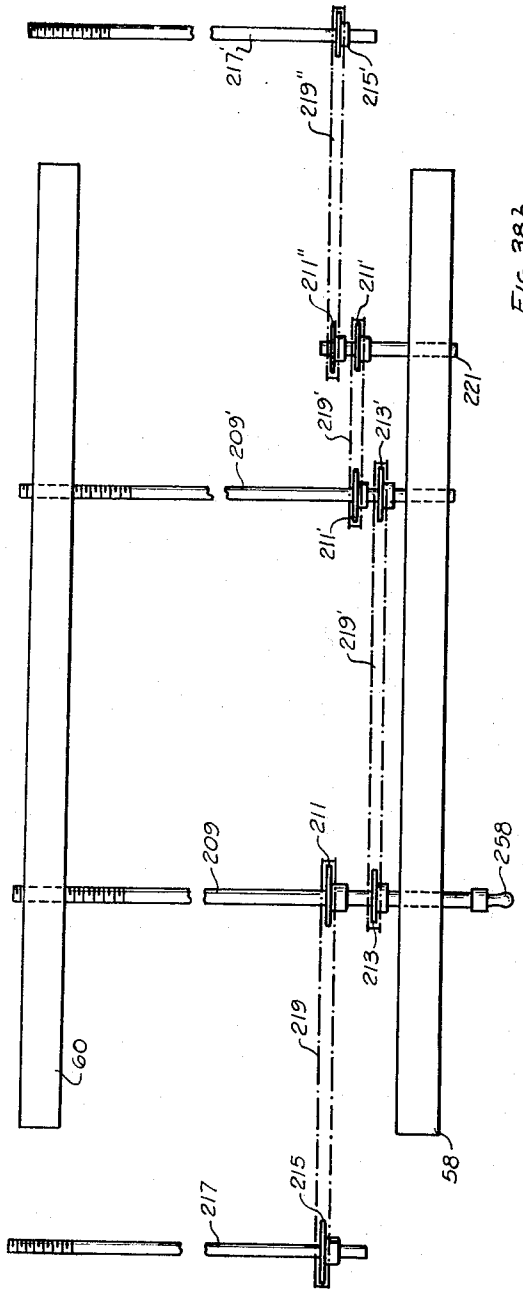


Fig. 3B

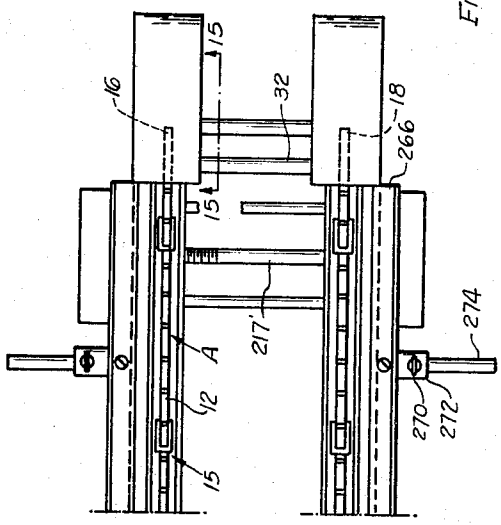


Fig. 5

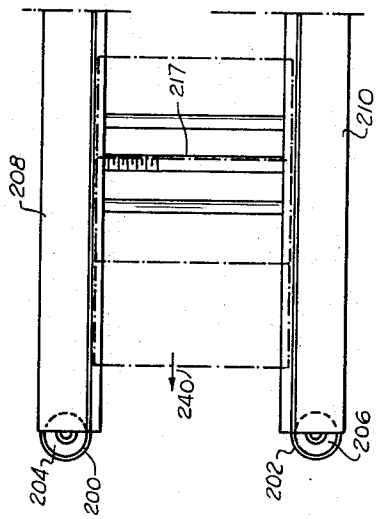


Fig. 4

INVENTOR
ARTHUR D. FARNOW

Dec. 27, 1966 A. D. FARNOW 3,293,827

PACKAGE END FLAP FOLDING AND SEALING MACHINE

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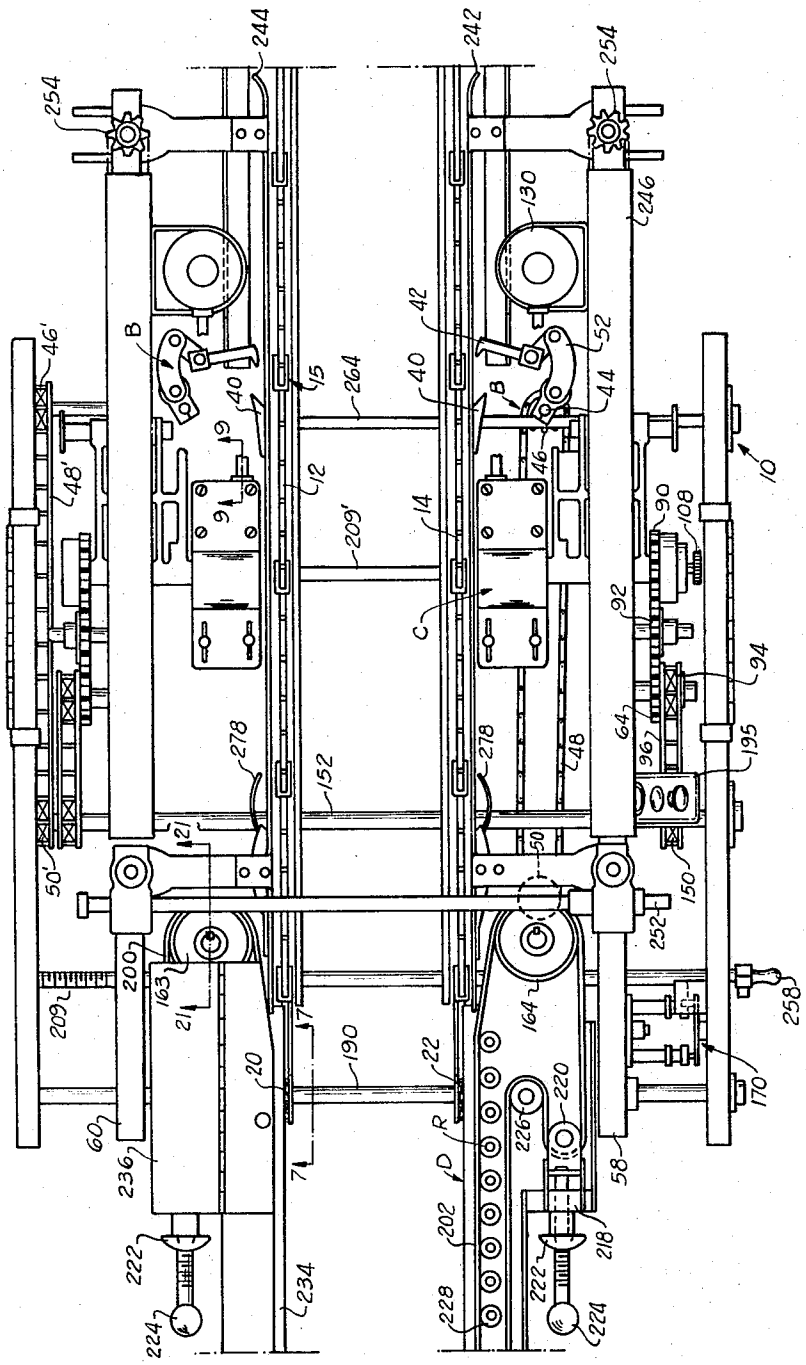


Fig. 6

INVENTOR
ARTHUR D. FARNOW

PACKAGE END FLAP FOLDING AND SEALING MACHINE

Filed July 3, 1963 11 Sheets-Sheet 5

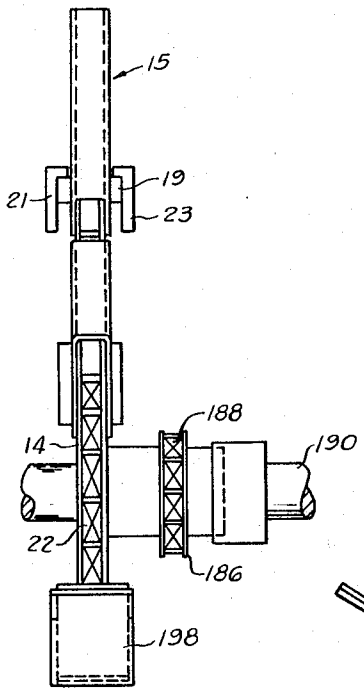


FIG. 8

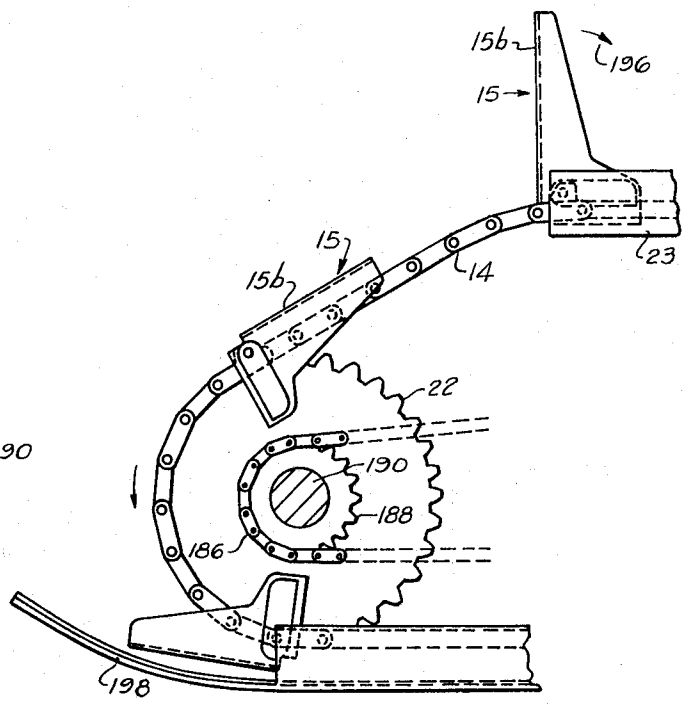


FIG. 7

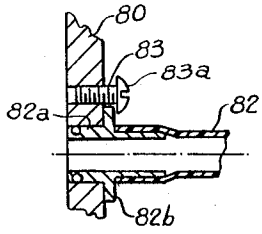


FIG. 9

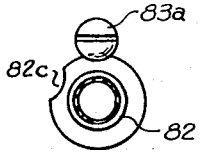


FIG. 10

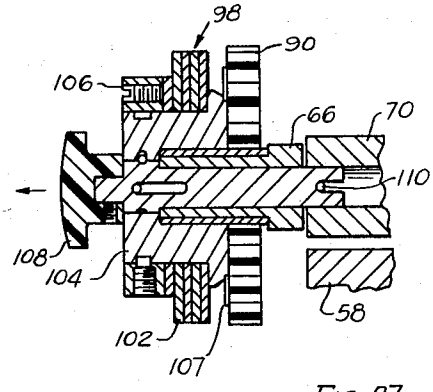


FIG. 27

INVENTOR.
ARTHUR D. FARNOW

BY
MOSES, McGLEW & TOREN

Dec. 27, 1966 A. D. FARNOW 3,293,827

PACKAGE END FLAP FOLDING AND SEALING MACHINE

Filed July 3, 1963 11 Sheets-Sheet 6

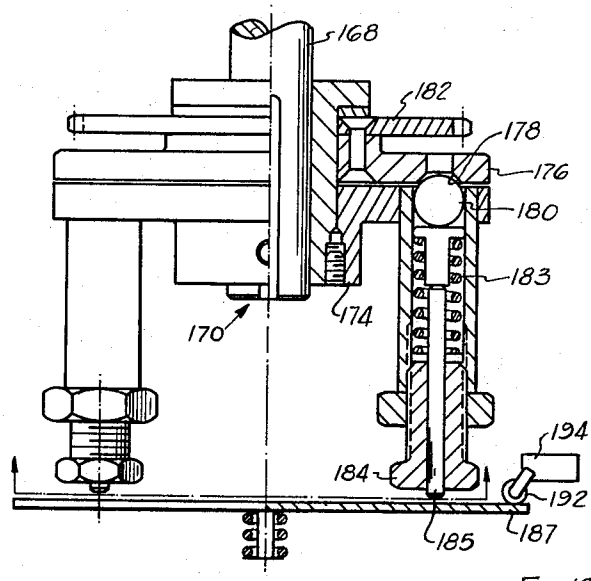


FIG. 12

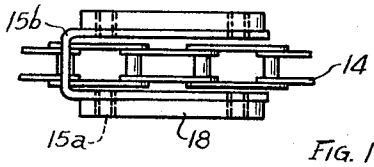


FIG. 14

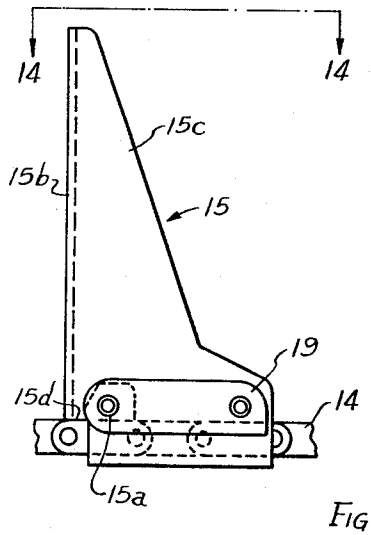


FIG. 13

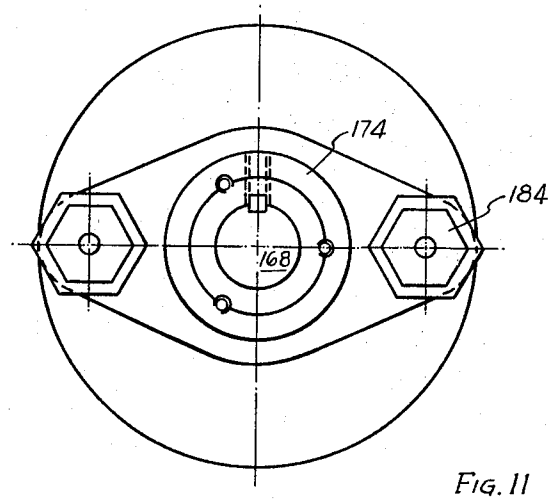


FIG. 11

INVENTOR.
ARTHUR D. FARNOW

BY
MOSES, McGLEW & TOREN

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PACKAGE END FLAP FOLDING AND SEALING MACHINE

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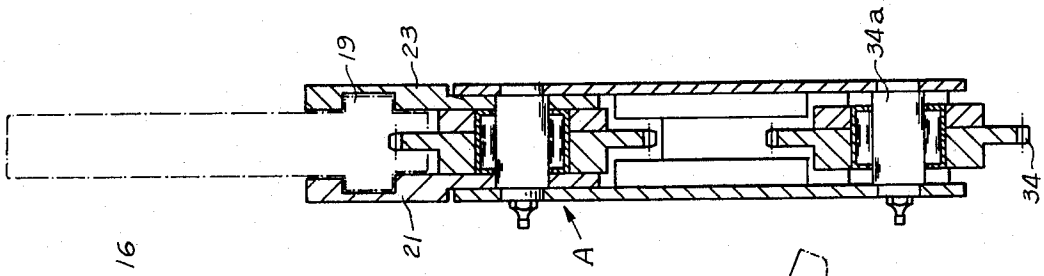


FIG. 16

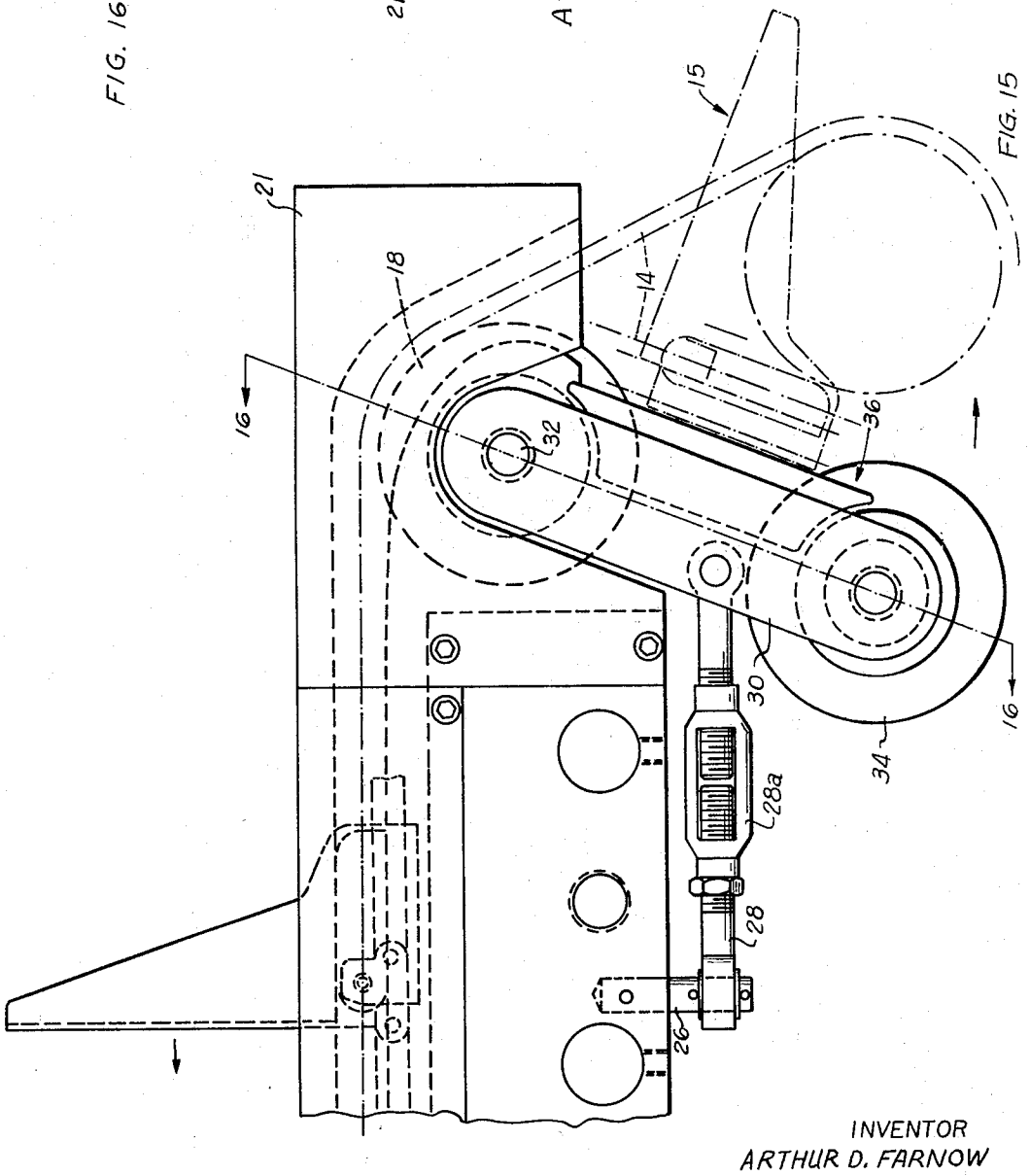


FIG. 15

INVENTOR
ARTHUR D. FARNOW

Dec. 27, 1966 A. D. FARNOW 3,293,827

PACKAGE END FLAP FOLDING AND SEALING MACHINE

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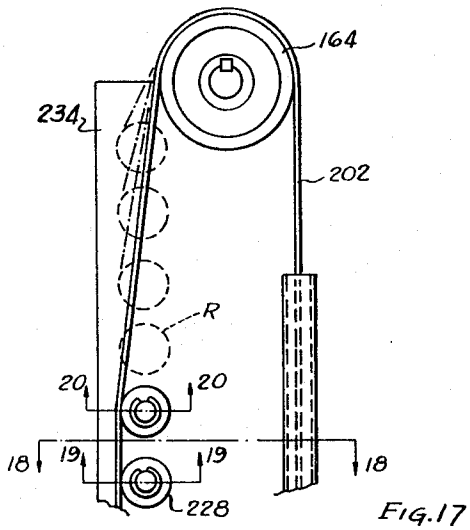


FIG. 17

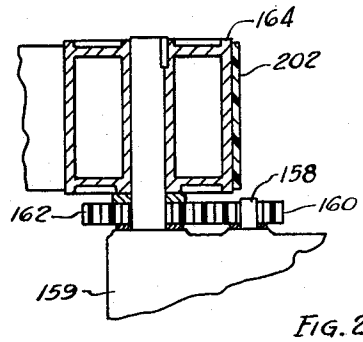


FIG. 21

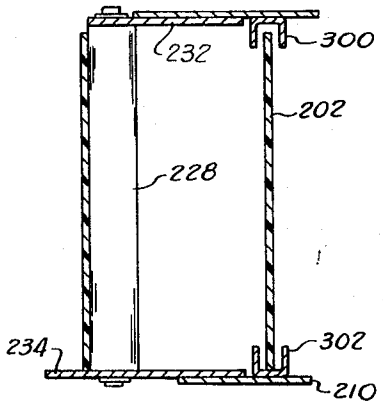


FIG. 18

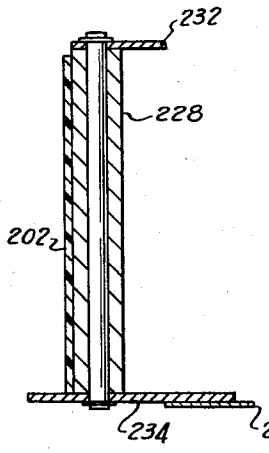


FIG. 19

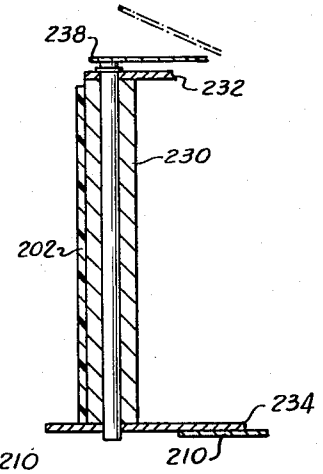


FIG. 20

INVENTOR.
ARTHUR D. FARNOW
BY
MOSES, Mc GLEW & TOREN

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PACKAGE END FLAP FOLDING AND SEALING MACHINE

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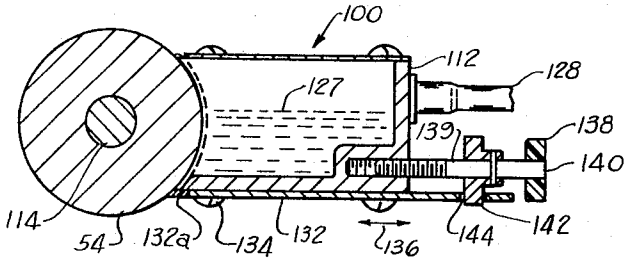


FIG. 26

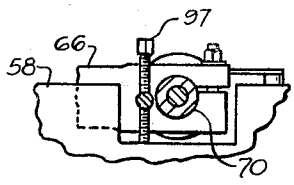


FIG. 25a

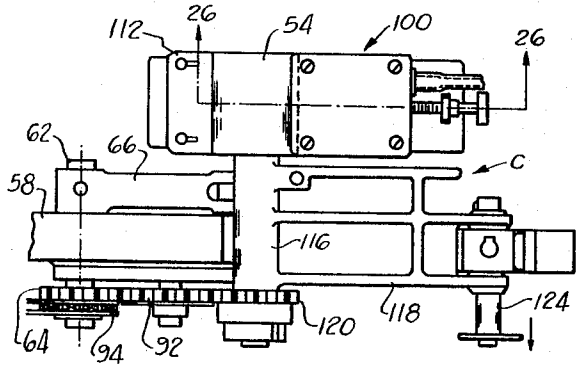


FIG. 22

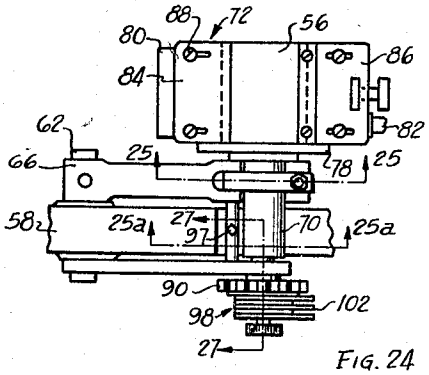


FIG. 24

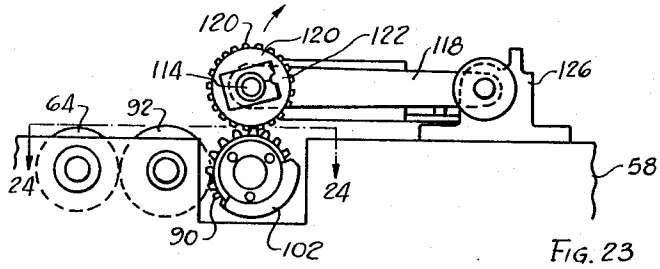


FIG. 23

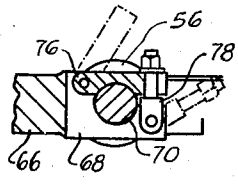


FIG. 25

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PACKAGE END FLAP FOLDING AND SEALING MACHINE

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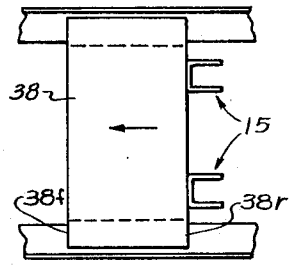


FIG 28

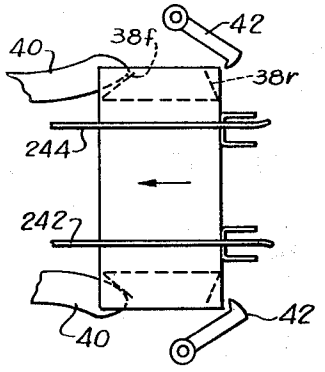


FIG. 29

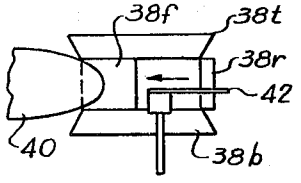


FIG. 30

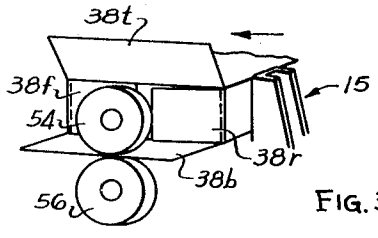


FIG. 31

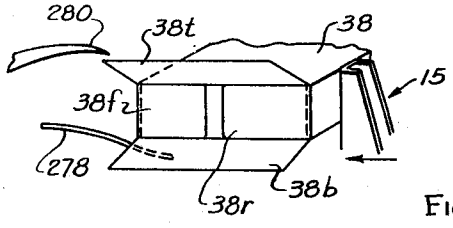


FIG. 32

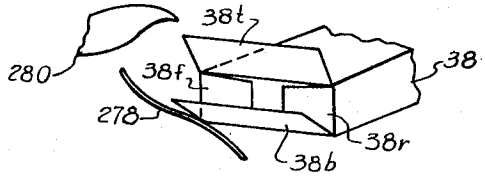


FIG. 33

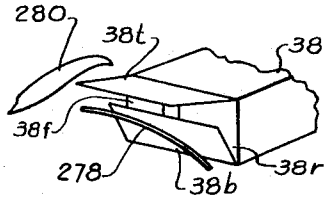


FIG. 34

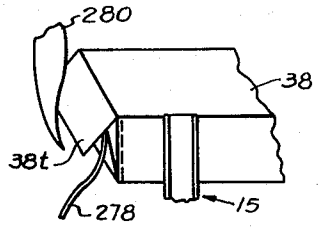


FIG. 35

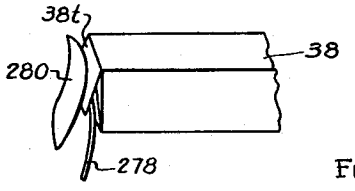


FIG. 36

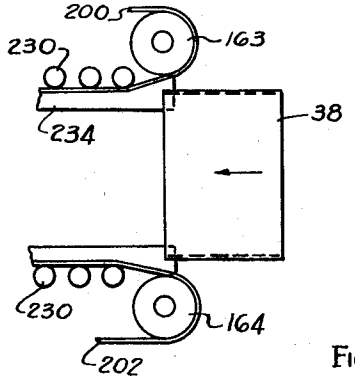


FIG 37

INVENTOR.
ARTHUR D. FARNOW

BY
MOSES, McGLEW & TOREN

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PACKAGE END FLAP FOLDING AND SEALING MACHINE

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FIG. 38

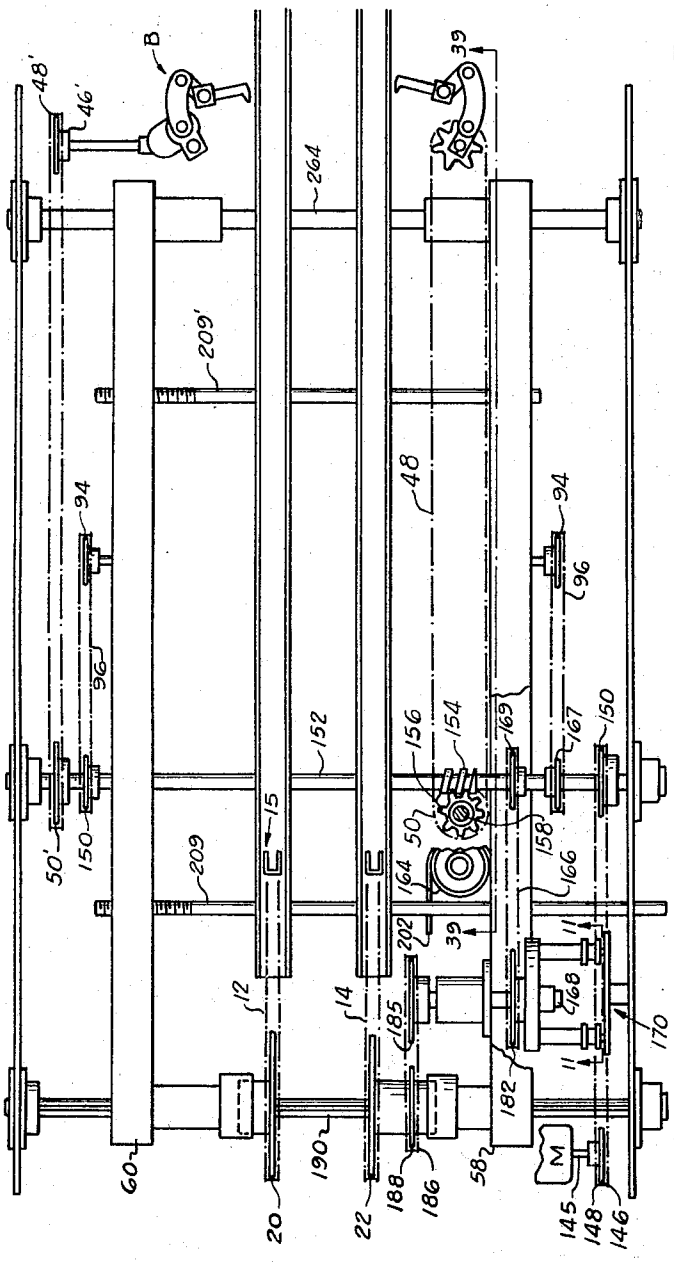
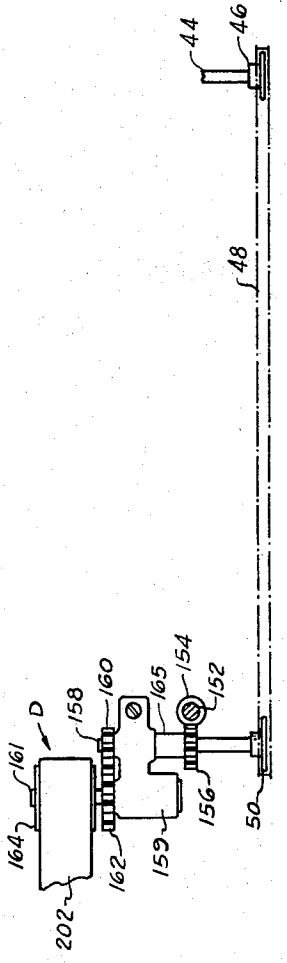


FIG. 39



INVENTOR
ARTHUR D. FARNOW

United States Patent Office 3,293,827
Patented Dec. 27, 1966

3,293,827

PACKAGE END FLAP FOLDING AND SEALING MACHINE

Arthur D. Farnow, Verona, N.J., assignor to Superior Packaging Equipment Corp., Carlstadt, N.J.

Filed July 3, 1963, Ser. No. 292,574
22 Claims. (Cl. 53—374)

This invention relates in general to package sealing machines, and in particular to a new and useful machine for folding the end flaps of a container, applying glue to one of more of the flaps, and transferring the folded and glued flaps into a compression conveyor for drying the closed flaps in sealed relationship.

Flap folding and sealing machines have several disadvantages in their construction and operation, which are obviated by the present device. With machines of this type it is usual to advance containers into association with folding and tucking elements for closing an end of the container and for orienting the flaps for the purpose of applying glue thereto.

Chain conveyors which are employed for such operations include pusher elements carried by spaced parallel chains. The pushers are aligned behind the container in order to advance it evenly into association with the folding and gluing mechanism. With prior art devices, in some instances one of the pusher members of one of the chains would become jammed which, in some instances, would result in the forward feeding of the other of the pusher members in advance of the one which was jammed so that the containers would become misaligned or even crushed. A further disadvantage in the operation of devices of this nature is that pusher elements were mounted for pivotal movement so that they could swing around an arc of a sprocket wheel which was employed for driving the chain. Under such swinging movement the pusher element often became damaged and worn in a short period of operating time and, in addition, since they were not guided during swinging movement at the exit end, the tops of the members would often interfere with the feed line for the containers as they were coming up into position, swinging around the arc of the associated sprocket member.

A further disadvantage of machines of this character is that the operating mechanism is often complicated with the result that the machinery is cluttered and there is little access to the operating parts. In addition, it is difficult to provide for adjustment for accommodating containers of various sizes. When machines of this character include means for automatically gluing the flaps of the container as it is advanced, each driving mechanism of the gluing device is formed integrally with the machinery and must be completely disassembled in order to permit a change in the gluing mechanism or its operation. In addition, devices of this nature do not permit easy change in the operation of the gluing mechanism, such as for applying glue at spot locations, for applying it to one or more flap elements, etc.

With the container sealing machines known at the present time, it is usual to advance the container after the flaps have been glued and folded into sealed relationship into a conveyor for the purpose of compressing the ends of the container until the glue is dried. With conveyors of this sort, it was possible to adjust the spacing between two wide conveyor belts employed for such compression only by changing the spacing between the frame or by shifting sets of rollers which were arranged to abut against the compressing side of the belt conveyor. A difficulty in such an arrangement is that it was difficult to obtain accurate alignment along the complete length of the compressor conveyor and, in addition, it was difficult, if not impossible, to provide for a gradual compressive infeed of the containers to a position at which the compressive force becomes greater and then uniform throughout the length of the conveyor system. A further difficulty is that the tension on the conveyor belt was not easily adjustable without shifting the centers of the pulleys over which the belts were trained to run and changing the length of the conveyor.

In accordance with the present invention, there is provided a machine for sealing the end flaps of containers which overcomes the disadvantages of the prior art machines in the respects enumerated above. In accordance with one embodiment of the invention, there is provided spaced parallel chain elements each of which has a plurality of pusher members, respective ones of which are aligned laterally. The chain conveyor is driven through a clutch member comprising a rounded element such as a ball element carried by a driving member which is biased into a recess of a driven member by the force of a spring. The spring tension is set so that any jamming of the conveyor by obstruction of the pusher members will cause the ball to ride out of a driving engagement in the recess and no destruction of the packages being fed will ensue.

A further feature of this arrangement is that the movement of the fallout of recess causes the shut off of the driving motor. Returning of the drive is automatic once the ball is again seated in the recess so that no misalignment of the chains may result.

In accordance with a further feature of the invention, the pusher elements are carried by a pivotal connection to the chain conveyor at their forward ends and are provided with a cam-like slide surface of durable material which is trained to run on a slideway. The slideway is advantageously formed as a block carried for pivotal movement about the main sprocket wheel of the conveyor so that the slideway may be positioned to effect sloping-up feed of the pusher member and then complete smooth guidance thereof into the line of package feed at the forward end of the machine. To facilitate this construction and to provide means for tensioning the chain conveyor at the entrance of the machine, there is provided a link member which is pivoted on the entrance sprocket and which carries at its outer end a guiding sprocket which may be swung outwardly or inwardly in relation to the main sprocket under the control of a turnbuckle for the purpose of adjusting the tension on the sprocket chain and also for the purpose of aligning the slideway for the pusher member.

In accordance with a further feature of the invention, the machine advantageously includes two rigid frame members connected together by a pair of screw members which are sprocket-and-chain driven and permit equal lateral adjustment of the frame members in relation to each other. The frame members are recessed in a central portion to accommodate a novel gluing mechanism which may be easily inserted into or removed from the frame, permitting easy adjustment of the machine from a gluing machine to merely a folding or flap locking machine, if desired.

A feature of the gluing mechanism construction is that the lower gluing roller is carried on an arm which is pivotally mounted in the frame and which has an open bearing support at its one end for receiving a lower glue mechanism assembly which advantageously comprises a reservoir in which is rotatable a glue roller mounted on a shaft which extends outwardly from the glue roller and carries a gear thereon for simple connection to the driving gears of the machine. The shaft advantageously also includes an adjustable rotatable cam member positioned to permit easy engagement by a follower element of an upper glue mechanism assembly.

The upper glue mechanism assembly is advantageously

carried on another arm which is pivoted on the frame and extends in a direction opposite from the first arm to facilitate positioning of an upper glue mechanism at the end of the arm with the driving gear of its shaft in engagement with the driving gear of the lower glue mechanism assembly. The upper glue mechanism shaft carries a roller which may be easily positioned in operating spaced orientation with the underlying glue roller of the lower glue mechanism assembly. The complete gluing mechanism is novel inasmuch as it may be simply mounted in the frame, with the upper glue mechanism arranged to cooperate easily with the lower glue mechanism and with a follower disc of the upper mechanism arranged to cooperate with the cam elements carried on the shaft of the lower mechanism. In this manner, the feed or rotational speed of the glue cylinders may be easily changed such as by changing their driving gearing and the operation thereof may also be changed such as by changing the position of the cam for causing the up and down movement of the upper assembly with the pivotal arm such as where spot gluing is desired. Because the arms which support the glue mechanism assemblies include a lower open bearing shell with a pivotal and releasable upper bearing cover, the glue mechanism assemblies may be easily removed and/or repositioned in the machine. The arm which supports the upper glue mechanism assembly has simple adjustable stop means to permit it to be raised out of an operative position whenever it is desired to discontinue its gluing operation, and the lower roller operating position may be raised for gluing an upper flap on the container, for example. Each of the upper and lower glue mechanisms includes as a removable piece the frame including the glue reservoir, a shaft sleeve and the glue roller held by the reservoir with its shaft rotatably supported therein.

Each of the glue mechanism assemblies includes a separates reservoir with an adjustable doctor plate or blade thereon which may be simply manipulated for varying the amount of glue which is discharged during rotation of the glue roller.

A further feature of the invention is the provision of a novel drying conveyor which includes large diameter pulleys carried on each end of the compressor conveyor section and on each frame member with belts trained to run around a set of pulleys of each frame so that the flat portions of the belts are disposed vertically and in opposition to each other along a central active compression section. A feature of the construction is that the conveyor belt may be easily tensioned under a novel arrangement which includes separate guide pulleys, one of which is carried on a movable block on the side of the conveyor opposite to the active section. The roller may be displaced for the purpose of regulating the tension of the belt without changing the length of the active section. The arrangement on the machine is in a novel manner inasmuch as the adjustment mechanism is very accessible and an adjustable of the belt tension may be simply made.

In accordance with a further feature of the invention, the compressive conveyor includes an infeed spacing control box which includes a pivotal cover which may be raised for the purpose of installing or removing one or more roller elements at a location adjacent each infeed pulley. After the spacing of the frames is set so that the spacing between the vertical edges of the pulley belts corresponds to the approximate size of the container to be fed, it is possible to make a further accurate adjustment of the positioning of the belt, particularly at the location of the infeeding of the container. This is done by removing or inserting roller elements which are located along the line of the conveyor belts but spaced outwardly (i.e., toward the opposite pulley belt) from the periphery of the incoming pulleys. Thus, installation or removal of the rollers will vary the inward train or taper of the belt from the relatively smaller diameter pulleys to the rollers which are spaced inwardly from the periphery thereof.

The machine also includes numerous other novel features and arrangements, such as simple means for guiding

the compressor conveyor belts and means for adjusting the guide rails for supporting the boxes or containers as they are being fed for the tucking and sealing operation.

Accordingly, it is an object of this invention to provide an improved container sealing machine.

A further object of the invention is to provide a conveyor for advancing containers and the like, comprising a pair of spaced chain elements, each having a plurality of pusher elements carried thereon, said chains being arranged in parallel relationship with the pusher elements aligned laterally and including driving clutch means for driving said chains for effecting disengagement of the drive to the chains when there is an overload on one or more of the pushers.

A further object of the invention is to provide a gluing mechanism for use in a package sealing machine and the like which includes a pivotal arm including a glue mechanism assembly, the assembly including a shaft adapted to be supported on the arm and carrying a rotating glue cylinder at one end which rotates within a reservoir supported around the shaft and which carries gear means at the opposite end for easy connection of the operating mechanism to the machine.

A further object of the invention is to provide a glue mechanism assembly including a frame supporting a shaft with a roller at one end and means at the opposite end for connecting the roller for driving rotation, with adjustable doctor means carried in a reservoir container portion including a plate element which is slidable for the purpose of adjusting the spacing between said roller and the reservoir.

A further object of the invention is to provide an improved gluing mechanism for package sealing machines which includes first and second pivotal arms for supporting upper and lower glue mechanism assemblies, the arms extending in opposite directions and supporting the shafts for the respective upper and lower assemblies in substantially parallel relationship, the shafts of one assembly including gear means which engage gear means on the other assembly.

A further object of the invention is to provide an improved glue mechanism which includes a glue reservoir arranged to be supported around and to encompass a major portion of a glue roller, which glue roller includes a portion which extends through an opening of the reservoir, one side of which is closed by an adjustable doctor plate member.

A further object of the invention is to provide a packaging machine which comprises two major frame elements arranged in parallel relationship, each carrying means for driving a chain and sprocket feed conveyor at one end and a belt compression conveyor at the opposite end with means for adjusting the spacing between the frame elements in a parallel manner without disturbing the driving mechanism.

A further object of the invention is to provide a novel compressor conveyor mechanism which includes endless belts trained to run around longitudinally spaced infeed and discharge pulley members with the belt of one set disposed vertically and parallel to and spaced from the belt of the opposite set, and including roller members between the pulleys of each set guiding the belts intermediate of the pulleys, some of the roller members being removable, the infeed pulleys being oriented so that depending on the rollers present adjacent the infeed pulley, the infeed taper of the two conveyors may be varied.

A further object of the invention is to provide an improved belt conveyor which includes a pair of main pulleys spaced longitudinally, an endless belt trained to run around said main pulleys, a stationary guide pulley exterior of said belt, and a movable pulley, movable from the interior of said belt outwardly for tensioning the belt between one of said main pulleys and said guide pulley.

A further object of the invention is to provide a ma-

chine for folding, gluing and pressure sealing a container, package or the like, which is of simple design with exposed parts accessible for replacement and overhaul and which is of rugged construction and is economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated and described a preferred embodiment of the invention.

In the drawings:

FIG. 1 is a side elevation of the central portion of a package sealing machine constructed in accordance with the invention;

FIGS. 2 and 3 are side elevations of the left end portion and right end portion of the machine indicated in FIG. 1;

FIGS. 4, 5 and 6 are top plan views of the machine indicating the left-hand portion, the right-hand portion and the central portion, respectively;

FIG. 7 is a section taken on the line **7—7** of FIG. 6;

FIG. 8 is an end elevation of a portion of the machine indicated in FIG. 7;

FIG. 9 is a fragmentary sectional view of the glue reservoir connector taken along the line **9—9** of FIG. 6;

FIG. 10 is a front elevational view of the reservoir connector indicated in FIG. 9;

FIG. 11 is a side elevational view of the clutch mechanism;

FIG. 12 is a partial transverse section and partial end elevation of the clutch of FIG. 11;

FIG. 13 is a partial fragmentary side elevation of the sprocket chain with the pusher elements thereon;

FIG. 14 is a bottom view of the sprocket chain and pusher elements of FIG. 13;

FIG. 15 is a section taken on the line **15—15** of FIG. 5;

FIG. 16 is a section taken on the line **16—16** of FIG. 15;

FIG. 17 is a section taken on the line **17—17** of FIG. 3;

FIG. 18 is a section taken on the line **18—18** of FIG. 17;

FIG. 19 is a section taken on the line **19—19** of FIG. 17;

FIG. 20 is a section taken on the line **20—20** of FIG. 6;

FIG. 21 is a section taken on the line **21—21** of FIG. 6;

FIG. 22 is a fragmentary top plan view of the upper and lower glue mechanisms taken along the line **22—22** of FIG. 1;

FIG. 23 is a partial side elevation of the glue mechanism indicated in FIG. 22;

FIG. 24 is a top plan view of the lower glue mechanism assembly taken along the line **24—24** of FIG. 23;

FIG. 25 is a section taken on the line **25—25** of FIG. 24;

FIG. 25*a* is a section taken on the line **25*a*—25*a*** of FIG. 24;

FIG. 26 is a section taken along the line **26—26** of FIG. 22;

FIG. 27 is a section taken along the line **27—27** of FIG. 24;

FIGS. 28 to 37 are schematic views indicating the operation of the machine to hold the flaps, glue the flaps, and thereafter compress them together;

FIG. 38 is a top view of a schematic indication of the chain drive for the machine;

FIG. 38*b* is a schematic top view of the frame lateral adjustment mechanism; and

FIG. 39 is a schematic side elevation of the chain drive.

Referring to the drawings in particular, the invention embodied therein comprises a complete package flap folding, gluing and pressure sealing machine generally designated **10** (FIGS. 1 to 6 inclusive). The machine **10** includes a chain conveyor generally designated A which is arranged to move containers which are either manually or automatically fed at an entrance or infeed end of the machine indicated particularly in FIGS. 2 and 5, to and along the central portions indicated particularly in FIGS. 1 and 6. When the container is advanced along the central portion, a tucker mechanism generally designated B in conjunction with folding cams is arranged to fold the side flaps and then to orient the top and bottom flaps so that they may be glued by movement into association with the glue mechanism generally designated C. The folding is completed by additional plow or folding elements and the glued and folded flaps are held in sealed relationship and transferred by the chain conveyor A for feeding between an endless belt pressure conveyor generally designated D.

In accordance with one feature of the invention the endless chain conveyor A, as best indicated in FIGS. 5, 6, 7, 8, 15 and 16, includes spaced parallel endless chains **12** and **14** trained to run around entrance or infeed sprockets **16** and **18**, respectively, at one end and delivery sprockets **20** and **22** at the delivery end. Outer sprockets **18** and **20** are held on to their respective shafts in a manner permitting movement along the shafts for movement laterally with their associated outer supporting frame **60**. Each chain **12** and **14** carries a plurality of pusher elements generally designated **15** which are carried on a pivot member portion **15*a*** (FIG. 14) which extends through a chain link. The pusher member **15** includes a forward substantially straight front portion **15*b*** and an oblique trailing portion **15*c***. Each side carries a replaceable hardened guide block **19** which permits alignment of the pusher member in channel-shaped side plates or guide cams **21** and **23** of the conveyor A (see FIG. 16).

The machine **10** includes a frame extension **24** which carries a pin **26** for supporting one end of a turnbuckle **28** (FIG. 15). The opposite end of the turnbuckle **28** is pivotally connected to a lever or arm **30** which is rotatably mounted on a shaft **32** carrying the sprockets **16** and **18**. The central portion **28*a*** of the turnbuckle may be rotated to shift the lever **30** and hence shift the position of an idler sprocket **34** which is rotatable in the opposite end of the lever **30**. The chains **12** and **14** of each side of the conveyor are trained to run around respective idler sprockets **34, 34**. The arrangement of the pivotal lever **30** is such that by mere adjustment of the turnbuckle **28** it is possible to swing the sprocket **34** from the solid line position to the dotted line position indicated in FIG. 15. In doing so, the tension on the associated sprocket chain **12** or **14** is changed. This permits easy adjustment of the chains and also replacement without complete disassembly of the machine.

A further feature of the construction is that the pusher **15** is pulled by the sprocket chains **12** or **14** upwardly over a slide block member generally designated **36** which is carried on the lever **30**. In accordance with the disposition of the lever, therefore, the slide block **36** may be adjusted to provide an even glide surface for the upward movement of the pusher **15** around sprocket **18** for entrance between guide plates **21** and **23**. The upward entrance movement of the pusher **15**, as indicated particularly in FIG. 15, is such that the pusher will be guided easily and without swinging around the associated entrance sprocket **16** or **18**. In this way there is less danger that the pusher will wear due to its being shifted on its pivotal connection with the chain as it is moved around the entrance sprocket **16** or **18**.

Containers, such as container **38** (FIGS. 1 and 6) are fed to the conveyor A such as by a downward automatic feed (not shown) or by an operator who places the containers on the conveyor A one at a time ahead of

each pair of pushers 15. The containers 38 are advanced by the pushers 15 first into association with folding plows or bars 40, 40, one arranged on each side of the chain conveyor A. The bars 40, 40 cause the inward deflection of the forward end flap. A tucker finger 42 of the tucker mechanism B is oscillated in timed relation to cause the in tucking of the flap at the opposite trailing end of the container 38 (see FIGS. 28 and 29).

The tucking mechanism B is of conventional design and includes a shaft 44 carried on a sprocket 46 which is rotated through a chain 48 which, in turn, is driven by a sprocket 50 (FIGS. 6, 38, and 39). The shaft is rotated to oscillate the tucker finger 42 through an intermediate linkage 52. One feature of the arrangement is that the tucker B on the far side of the machine is indicated as being operated by means of a vertically arranged sprocket 46′ driven from a vertically arranged chain 48′ and a vertically arranged sprocket wheel 50′. In this instance, suitable angle gearing (not shown) is interposed between the sprocket 46′ and the tucker shaft 44. Either the horizontal tucker drive or a vertical drive may thus be easily effected with a machine of this invention. The two separate drives are shown to merely show the adaptability of the machine.

As indicated in FIG. 30, after the end flaps 38F and 38R are pressed in, the top and bottom flaps 38T and 38B are maintained separated by the bars 40 until the top or the bottom flap, whichever is to be glued, is moved into a plane aligned with the nip between an upper glue roller 54 and a lower glue roller 56 of the glue mechanism generally designated C (FIGS. 31, 22 and 24).

In accordance with another feature of the invention, the glue mechanism generally designated C is carried in respective solid block frame members 58 and 60 on respective sides of the machine (FIGS. 1 and 6). The frame block 58, as indicated in FIG. 22, is drilled to provide a bearing for a shaft 62 which freely supports on its one gear 64 and also rigidly carries arm 66 on this end. At the inner end of the shaft 62 there is a lever arm member 66 which has an open bearing 68 for receiving a shaft sleeve 70 for a shaft 17 of the lower glue mechanism assembly generally designated 72. In the lowermost position of the lever arm 66, as indicated in FIG. 24, the shaft member 70 rests on the frame 58 which is recessed for this reason. The shaft 70, along with the whole glue mechanism assembly 72, may be removed from the open bearing support by removing a bearing cover portion 76 which is pivoted to the arm 66. The cover portion 76 may be pivoted about pin 77 after a pivotal bolt member 78 is shifted from the solid line position to the dotted line position indicated in FIG. 25.

As indicated in FIG. 27, knob 108 is pulled out to disengage pin 110 and release shaft 70 and the glue mechanism 72. The lower glue mechanism assembly 72 includes a widened bracket portion 78 connected to one end of the shaft sleeve 71 and which supports a reservoir housing 80 in which the glue roller 56 is rotatable. The housing 80 is completely closed and is supplied with liquid glue or adhesive through a quick connect conduit 82 (FIGS. 9 and 10). The conduit 82 includes a projecting portion 82*a* which extends into an opening in the housing 80 which has a flange 82*b* having a cutout 82*c* permitting the flange to be inserted behind a head 83*a* of a bolt 83. The flange 82*b* may be locked behind the bolt head by rotating the conduit so that cutout 82*c* is not aligned therewith.

A movable plate 84 and an adjustable doctor blade 86 (FIG. 24) are clamped to the housing on each side of the roller 56 and may be slid backwardly and forwardly for adjusting the clearance between the roller and the blades. The doctor blade 84 is moved for adjusting the amount of glue which will be picked up by the roller 56. For this purpose, the doctor blade 86 is slotted so that it may be slid backwardly and forwardly and accommodate the bolts 88. The blades are advantageously provided with a projecting portion (not shown) which may be brought to bear against roller 56 when it is desired to doctor glue from only a portion of the roller.

In the embodiment illustrated, the lower glue mechanism assembly 72 also includes a driving gear 90 (FIG. 23) which will mesh with an idler gear 92 driven by gear 64 which is freely carried on a shaft 62. The shaft 62 also carries a sprocket 94 which is driven by a chain 96 (see FIGS. 38, 22 and 23).

The arm 66 may be raised or lowered by rotating an adjustment screw 97 to raise or lower the operative position of the lower roller 56 (FIG. 25*a*).

In accordance with a further feature of the invention, shaft 71 of the lower glue mechanism 72 is connected to a movable block 104 which is provided with an adjustable cam set 98 for controlling the movement of an upper glue mechanism assembly generally designated 100. As shown particularly in FIG. 27, the adjustable cam mechanism 98 comprises a plurality of disc cams 102 adjustably mounted on a hub member 104 and set in position by means of a set screw carried on a plate 106. The position of the cams is indicated on a scale 107. The complete set of disc cams 102 may be rotated together or individually to change the position of the cam plates 102 on the hub member 104 and then they are secured by set screw 106. The knob 108 may be pulled out to disengage shaft 70 of the lower glue mechanism and permit removal of the entire mechanism from arm 66.

The upper glue mechanism assembly 100 includes a housing 112 (FIGS. 22 and 26) in which is rotatably supported the upper glue roller 54. The glue roller 54 is mounted on a shaft 114 which is rotatably supported on a sleeve portion 116 of an upper glue mechanism assembly frame 118. The exterior end of the shaft 114 carries a gear 120. Gear 120 meshes with the gear 90 of the lower glue mechanism assembly 72 and will be operatively driven in timed relation to the lower glue roller 56 (see FIGS. 23 and 24). The extreme outer end of the shaft 114 carries a roller follower 122 which can be arranged to move in operative engagement with the disc cam 102. In those instances where it is desired to provide for spot gluing, the frame 118 which carries the shaft 114 with the roller 54 may be moved upwardly and downwardly during machine operation for the purpose of applying glue at spaced locations along the flap. The frame 118 is pivotally supported on a shaft element 124 to permit such pivotal movement. The shaft 124 is mounted on a bracket extension 126 on the frame 58.

As indicated particularly in FIG. 26, the housing 112 is open at one end to accommodate the roller 54, and the roller 54 is positioned to maintain the level of glue or adhesive 127 which is continuously supplied through a conduit 128 fed from a bottle container 130 (FIGS. 1 and 6). In the present instance, the feed is indicated as being by gravity but, of course, a pump feed could be provided if desired. The conduit 128 is secured in a manner similar to conduit 82 (FIGS. 9 and 10).

A feature of the housing construction is the mounting of a doctor blade element or plate 132 which is held to the housing by screws 134 which ride in slots (not shown) of the doctor blade element 132. The slots are longitudinally elongated to permit movement of the doctor blade element 132 in the direction of the arrows 136 of FIG. 26. Control of the movement is by a knob member 138 which may be rotated to change the position of a threaded screw 139 which is threaded in the housing, and to advance a control disc 142 backwardly and forwardly. The control disc 142 is captive in a slot 144 of the doctor blade element 132, and thus rotation of the knob 138 will permit shifting of the doctor blade element 132. The doctor blade element 132 is shifted in order to accurately control its position in relation to the glue roller 54 and thus permits regulation of the amount of glue which is dispensed during the operation.

In some instances the blade element **132** is provided with a tip portion **132***a* of a durable plastic material such as Teflon which is not coextensive with the width of roller **54** but extends outwardly further than the remaining portion of doctor blade element **132** for the purpose of completely removing glue from the surface of the roller which it contacts.

The construction and arrangement of the lower and upper glue mechanism assemblies **100** and **72**, respectively, offer many advantages. Each can be easily disconnected from the drive for adjustment and maintenance purposes. The driving gears and sprockets may be easily adjusted in a similar manner. Each has its own glue supply for continuous gluing. When upper glue mechanism assembly **100** is removed, the lower glue mechanism assembly **72** may be positioned to glue the underside of the upper flap of container **38**.

As indicated schematically in FIGS. 38 and 39, the machine is driven from a main motor M having a shaft **145** which drives a sprocket wheel **146** and it, in turn, through a chain **148**, drives a sprocket **150** on a shaft **152** having a helical **154** which meshes with a helical gear **156**, the latter being on a shaft **158** which carries the sprocket **50**. The sprocket **50**, as mentioned previously, drives chain **48** and operates the tucker mechanism B. Shaft **158** also carries a gear **160** which rotates gear **162** affixed to shaft **161** to drive a large infeed pulley member **164** for the compressor conveyor D. Change gears **160** and **162** are easily accessible on the machine and may be easily replaced when it is desired to change the operating speed of the compressor conveyor D. The compressor infeed pulley **164** for the compressor conveyor D is mounted on the shaft **161** which is carried on an arm **159** which is pivotal on sleeve **165** which accommodates shaft **158** carrying the gear **156**. This arm **159** permits shifting of the infeed pulley **164** and the opposite infeed pulley **163** laterally to permit independent width change of the compressor conveyor D from the chain conveyor A to accommodate for the differences in thickness of the materials used in the container structure, such as between food board and corrugated paperboard, for example.

The chain **96** which is also trained around a sprocket **167** on the shaft **152** drives the glue mechanism, and another chain **166** trained around sprocket **169** of shaft **152** rotates a shaft **168** through sprocket **182** and clutch assembly generally designated **170** (see FIG. 12). Power transmission is from the sprocket chain **166** to the sprocket **182** which freely rotates on the shaft **168** (FIG. 38). Affixed on the shaft **168** is a clutch member **174** (FIGS. 11 and 12) which is driven a plate member **176** affixed to the sprocket **182** through the medium of a recess **178** on the plate member or rounded element and a ball **180** which rides in the recess.

The ball or rounded element **180** is urged into the recess **178** by means of a compression spring **183**, the force of which is controlled by an adjustment knob **184**. After the force on the spring **183** is set by rotating the knob **184**, the ball **180** will engage in the recess **178** to rotate the shaft **168** from the driving sprocket **182**. A chain **186** (FIG. 38) extends from the sprocket **185** on shaft **168** and engages a sprocket **188** of the conveyor A which is affixed to a shaft **190**. Also affixed to shaft **190** are the pusher sprockets **20** and **22**.

It should be appreciated that the shaft **168** for driving the chain conveyor A is isolated from the remaining mechanism such as the glue mechanism and tucker mechanism by means of the clutch so that overload of this conveyor will cause shut down of the driving motor M without regard to the load on the other operating mechanism.

If the chain conveyor A should become jammed, such as where the pushers **15** are blocked, the overload would cause the ball **180** to ride out of the groove **178**, causing the displacement of pin **185** against plate **187** and the relative rotation between the plate **176** and the clutch member **174**. The movement of the plate **187** causes a contact element **192** of a microswitch **194** to become energized to cut off power to the driving motor. Power is supplied to the driving motor M by actuating a start button on a control switch **195** (FIG. 6) to jog the machine until the ball **180** again falls into the recess **178**. The drive will thus be resumed with the ball and recess assuring that the timing will be as before and the pusher **15** will not be moved out of alignment.

As best indicated in FIGS. 7 and 8, the pushers **15**, which are pivotally connected at their forward ends to the chains **12** and **14**, will drop backwardly as indicated by the arrow **196** after they leave the guiding channels **21** and **23**. They will fall back and assume a position disposed with their front face **15***b* disposed substantially parallel to the chains **12** or **14** with which they are associated, until the pusher is swung around to its lowermost position below the sprocket **22**, at which time a guide member **198** insures that it will be guided in a parallel manner with the chains **12** or **14**.

When the pusher element advances the container **38** to the endless belt pressure conveyor B, the containers are led with increasing gripping pressure between the nips of spaced parallel endless belt conveyors **200** and **202**. As indicated in FIGS. 1, 3, 4, 6 and 21, one end of each of the belts is trained to run around respective pulleys **164** and **163** and at the opposite end they are trained to run around pulleys **204** and **206**. Infeed pulleys **164** and **163** are mounted within the main frame portions **58** and **60** on the arms **159** and the outward or discharge pulleys **204** and **206** are carried at the end of the frame pieces **208** and **210** which are supported on upstanding plate brackets or stands **212**, **212** having rollers or casters **216**.

The conveyor belts **200** and **202** may be moved laterally relatively by rotating a shaft **209** having a sprocket **211** to move chain **219** and sprocket **215** and a shaft **217** (FIG. 38*b*). Shafts **209** and **219** are threaded into the opposite frame and extensions **60***a* and **60***b* and rotation thereof is effective to move the opposite frame and extensions toward and away from the frame **58** indicated in FIGS. 1 and 3.

Shaft **209** is rotated by a crank **258** and it carries a sprocket **213** driving a chain **219** to rotate sprocket **213′** on shaft **209′**. Shaft **209′** carries sprocket **211′** mounted on shaft **221** which carries sprocket **211″** driving sprocket **215** through chain **219″** to rotate shaft **217′**. Threaded shafts **209**, **209′** and **217** and **217′** engage the opposite main frame **60** and the extending frame portions at each end, respectively, for moving the frame portions inwardly and outwardly.

In addition to the major inward and outward adjustment of the endless belt pressure conveyor B, slight variations of tension on the conveyor belts **200** and **202** may be effected by means of a conveyor adjustment mechanism (FIG. 6) comprising a sliding block member **218** which is slidable in an end portion of the frame and carries a guide pulley **220**, the position of which may be adjusted by rotating a threaded knob **222** to shift a knobbed screw **224** for the purpose of advancing the block **218** and adjusting the position of the guide rollers **220**. The movement of the rollers **220** tensions the belt between the main rollers **163** and **204** and a respective guide roller **226**.

As best indicated in FIG. 6, a further feature of the invention is the provision of a plurality of fixed rollers **228** against which the respective conveyor belts **200** and **202** may bear against displacement in outward opposite directions by the container which is moved and compressed therebetween. In order to facilitate adjustment of the spacing between the conveyor belts **200** and **202** for maintaining an accurate compression on the container **38** which is to be delivered therebetween, some of the rollers **230** are mounted between frame plates **232** and

234 in a manner permitting their easy removal. The removable rollers 230 are all mounted within a box member 236 (FIG. 6) having an openable portion or cover 238 which may be opened to permit access to the rollers 230 to permit them to be lifted out and removed from effective operation. Since the outer periphery of the associated pulleys 163 and 164 lies along an oblique line with respect to the peripheries of the individual rollers 230 it can be seen that the inward taper of the conveyor belts 200 and 202 will be effected by the number of rollers 230 which are left in position (FIG. 17). If, for example, the roller indicated R in FIGS. 6 and 17 was the first roller to be encountered by the pulley belt 202 with the ones upfeed of that roller having been removed, then the full compressive effect of the belt conveyors on the container would not be effected until the package was substantially opposite the roller R. In a similar manner, the taper inwardly of the belt would be similarly controlled so that the grasping of the package would be uniform but the adjustment for compressive purposes would be very accurate. The containers remain between the conveyor belts 200 and 202 until they reach the delivery end marked by the arrow 240 where they are either packaged into larger containers or moved out for shipment. The active reaches, that is, the opposed central portions of the conveyor belts 200 and 202 are supported by bottom plates 234 against downward movement and are guided on the return sides in upper and lower channel elements 300 and 302. At the outboard or delivery end of the compressor conveyor D, an adjusting nut is provided for shifting this end independently of the other end for connecting or changing the parallel alignment of the belts (FIGS. 17, 18, 19 and 20).

A machine constructed in accordance with the present invention has many desirable features. For example, top guiding of the containers may be effected for the purpose of holding the containers down by guide bars 242 and 244 (FIGS. 1 and 6). These guide bars 242 and 244, independently of a fixed upper top bar 246, may be adjusted vertically by movement of yoke members 248 and 250 at each end which may be simultaneously adjusted by rotating a shaft 252 (FIG. 6) to drive four corner sprockets 254. The top fixed bar 246 carries the glue reservoir container 130.

In order to operate the machine, the machine is first oriented so that it is in a position to receive containers 38 from an automatic feed or in a position to be fed manually at an operating station. Thereafter, the machine is adjusted for container size by adjusting the overhead guide rods 242 and 244 and by adjusting the spacing between the frames 58 and 60. This may be done by merely rotating a removable crank 258 to drive shafts 217, 217', and 209, 209' which cause inward or outward movement of the opposite frame 60 in accordance with the direction of rotation.

Thereafter, container supporting bar 266 may be adjusted in relation to the chains 12 and 14 by releasing clamping element 270 on securing column members 272 to permit the collars to be slid on stub shafts 274 for the purpose of inward and outward adjustment in respect to the stationary bar (see FIGS. 1, 2, 5 and 6).

After the machine is adjusted to accommodate a certain size of container in respect to the chain conveyor A, the endless belt pressure conveyor D is set by the insertion or removal of the rollers 230. After this is done, the tension of the belts 200 and 202 is set by the tensioning control and the glue mechanism is next set for proper operation.

The glue mechanism may be set to operate to glue either the top flap or the bottom flap and either continuously or intermittently.

As indicated in FIGS. 28 to 37, the pushers 15 advance the container 38 after the container has been filled by an operator or by other automatic machinery and with the flaps extending outwardly on one or both sides. In the embodiment illustrated, both sides are indicated in position for folding and gluing.

The plow elements 40 are arranged to tuck in the forward flap 38*f* and the tucker element automatically tucks in the trailing flaps 38*r*. The top flap 38*t* and the bottom flap 38*b* are separated and the bottom flap aligned for direction between the rollers 54 and 56 with one or bore rollers being set to apply glue. If glue is not to be applied to the bottom of the flap, then the reservoir for the bottom roller 56 would not be supplied with glue. If it is desired to supply the top surface of the bottom flap 38*b* with an intermittent line of gluing, then the roller 54 would be reciprocated upwardly during its contact period with the bottom flap 38*b*. Upward reciprocation is set in accordance with the setting of the cam 98.

As indicated in FIGS. 32 and 33, after the glue is applied the lower flap is directed upwardly and inwardly by means of a curved rod 278 disposed along the path of movement. Similarly, the upper flap is directed by a curved piece of metal or folding element 280 downwardly over the bottom flap which, in this instance, has been supplied with glue. This action is indicated from the side in various views in FIGS. 34, 35 and 36. After the flaps have all been pressed downwardly, they are delivered in their folded condition between the conveyor belts 200 and 202 which are set to compress the flaps into sealing engagement and hold them in this manner for the complete length of the conveyor D. Since the conveyor D does not require the spacing necessary for feeding the containers along the chain conveyor A, the number of containers which may be handled by it may be increased over that handled by the chain conveyor. By providing speed change gears at the conveyor pulley drive which are easily accessible as indicated schematically in FIG. 9, it is possible to easily change the speed of the endless belt pressure conveyor D.

An important feature of the operation of the chain conveyor is that the timing of the pushers 15 of each of the chains will be such that the pushers will always be in lateral alignment and accurately timed. By insuring that the clutch 170 is only in the drive to the pusher chains so that the remaining mechanism does not provide a drag load on the operation of the clutch, it is assured that the chain conveyor A will be stopped at all overload conditions and the containers will not be crushed or damaged.

The pushers 15 are mounted on the individual chain links so that a notched forward edge 15*d* rests directly on a front top face of the chain link and there is no danger that the pusher will wobble or tend to fall forward as it is moved by the chain (FIG. 13). In FIGS. 15 and 16 it can be seen, how the pushers 15 are guided over a rounded guide disc 34*a* which provides a rounded guide surface for the lower surface of the pusher 15. The pusher 15 is then guided until the side block elements 19 become defined in the curved guide formed in the plates 21 and 23. The guide blocks 19 are advantageously made so that they may be removed and replaced when wear occurs. Wear is reduced by making these elements of a hardened material.

The glue mechanism which forms an important feature of the present invention is mounted and constructed for accessability of all of the parts thereof. Alignment of the glue rollers and also alignment of the reservoir of each roller assembly may be simply and easily made. Since the assemblies are supported on sleeves which are held on pivotal arms when the angular orientation of the arms is shifted it is a simple matter to also shift the position of the associated reservoir so that the glue level may be maintained in a proper orientation. For this purpose the various removable clamping arms are provided.

A feature of the compressor conveyor construction is that the infeed pulleys 163 and 164 are mounted for pivotal shifting movement and also for easy removal to permit the machine to be operated for tucking in the flaps of containers where the locked type of carton is employed. The tensioning of the conveyor belt of the compressor

conveyor D may be effected in a simple manner by the adjustable guide rollers on each side, and any adjustment which is made will not influence the effective length of the compressor conveyor.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that this invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A package end flap folding and sealing machine comprising a pair of spaced upright frame elements, a chain conveyor supported on each of said frame elements, each chain conveyor including longitudinally spaced infeed and discharge sprocket wheels mounted for rotation about a substantially horizontal axis and an endless chain trained to run around said sprockets and trained to run with an upper reach extending along adjacent the top of said frame, a plurality of pusher elements connected to each of said chains, at uniformly spaced locations with respective pusher elements of each chain being laterally aligned with pushing a container in position therebetween, guide rail means on said frame elements for supporting a container for movement along said frame by said pusher elements, means disposed along said frame for folding and sealing the end flaps of said container advanced by the pusher element, means to move said chains and rotate said sprockets, means connected between said frame elements for moving said elements and associated chain conveyors in lateral directions toward and away from each other for adjusting said frame elements in respect to the containers being fed, a tensioning sprocket for engaging each of said chains, a link member providing a guide for said pusher elements between said tensioning sprocket and said infeed sprocket and pivotally connected to respective ones of said infeed sprockets and located therebelow, said tensioning sprocket being rotatably mounted on the free end of said link member, and means for adjusting the positioning of said link member for adjusting the tension on the chain by varying the positioning of the tensioning sprocket in respect to its engagement with its associated chain.

2. A package end flap folding and sealing machine according to claim 1, wherein said pusher is a substantially U-shaped element having an upstanding front portion and being pivotally connected to said chain adjacent the lower end of said front portion, guide means for guiding said pusher in an upright position as it travels at the upper reach of said conveyor, said discharge sprocket being located below and spaced from said guide means so that the chain slopes downwardly from said pusher sufficiently to cause said pusher, when it comes to the end of said guide means, to pivot backwardly and move downwardly so that the forward portion does not project above the line of package feed.

3. A package end flap folding and sealing machine according to claim 1, wherein said link defines a slideway for said pusher for guiding said pusher upwardly to the upper reach of said chains.

4. A package end flap folding and sealing machine comprising a pair of spaced upright frame elements, a chain conveyor supported on each of said frame elements, each chain in coveyor including longitudinally spaced infeed and discharge sprocket wheels mounted for rotation about a substantially horizontal axis and an endless chain trained to run around said sprockets and trained to run with an upper reach extending along adjacent the top of said frame, a plurality of pusher elements connected to said chain at uniformly spaced locations with respective pusher elements of each chain being laterally aligned for pushing a container in position therebetween, guide rail means on said frame elements for supporting a container for movement along said frame elements by said pusher elements, means disposed along said frame for folding and sealing the end flaps of said container, means to move said chains and rotate said sprockets, connected between said frame elements for moving said elements in lateral directions toward and away from each other for adjusting said frame elements in respect to the containers being fed, a compressor conveyor disposed in alignment with said chain conveyor comprising a pair of endless belts, first and second longitudinally spaced pulleys for guiding each of said belts with the opposed faces of said belts disposed vertically and in opposite relationship for compressing a container therebetween for holding during drying, and a plurality of rollers disposed adjacent the interior of the opposed faces of the opposed portions of said belts forming a guide for said belts, at least some of said rollers being removable for varying the spacing between said belts at various locations along the length thereof.

5. A package end flap folding and sealing machine according to claim 4, including a guide pulley disposed adjacent said first and second pulleys, and movable tensioning means disposed between said guide pulley and one of said first and second pulleys and being movable in a direction to bend said belt around said guide pulley and to tension said belt away from the adjacent first and second pulley.

6. A package end flap folding and sealing device according to claim 5, wherein said movable tensioning means includes a block slidably mounted on said frame, and a member threadably engaged in said frame and being rotatable to displace and block for tensioning the conveyor belt.

7. A package end flap folding and sealing machine according to claim 4, wherein the outer periphery of one of said first and second pulleys is displaced out of alignment with said rollers, at least one of the rollers adjacent to said pulleys being movable for varying the taper of feed from said pulley to said guide roller for the purpose of varying the spacing between said belts at the entrance of said compressor conveyor.

8. A package end flap folding and sealing machine comprising a pair of spaced upright frame elements, a chain conveyor supported on each of said frame elements, each chain conveyor including longitudinally spaced infeed and discharge sprocket wheels mounted for rotation about a substantially horizontal axis and an endless chain trained to run around said sprockets and trained to run with an upper reach extending along adjacent the top of said frame, means for driving said chain conveyors, a plurality of pusher elements connected to each of said chains at uniformly spaced locations with respective pusher elements of each chain being laterally aligned for pushing a container in position therebetween, guide rail means on said frame elements for supporting a container for movement along said frame by said pusher elements, means disposed along said frame for folding and sealing the end flaps of said container, said means including a lower glue mechanism assembly comprising an arm pivotally mounted on said frame, a glue assembly mounted on said arm comprising a glue reservoir, a glue applicator shaft having an applicator roller rotatable in said reservoir and being in a position for contact by a flap of the container being advanced on said chain conveyor to apply glue to the flap, and gear means on the opposite end of said applicator shaft for connecting said glue roller to said means for driving said chain conveyor, said means to drive said chain conveyor, including a drive gear disposed for meshing engagement with said gear means for driving said glue roller, said arm being pivotal upwardly or downwardly to change the position of said glue assembly with said applicator roller while maintaining a driving connection between said drive gear and said gear means.

9. A package end flap folding and sealing machine according to claim 8, wherein said housing for said glue reservoir includes a closed housing formed as part of said glue assembly, a plate closing a portion of said

housing having an end bearing against said roller, and means for adjustably positioning said plate along said housing for varying the spacing between said plate and said roller.

10. A package end flap folding and sealing machine according to claim 9, wherein said means adjustably mounting said plate includes an elongated slot defined on said plate, a bolt extending through said slot and holding said plate to said housing, and a threaded member engaged with said plate and rotatable for adjusting the position of said plate in respect to said roller.

11. A glue mechanism for use in respect to machines for sealing the end flaps of containers, comprising a first arm adapted to be pivotally connected to a machine element at its one end and having a bearing recess on its opposite end, a glue mechanism assembly pivotally supported on the bearing recess of said arm, said assembly including a shaft having gear means adjacent one end for connecting to a drive mechanism for rotating said shaft, a glue roller affixed to the opposite end of said shaft, and glue reservoir housing means supported integrally with said shaft and said glue roller, the entire assembly including said shaft glue roller and gear means being removably mounted on said arm.

12. A glue mechanism according to claim 11, including a closing member pivotally connected to said arm and adapted to close around said shaft for holding said shaft on said arm.

13. A glue mechanism for package end flap folding and sealing machines and the like, comprising a supporting arm adapted to be pivotally connected to a machine at its one end and having a bearing receiving recess defined at its opposite end for supporting a glue assembly therein in an operative position, and a lower glue mechanism assembly comprising a sleeve adapted to be supported in the bearing recess of said arm, a shaft rotatable in said sleeve and having a gear at one end for connection to operating the rotating gear of associated machinery, and a glue roller at an opposite end arranged along a container feed line for gluing the flaps of a container, said assembly further including a housing defining a glue reservoir, and a second arm for supporting an upper glue mechanism assembly, said second arm adapted to be pivotally connected to a machine at its one end for extending in a direction toward said first arm with the opposite end of said second arm having an upper glue roller mechanism receiving recess disposed to align with the recess of said underlying arm, and an upper glue mechanism assembly supported on said second arm with recess, said upper glue mechanism assembly including a rotating shaft having a gear adapted to engage with the gear of said lower glue mechanism assembly.

14. A glue mechanism according to claim 13, including a cam carried on the shaft of said lower glue mechanism assembly, and follower means on the upper glue mechanism assembly adapted to engage said cam for the purposes of lifting said assembly clear of a container fed by the machine when the glue mechanism assembly is not to be operative on said container.

15. In a machine including a main frame, a driving gear mounted on said main frame, the improvement comprising an upper and a lower glue mechanism assembly, a first arm pivotally supporting said lower glue mechanism assembly in a position so that it may be pivotally raised from said frame, said lower glue mechanism assembly having a first gear adapted to engage said driving gear, and a second arm pivotally supporting said upper glue mechanism assembly for positioning above said lower glue mechanism assembly, said upper glue mechanism assembly including a second gear adapted to overlie and be positioned in meshing engagement with said first gear.

16. A glue mechanism according to claim 15, wherein said lower glue mechanism assembly includes a frame comprising a housing forming a reservoir for glue, means at one end of said housing for delivering glue to said housing, and adjustable doctor blade means including a plate closing one end of said housing having an edge abutting against said roller, and means for shifting said plate laterally.

17. A compressor conveyor for compressing the end flaps of packages after they had adhesive applied thereto and had been folded, comprising a first belt conveyor comprising a pair of first and second longitudinally spaced infeed and discharge pulley members and a belt trained to run around said pulley members, a second pair of longitudinally spaced infeed and discharge pulley members and a second belt trained to run around said second pair of pulley members, said belts having opposed active reaches with belt faces disposed vertically for compressing containers therebetween, a plurality of rollers disposed along the length of said opposed reaches interiorly of said belt preventing inward displacement of said belt when a container is carried thereby, at least some of said rollers being arranged interiorly of the periphery of the infeed pulleys and being removable whereby to vary the inward tapering feed of said belt toward the discharge thereof.

18. A compressor conveyor according to claim 17, wherein said rollers are held by upper and lower frame elements, said removable rollers having roller pins which extend through openings in said frame elements, and a displaceable cover member biasing said pins in position to prevent removal thereof, said cover member being removable to permit withdrawal of said roller member.

19. A compressor conveyor according to claim 17, including means for tensioning said belt comprising a guide roller arranged on the exterior of said belt adjacent said entrance roller, and a tensioning roller disposed between said guide roller and said entrance roller, and means mounting said tensioning roller permitting displacement thereof for tensioning said belt between said guide roller and said entrance roller.

20. A package end flap folding and sealing machine comprising a pair of spaced upright frame elements, a chain conveyor supported on each of said frame elements, each chain conveyor including longitudinally spaced infeed and discharge sprocket wheels mounted for rotation about a substantially horizontal axis and an endless chain trained to run around said sprockets and trained to run with an upper reach extending along adjacent the top of said frame, means for driving said chain conveyors, a plurality of pusher elements connected to each of said chains at uniformly spaced locations with respective pusher elements of each chain being laterally aligned for pushing a container in position therebetween, guide rail means on said frame elements for supporting a container for movement along said frame by said pusher elements, means disposed along said frame for folding and sealing the end flaps of said container, said means including a lower glue mechanism assembly comprising an arm pivotally mounted on said frame, a glue assembly mounted on said arm comprising a glue reservoir, a glue applicator shaft having an applicator roller rotatable in said reservoir and being in a position for contact by a flap of the container being advanced on said chain conveyor to apply glue to the flap, gear means on the opposite end of said applicator shaft for connecting said glue roller to said means for driving said chain conveyor, said means to drive said chain conveyor including a drive gear disposed for meshing engagement with said gear means for driving said glue roller, a reservoir container mounted above said frame, and a conduit connected to said housing including a quick connect tube having an extended portion adapted to fit in an opening in said glue mechanism reservoir, and including a surrounding flange portion having a recess, said housing having a bolt member with a head of the size to accommodate the flange recess located adjacent the opening in said housing to permit insertion of the flange portion thereon only when the re-

cess of said flange portion is aligned with said bolt member, said flange portion being rotatable after insertion to lock said flange behind said bolt member.

21. A package end flap folding and sealing machine comprising at least one chain conveyor including longitudinally spaced infeed and discharge sprocket wheels mounted for rotation about a substantially horizontal axis and an endless chain trained to run around said sprockets and trained to run with an upper reach extending along substantially horizontally, a plurality of pusher elements connected to said chain at uniformly spaced locations, a link member providing a guide for said pusher elements pivotally connected to said infeed sprocket and extending downwardly and towards said discharge sprocket therefrom, said pusher element including an upstanding forward portion and a trailing portion, said forward portion being pivotally connected to said chain guide means disposed along the horizontal upper reach of said chain for guiding said pusher element so that the forward portion extends substantially vertically and the trailing portion is disposed substantially horizontally in alignment with the top of said chain, said link member maintaining said forward portion of said pusher element upright to extend substantially perpendicular to said chain when said pusher element moves over said link member, a tensioning sprocket carried on the free end of said link member and engaged with said chain, and means for adjusting the positioning of said link member with said tensioning sprocket in directions toward and away from said infeed sprocket to adjust the tension on said chain and to also vary the incoming feed angle of said pusher elements as they ride over said link to said infeed sprocket.

22. A package end flap and folding and sealing machine according to claim 21, wherein said pusher includes an upstanding forward portion having a lower edge directly above the top edge of said chain, and a substantially horizontally extending trailing portion extending outwardly beyond the sides of said chain and being movable downwardly below said chain and out of a horizontal position to an inclined position to bring the forward portion backwardly to a substantially horizontal position when said trailing portion is not resting on a guide member, said guide means guiding said trailing portion along a substantially horizontal path and holding said forward portion substantially upright along the upper reach of said chain, said forward portion having the lower corner thereof contacting the forward portion of said chain and preventing the forward tipping of said pusher beyond a position at which the forward edge of said pusher is substantially vertical.

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