Nov. 21, 1967 E. F. ROWEKAMP 3,353,331

CASE LOADER

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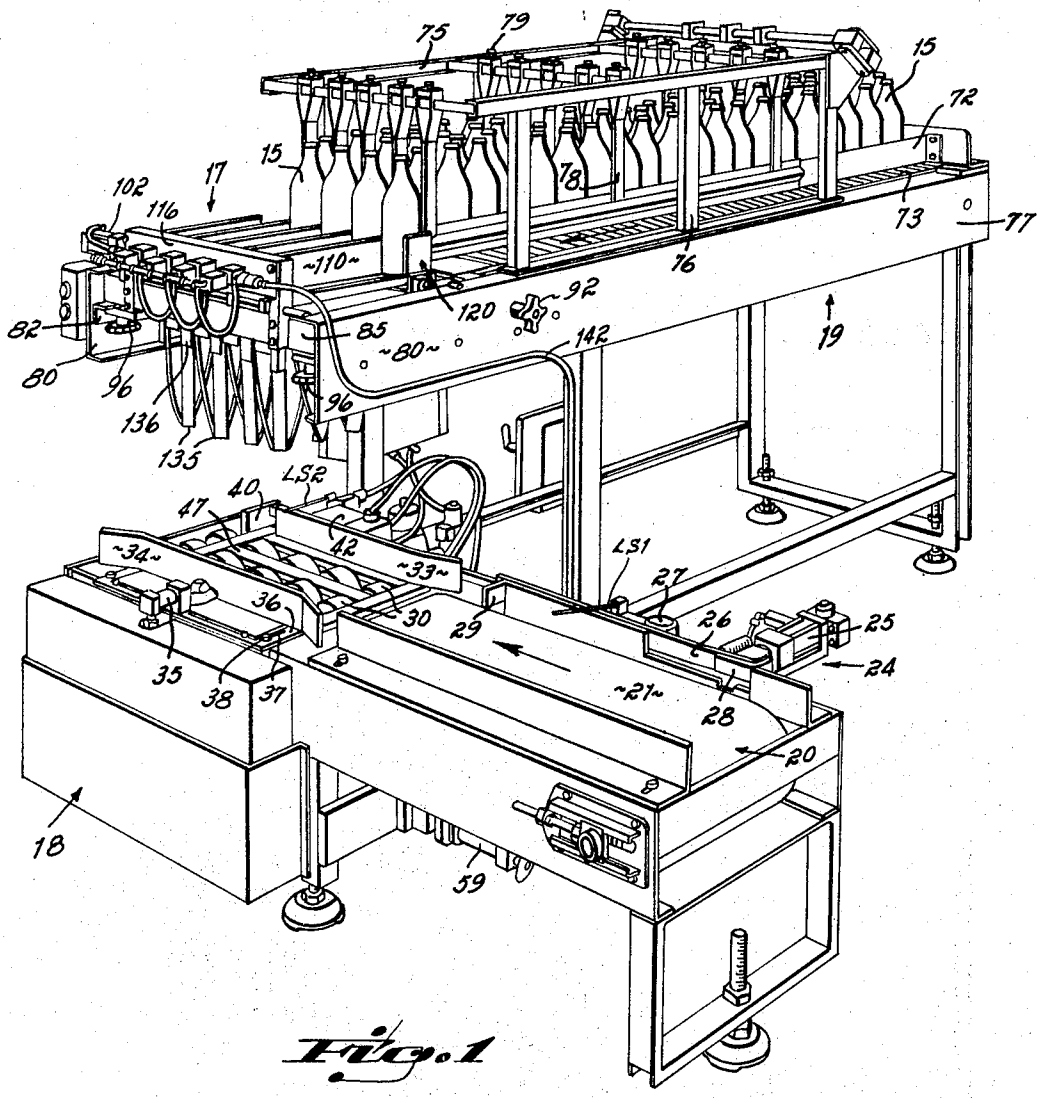

Fig. 1

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CASE LOADER

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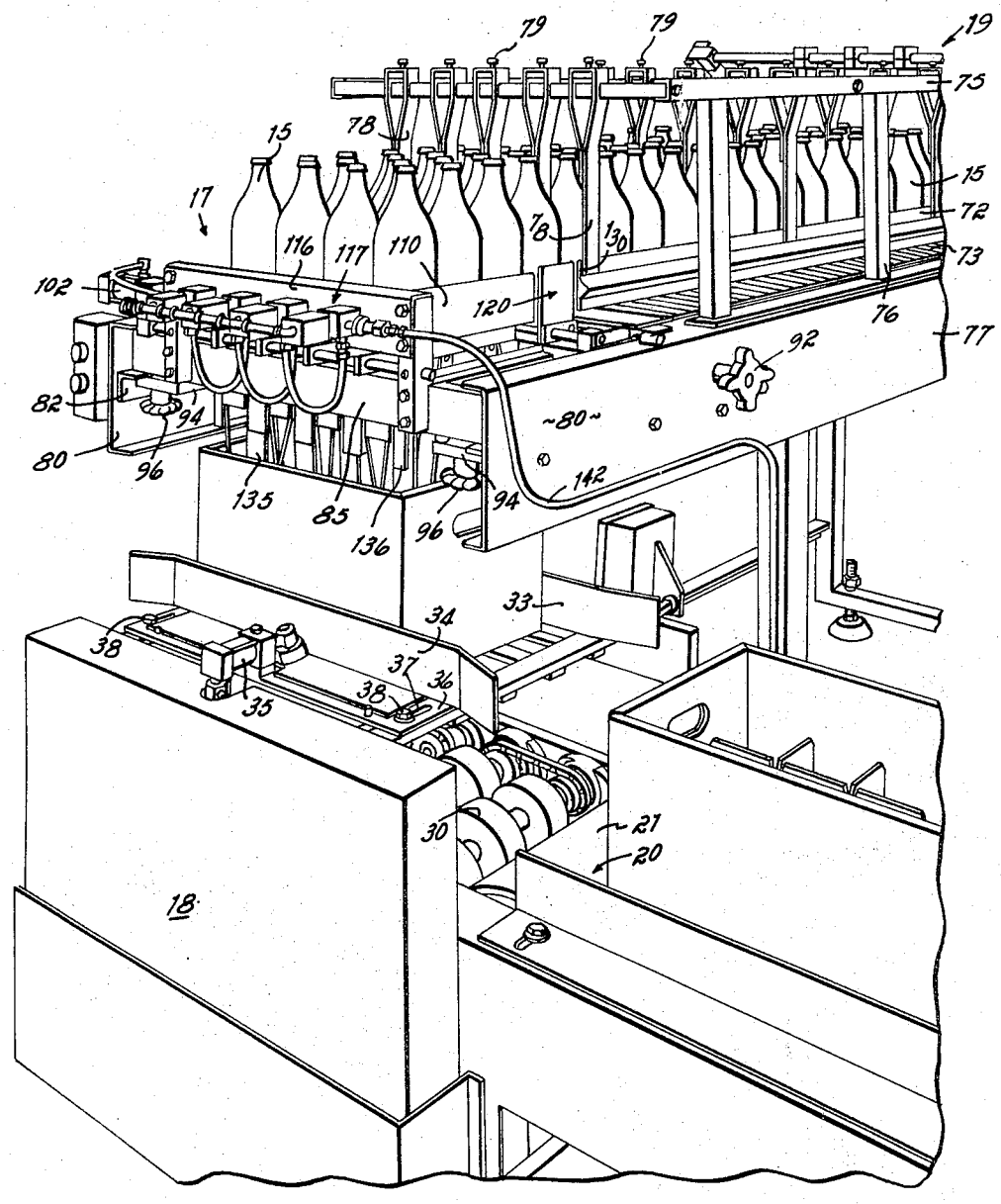

Fig. 2

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CASE LOADER

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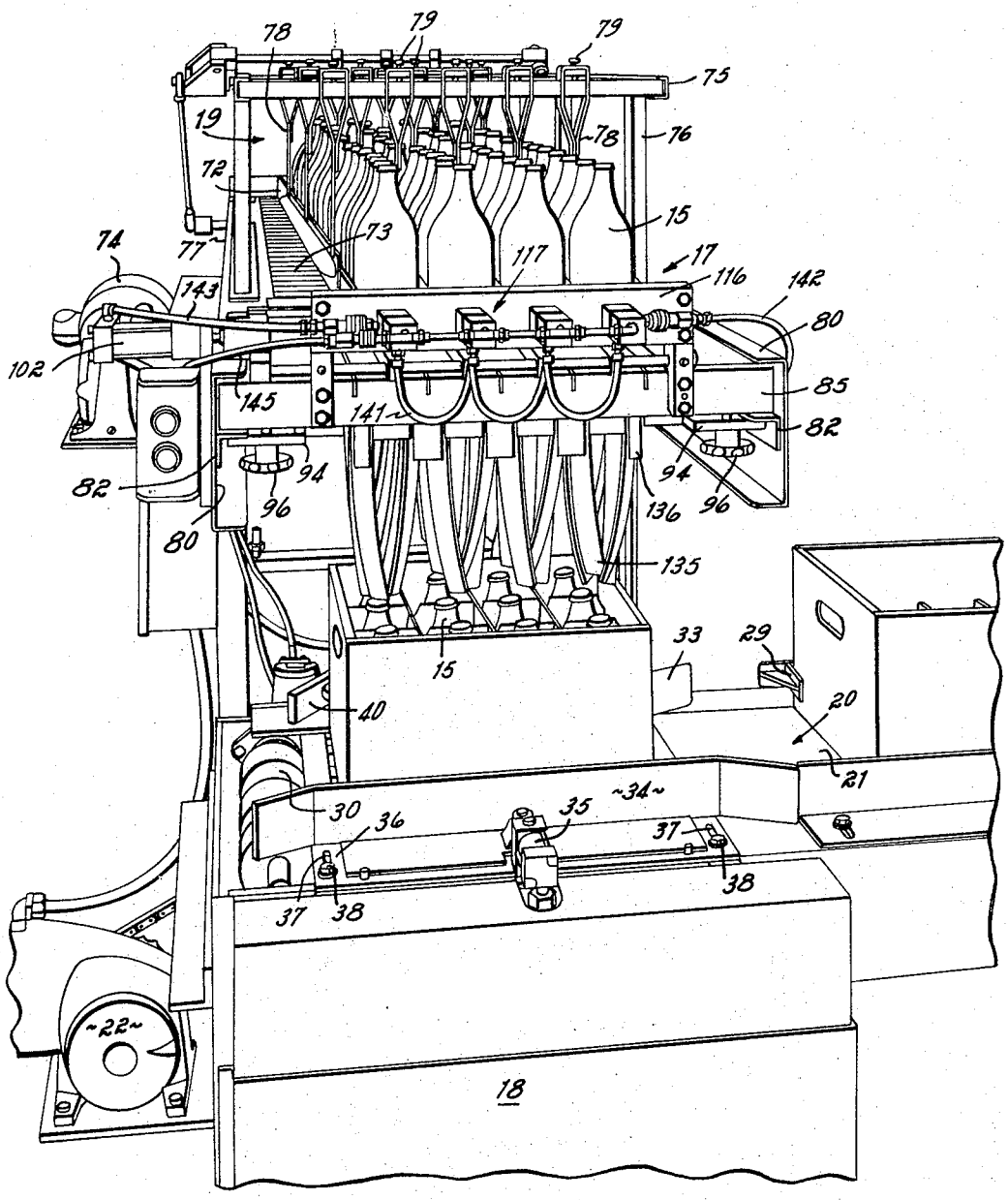

Fig. 3

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CASE LOADER

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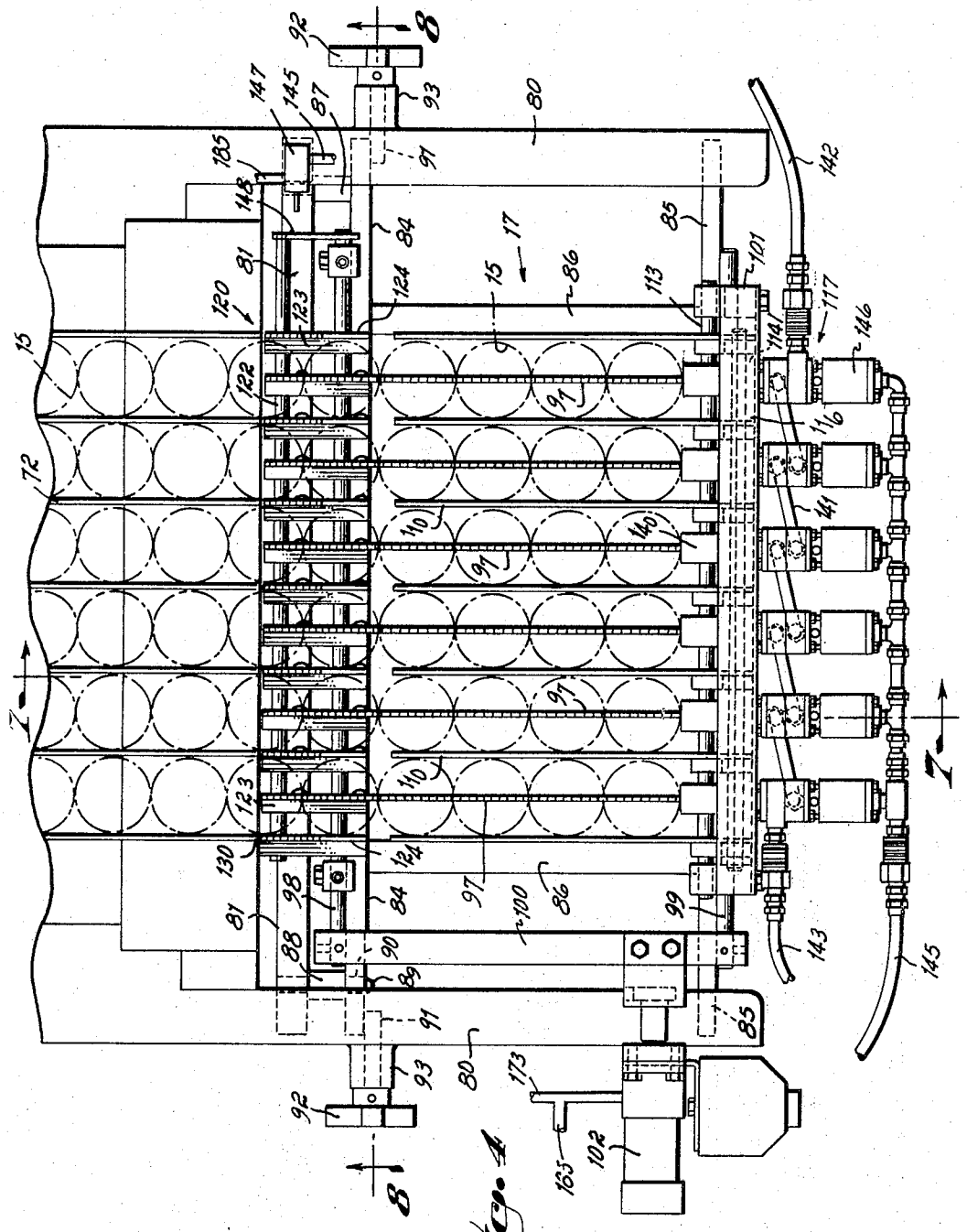

Fig. 4

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CASE LOADER

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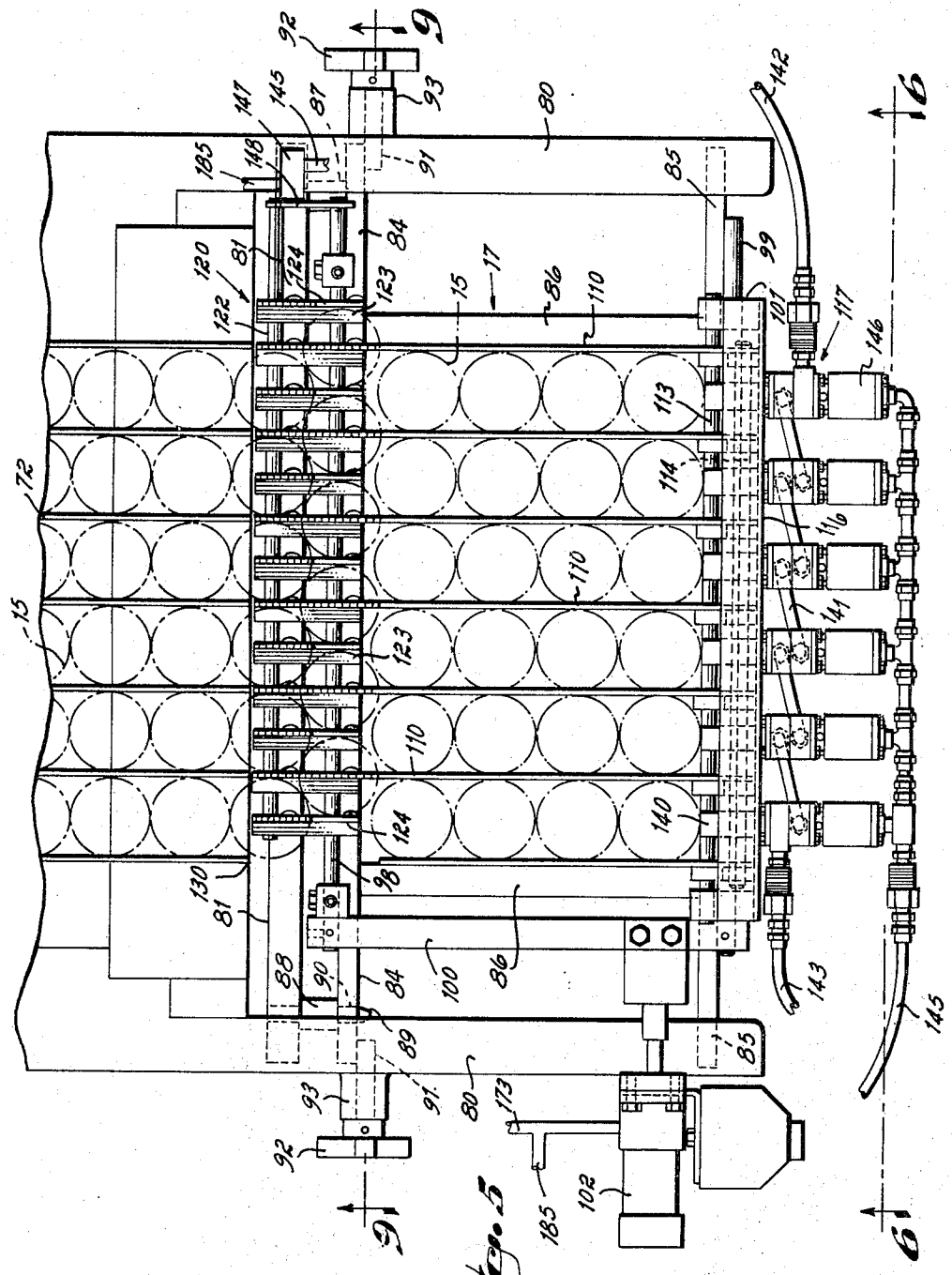

Fig. 5

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CASE LOADER

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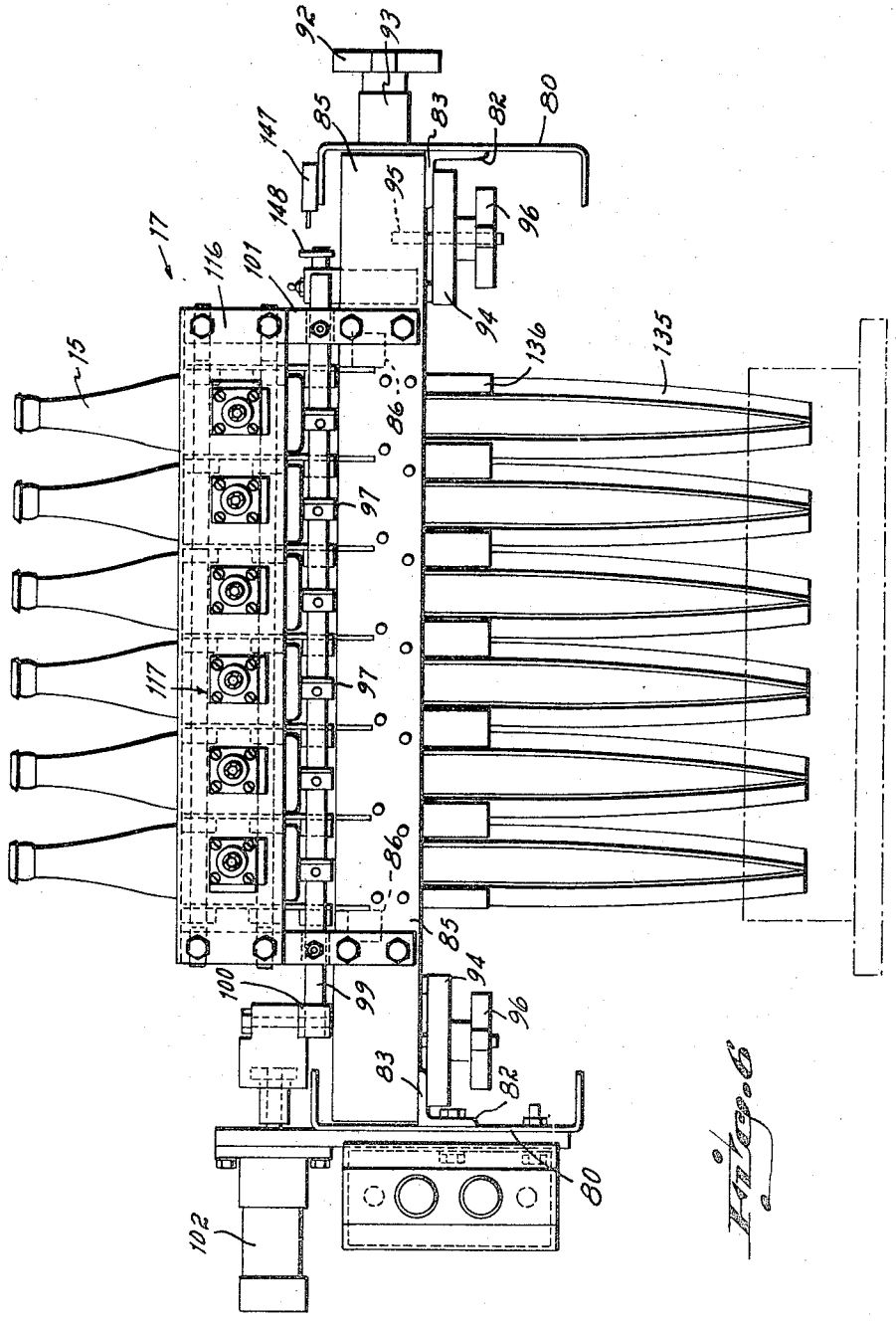

Fig. 6

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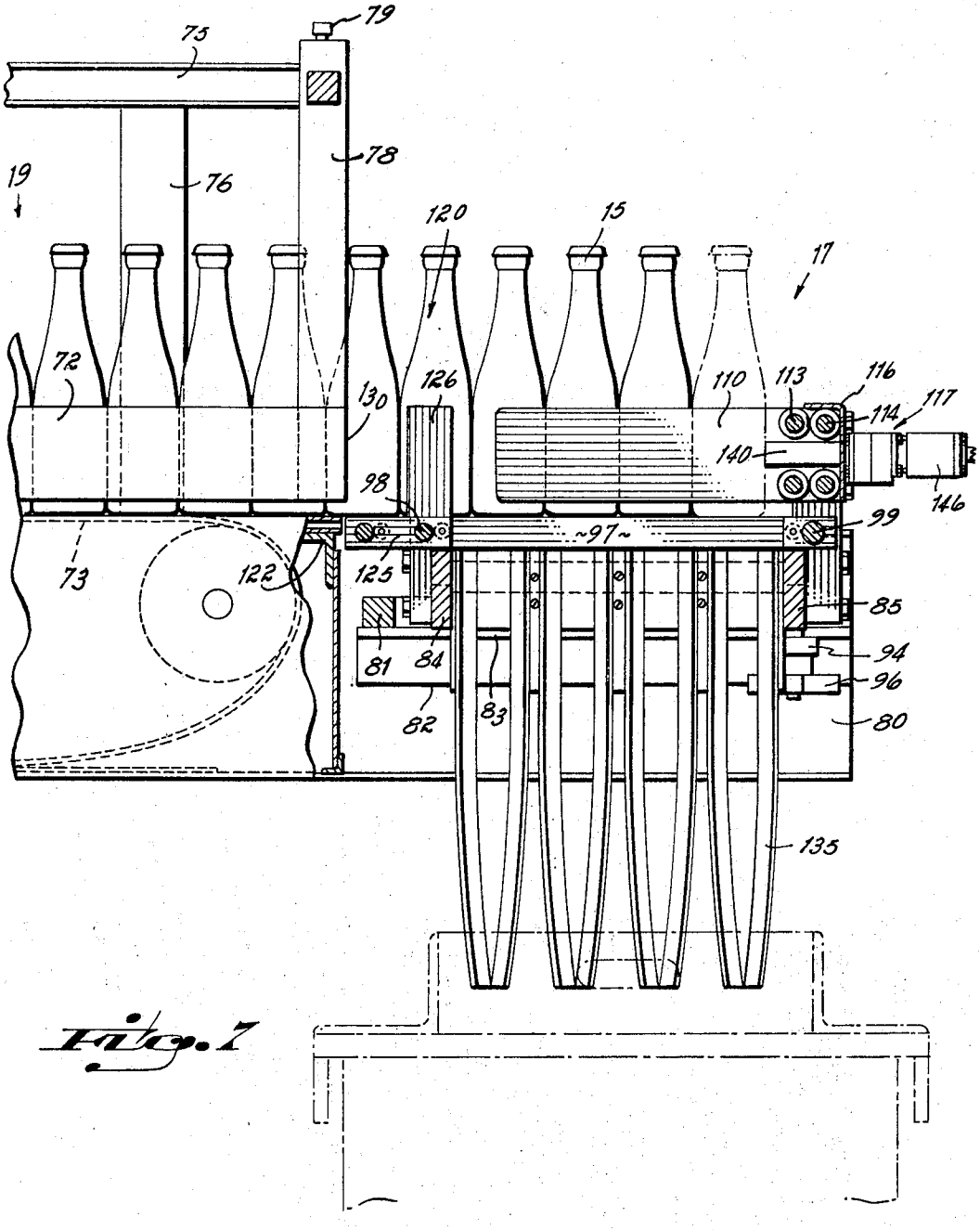

Fig. 1

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CASE LOADER

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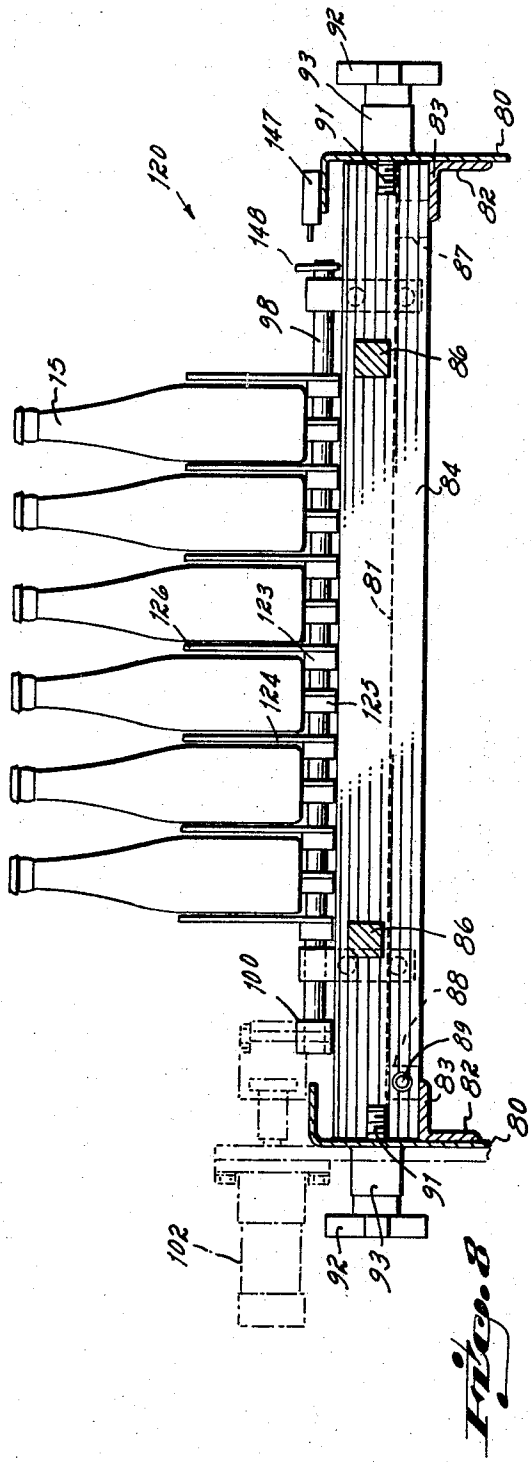

Fig. 8

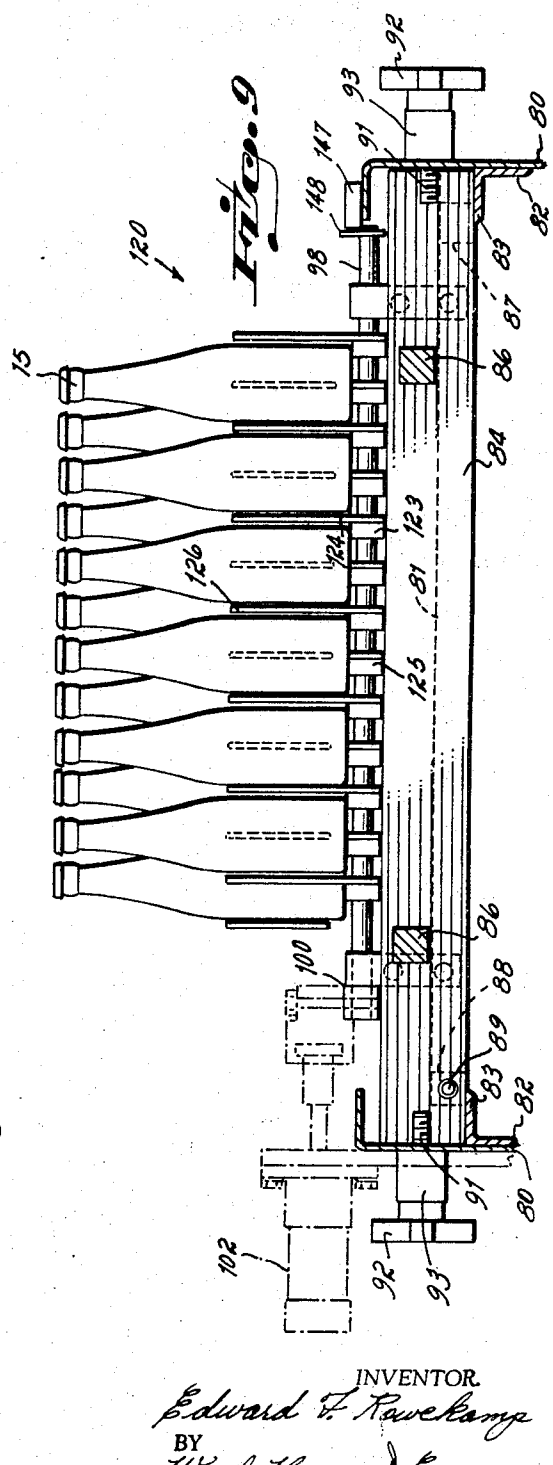

Fig. 9

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CASE LOADER

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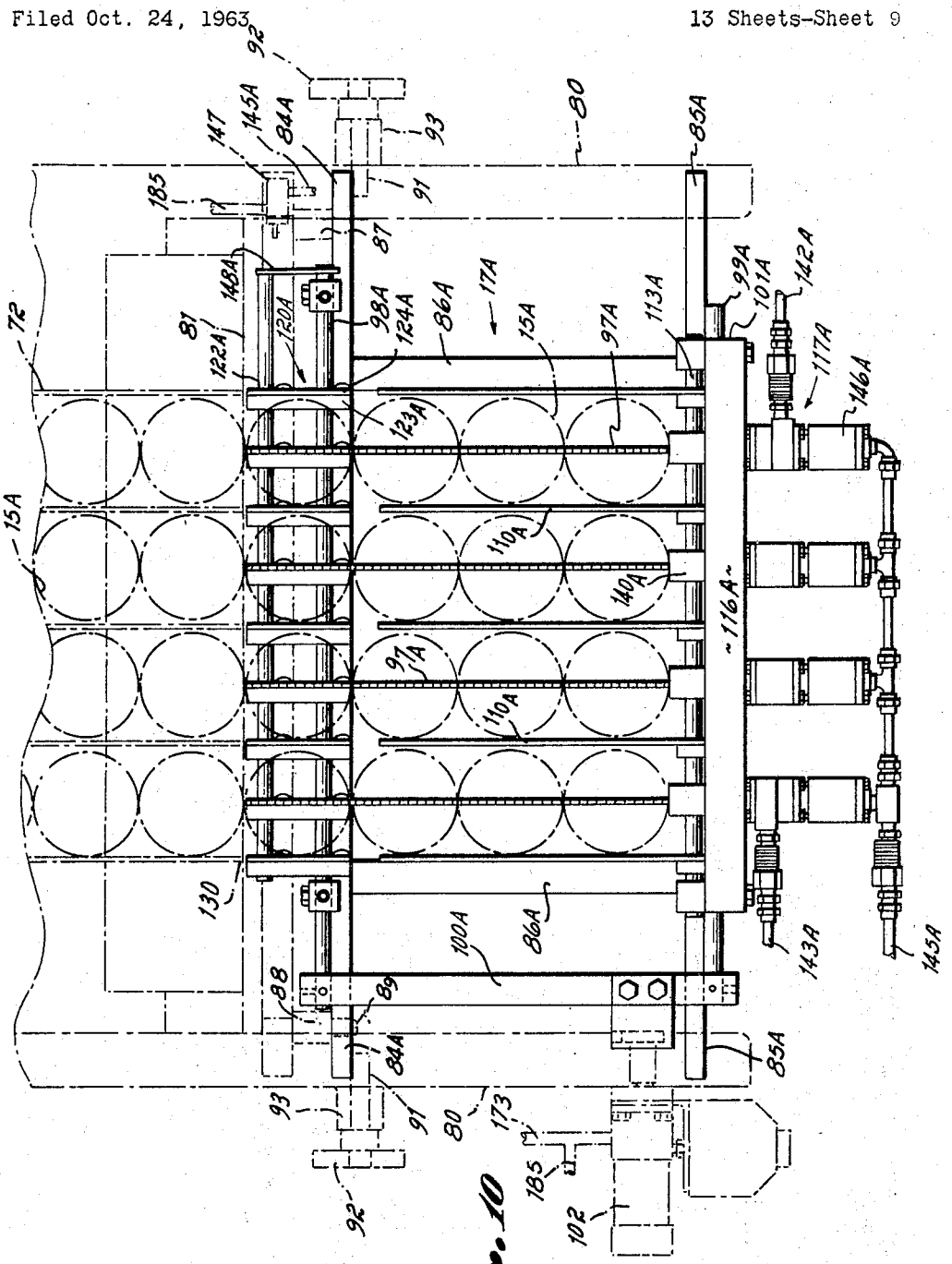

Fig. 10

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CASE LOADER

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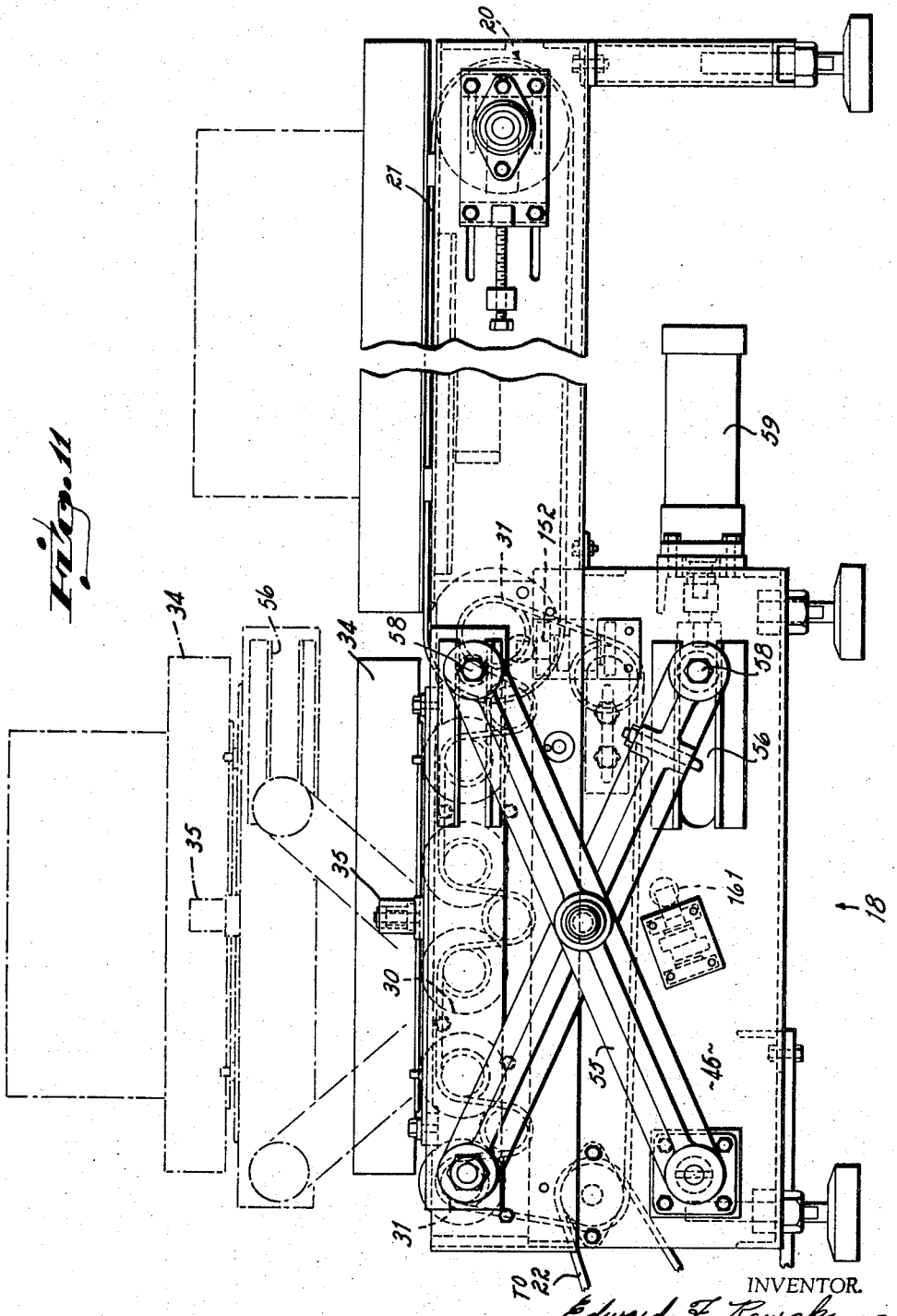

Fig. 11

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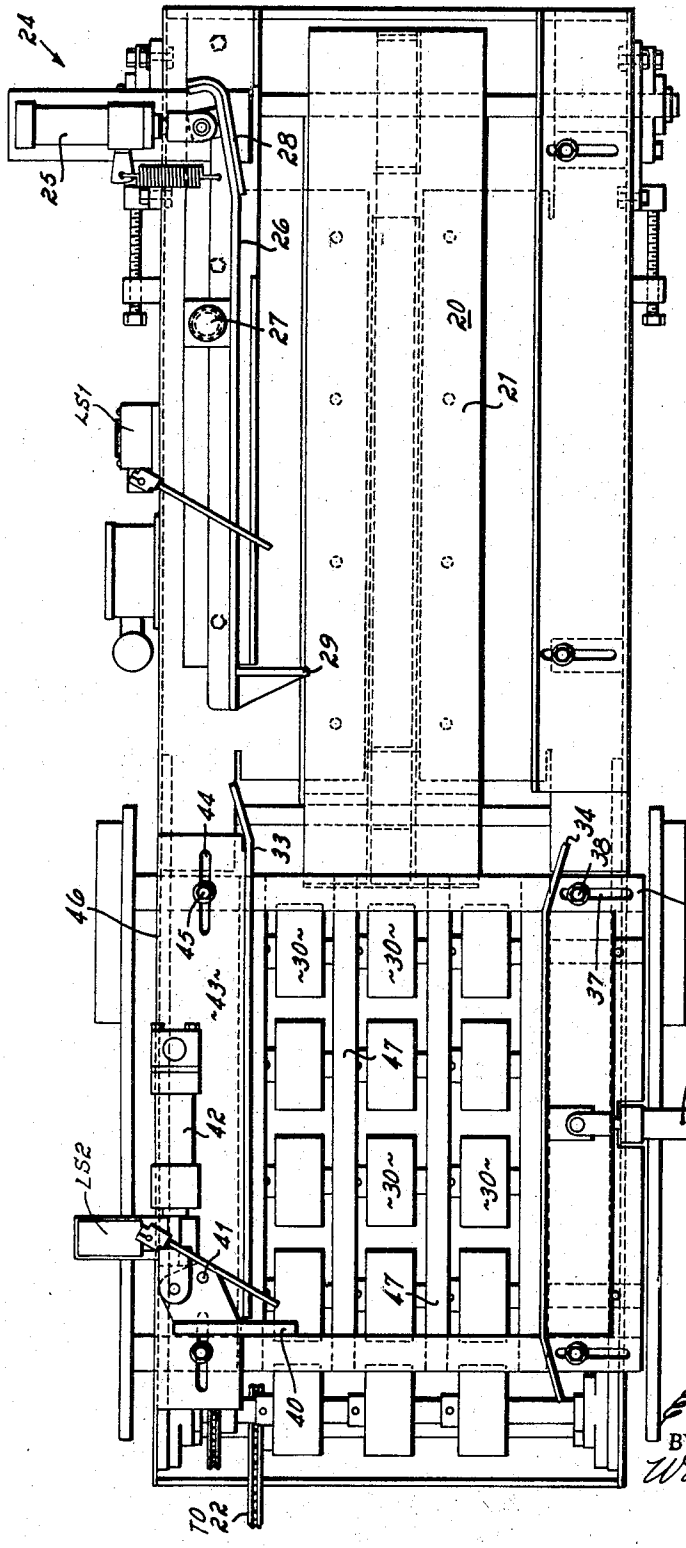

Fig. 12

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CASE LOADER

Filed Oct. 24, 1963 13 Sheets-Sheet 12

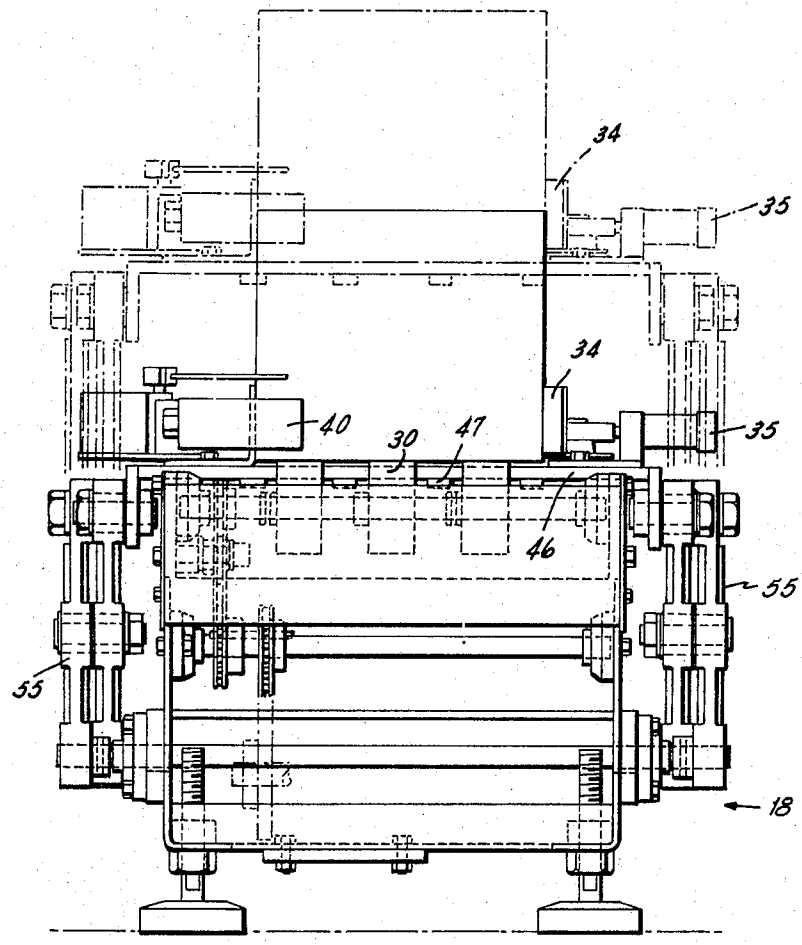

Fig. 13

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Nov. 21, 1967 E. F. ROWEKAMP 3,353,331

CASE LOADER

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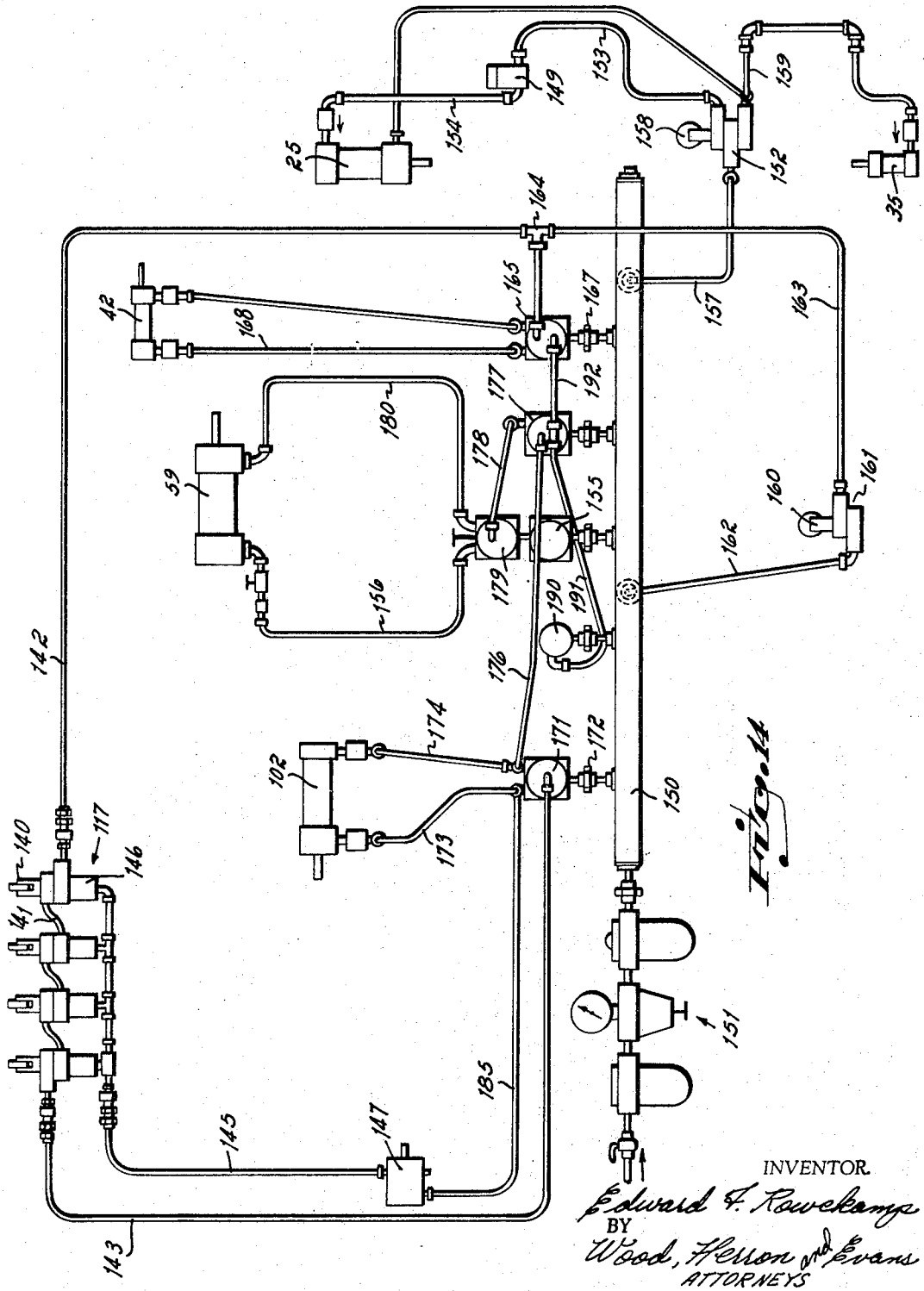

Fig. 14

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United States Patent Office

3,353,331

Patented Nov. 21, 1967

3,353,331

CASE LOADER

Edward F. Rowekamp, Cincinnati, Ohio, assignor to Lodge and Shipley Company, Cincinnati, Ohio, a corporation of Ohio

Filed Oct. 24, 1963, Ser. No. 318,577

5 Claims. (Cl. 53—166)

This invention relates to apparatus for automatically loading containers such as bottles and cans into cases.

It is common practice in the bottling industry, for example, to provide, at the end of a production line, case loading apparatus which receives bottles which have been filled, capped and labeled and are ready to be introduced into a case. The apparatus normally includes a conveyor which carries the bottles to the case loading point and which aligns the bottles into long files and transverse rows. Further, it is common practice to provide, at the loading point, a mechanism for grouping the bottles into a predetermined pattern and thereafter causing the bottles to drop into case. When the bottles are dropped into the case, it is necessary to hold back the bottles coming in from the conveyor and to relieve the pressure of those incoming bottles, which are continuously being urged to the loading point by the conveyor, from the bottles being dropped into the cases.

There are several known case loaders in use which effect the removal of the bottles from the conveyor and cause the bottles to drop into the cases. These case loaders are characterized by the provision of means for grouping the bottle into a pattern and for sliding all bottles in the pattern a distance approximately equal to one-half the diameter of the bottles. This sliding movement carries the bottles from supporting rails to a position permitting them to drop into a case. Many of these known case leaders incorporate a frame which is disposed over the tops of the bottles and which has shiftable guides depending from the frame, the guides engaging the sides of the bottles and moving the bottles transversely to the flow of the bottles from the accumulator.

The prior case loaders are subject to several disadvantages. The shift of all bottles of the pattern is an undesirable handling of the bottles, for every time the bottles are handled there exists the possibility of breakage or the like. Further, the overhead shifting apparatus blocks easy manipulation of the bottles in the pattern and in the event that a bottle should break, fall over or the like, as it is being grouped into the pattern, it is difficult for an operator to remedy the condition.

In most bottling operations the bottler has more than one size bottle which is to be loaded by the case loader. It is therefore desirable to be able to change the apparatus quickly to adapt it to a bottle of a different diameter. The known case loaders all require a considerable period of time to make this changeover, some of them requiring up to five hours.

It has been an objective of the invention to provide case loading apparatus which requires the shifting of only one or perhaps two rows of bottles to stop the flow of incoming bottles from the accumulator and to effect the dropping of the bottles, which have been aligned into a pattern, into their cases. Once the bottles are formed into the desired pattern the apparatus requires no shifting of any of the bottles of the pattern, but drops all of the bottles of the pattern downwardly into their cases. The bottles which are shifted are those of the first or second row of the next succeeding group of bottles to be formed into the pattern.

It has been another objective of the invention to provide transverse bottle shifting structure which does not require any overhead framework. Through the attainment of this objective of the invention there is no structure which prevents or makes difficult the access to the bottles formed in the pattern. Further, it admits of the possibility of providing a structure which can grasp the bottles in the pattern by their necks in order to ease their descent into the case thereby permitting the loading of quite fragile bottles.

It has been still another objective of the invention to provide case loading apparatus which is easily convertible from the loading of bottles of one diameter to the loading of bottles of a different diameter. This conversion requires adjustment of known parts of the apparatus such as the accumulator and the case conveyor. The present invention, however, provides for the interchanging of the structure by which the bottles are shifted and dropped, the interchange of the structure requiring less than five minutes. The ease of the changeover is facilitated by the fact of eliminating the superstructure or overhead shifting frame in the apparatus of the prior art. To effect the changeover of that known apparatus, it is necessary to change both the superstructure and the lower structure on which the bottles rest before shifting.

These and other objectives of the invention will become more readily apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of the apparatus illustrating its condition after a case has been loaded and conveyed away and before a new case has been introduced,

FIG. 2 is a perspective view of the apparatus illustrating its condition with a case in position to receive bottles which have been formed in the desired pattern,

FIG. 3 is a perspective view of the apparatus immediately after the bottles have been dropped into the case and the case lowered for removal to another conveyor,

FIG. 4 is a top plan view of the case loading apparatus illustrating its condition after the bottles have been moved into a pattern,

FIG. 5 is a view similar to FIG. 4, illustrating the condition of the apparatus after a row of bottles has been shifted to block the flow of incoming bottles,

FIG. 6 is a front elevational view of the case loading apparatus taken in the direction of line 6—6 of FIG. 5,

FIG. 7 is a cross sectional view taken along line 7—7 of FIG. 4,

FIG. 8 is a cross sectional view taken along line 8—8 of FIG. 4,

FIG. 9 is a cross sectional view taken along line 9—9 of FIG. 5,

FIG. 10 is a top plan view of the apparatus having been converted from small diameter bottles to large diameter bottles,

FIG. 11 is a side elevational view of the case elevator,

FIG. 12 is a top plan view of the case conveyor and elevator,

FIG. 13 is an end elevational view of the case conveyor and elevator,

FIG. 14 is a diagrammatic view of the pneumatic circuit through which the operations of the apparatus are properly sequenced.

General organization

Referring to FIG. 1, apparatus shown is for handling bottles **15**. The apparatus has four principal sections. The first is the accumulator section **19**, which conveys bottles aligned in a plurality of files to a case loader section **17** at the down stream end of the accumulator. Associated with the accumulator is a case elevator section **18**, which raises and lowers the cases into and out of engagement with the case loader **17**. A conveyor section **20** conveys empty cases and indexes them into the elevator

section 18 at predetermined times in the cycle of operation.

In the operation generally, cases fed into conveyor 20 are indexed onto elevator 18. Substantially simultaneously, bottles on the accumulator 19 are fed into the case loader 17. When the desired pattern of bottles has collected in the loader 17, the elevator lifts the case into a position to receive the bottles as they are dropped from the loader. Substantially simultaneously, a row of bottles immediately adjacent the pattern of bottles is shifted transversely of the accumulator to prevent bottles from the accumulator moving into the loader and to relieve the pressure of the incoming bottles on the bottles in the pattern. When these conditions are met, the bottles are dropped from the loader into the case. The case is lowered and discharged onto another conveyor (not shown) and the cycle of operations is repeated.

Case indexing conveyor

Referring to FIGS. 1–3 the case indexing conveyor 20 is constituted by an endless belt 21 which is preferably a rubber coated belt, but may be a flat top chain, and it is powered by a motor 22, shown in FIG. 3. The conveyor has an indexing mechanism indicated at 24 which is driven by an air cylinder 25, which drives a bar 26 pivoted at 27. The bar has a clamping element 28 which holds the next succeeding case, and it has a case stop 29 which holds an empty case and then permits it to move through when the elevator 18 is clear and ready to receive a case.

In its normal position, case stop 29 projects over belt 21 to block movement of a case, and the clamping element 28 is out of the path of movement of the cases. When cylinder 25 is actuated, bar 26 is pivoted to swing case stop 29 out of the path of the incoming case, and clamping element 28 is simultaneously swung into engagement with the next case, clamping it against the opposite guide rail.

The conveyor extends into the elevator section 18, the cases being conveyed there by wheels 30 which are driven by belts 31 connected to motor 22. The conveyor wheels 30 are bounded by a pair of case guides, 33 and 34. The guide 34 is transversely movable and is operably connected to an air cylinder 35 which drives the guide 34 against a case to clamp it against the case guide 33 to prevent it from moving out of position when the elevator is operated. The guide 34 is mounted on a plate 36 which has slots 37 through which bolts 38 pass to clamp the plate in a predetermined position depending upon the case size.

The case guide 33 has a final case stop 40 which is pivoted at 41 (FIG. 12) and which is operated by an air cylinder indicated generally at 42 to pivot the final stop out of the way when the case is filled and ready to move on to a conveyor. The guide 33 and its final stop are adjustable longitudinally in order to accommodate cases of different sizes, as shown in FIG. 12 the guide 33 is fixed to a plate 43 having longitudinal slots 44. Bolts 45 adjustably clamp the plate and guide to a frame 46 on which it is mounted.

The case conveyor section 20 has two limit switches LS1 and LS2 whose functions will be discussed in detail in the description of the pneumatic system. Switch LS1 is operated when a case is in engagement with stop 29 and LS2 is operated when a case is in engagement with final stop 40.

The elevator mechanism

The elevator mechanism is shown in FIGS. 11–13. Any conventional elevator mechanism, many of which are known, can be employed, the objective being to elevate the frame 46, carrying its guides 33, 34 and a case into position below the case loader 17. The elevator frame 46 which includes longitudinally extending bars 47 disposed in the spaces between conveyor wheels 30. The frame 46 is upwardly movable and is operatively connected to the scissors connected arms 55. The ends of the arms at the right side of FIG. 11 are mounted in slotted guides 56 so that when they are moved toward the left the elevator frame 46 and the bars 47 move upwardly. The lower ends of the scissors arms are connected to a transverse rod indicated at 58 which is connected to an air cylinder 59. When the air cylinder 59 is actuated the rod is driven toward the left to drive the frame 46 upwardly to bring the case into position to receive the bottles from the loader 17.

Bottle conveyor

Referring to FIGS. 1–3 the bottle conveyor or accumulator 19 feeds bottles 15 toward the case loader 17. The conveyor 19 has a plurality of longitudinally extending guides or dividers 72 which are transversely adjustable in order to accommodate bottles of varying diameters. The bottles are carried on the conveyor by a flat-top chain conveyor 73 which is driven by a motor 74 (FIG. 3). A framework 75 is mounted above the accumulator and supported on posts 76, the posts being mounted on a shroud 77. The framework has depending straps 78 which support the dividers 72. Set screws 79 threaded in the straps provide means by which the straps and consequently the dividers 72 are moved transversely to vary the spacing. The conveyor 19 feeds bottles into the loader section 17 which constitutes the essential part of the invention.

The loader section

The shroud, in plan view, has a generally U-shaped end which is constituted by a pair of longitudinally extending legs 80 and a transverse positioning bar 81 (FIG. 4). Referring to FIG. 6 the legs 80 of the shroud have angle members 82 whose flanges 83 provide slides on either side to receive and support the grid mechanism.

The grid mechanism has a frame constituted rear plate 84, a front plate 85, and longitudinal bars 86. The ends of the plates 84 and 85 rest on the slides 83.

The positioning bar 81 provides the fixed positioning reference point from which the positioning of all other elements is measured. On the side of the bar 81, viewed in FIG. 4, the positioning bar has a stud 87 which is engaged by the rearward plate 84. The left side has a similar stud 88 from which a positioning pin 89 projects. The plate 84 has a bore 90 which receives the positioning pin 89 when the plate 84 is slid into position. Thus, the positioning bar 81 and the positioning pin 89 which it carries, determines the longitudinal and transverse positions of the case loader.

The frame constituted by the bars 84, 85, and 86 is clamped in its position against sliding longitudinally away from the conveyor 19 by holding pins 91 which are fixed to handles 92 and are threaded into bosses 93 fixed on the legs 80. Similarly, as shown in FIG. 6, the frame is clamped against the vertical movement by clamping plates 94 which are held to the frame by pins 95 which are threaded into frame bar 85 and which are rotated by handles 96. The clamping plates clamp the frame to the flanges 83 on which the frame rests.

The frame of the loader section carries a grid having a series of longitudinally extending bottle support rails 97 which are transversely movable while the bottles are held stationary to permit the bottles to drop between the rails into the case which is supported by the elevator. The support rails are mounted on slidable bars 98 and 99 which are fixed to a shifter bar 100. The bars 99 are mounted in plates 101 which have bearing holes which permit the bars to slide easily transversely. The shifter bar 100 is operatively connected to a two way air cylinder 102 which causes the shifter bar 100 and bars 98 and 99 to shift.

Spaced above the support rails are stationary guide rails 110 which are cantilevered from the plates 101. The stationary guides are fixed to two vertically spaced bars 113 which are secured in apertures in the plates 101. The stationary guides are additionally supported by two vertically spaced bars 114 shown in hidden lines which are

fixed in apertures in the end portions of the stationary guide rails. (See also FIG. 7.)

The plates **101** also carry an angle plate **116** which is used to support the bottle detector valves **117** whose function will be described below.

Referring to FIGS. 4 and 5, immediately to the rear of the stationary guide rails **110** is a bottle shifter section **120**. The shifter section comprises the bar **98** referred to above and on a rearward bar **122** which support blocks **123** to which shifter plates **124** are fixed. In addition to the shifter plate, the rearward ends of the movable bottle supports **97** are fixed to the bars **98** and **122**. The shifter plates **124** are shown in top plan view in FIG. 4 and in side elevation in FIG. 7. The plates have a support portion **125** whose upper surface is in the same plane as the support rails **97** and they have a shifter portion **126** which projects upwardly a distance to bring the upper edges in the same plane as the upper edges guide rails **110**.

The shifter section is adapted to move toward the right as viewed in FIG. 4 when a proper pattern of bottles is lined up on the grid. In shifting to the right two important functions are accomplished. First, the shifter plates with their upper portions **126** move one or two rows of bottles to the right a distance of about half the diameter of the bottles to block the flow of incoming bottles and to take the pressure off the pattern of bottles which is to be dropped into the case. Second and simulaneously, the support rails **97** are moved out from under the bottle toward the right thereby permitting the bottles to drop ino the cases.

The design of the shifter section permits the manufacturer of the case loader easily to adapt the apparatus for bottles of varying sizes. The longitudinal dimension of the upper portion **126** of the shifter plate can be varied and the terminal position of the guide rails or dividers **72**, indicated at **130**, can be varied so that the shifter plate can shift one row of bottles (when adapted to handle large diameter bottles) or can shift two rows of bottles (when adapted to handle small diameter bottles). The terminal point **130** of the guide or divider rail **72** and the location of positioning pin **89** is fixed by the manufacturer. Each shifter section including the longitudinal dimension of upper portion **126** of the shifter plates will be designed to accommodate a specific size bottle as requested by the bottler into whose production line the apparatus is to be used. The dimension of each upper portion **126** must be great enough to carry the row or two of bottles and to prevent incoming bottles from jamming between the ends of dividers **72** and the shifter plates. But it must be small enough to avoid engaging and jamming incoming bottles.

The guide rails **110** of the grid also have a length determined by the diameter of the bottles which they are to receive and cannot be too long or too short. The extremities of the guide rails **110** should fall short of the last bottle in the pattern so that the botles which are moved transversely by the shifter section will not bind on the guide rails. To assure that the bottles in the pattern have the pressure removed from them so that they are free to fall. The guide rails **110** must be long enough for the incoming bottles shifted over by the shifter section to engage ends of the guide rails rather than the bottles in the pattern.

In apparatus of this type it is of course necessary to provide means for determining that a proper pattern of bottles has been introduced into the grid before the shifter section operates to drop the bottles into the case. The detecting means admits a variety of mechanisms, one of which is illustrated in FIG. 4. The mechanism of FIG. 4 is constituted by detector valves **117** which are three-way air valves. Each valve has a bumper actuator **140**. The valves **117** are connected in series by tubes **141** and are supplied with air under pressure through a tube **142**. When all of the bumpers **140** have been pushed inwardly by the incoming bottles, then the valves permit the incoming air from tube **142** to pass through to a tube **143**. The air passing into the tube **143** signals the system, which will be described below, that a proper pattern of bottles has been formed which are ready to be dropped into the case below.

Another air line **145** is provided and is connected at **146** to the detector valves **117** to reset the plungers **140**. Air will not be supplied to the line **145** until certain conditions are met. One of the conditions is determined by an air valve **147** which is mounted on leg **80** of shroud **77** and is actuated by a bar **148** carried by the bars **98** and **122**. It is operated only when the shifter mechanism is in its rightmost position and the bottles have been dropped.

The second condition which must be met is the elevator moving down so that the bottles are out of the way when the shifter mechanism moves to the left. The manner in which these conditions are met will be described in relation with FIG. 14.

When the bottles **15** have been grouped into a proper pattern and all valves **117** have been actuated, air is applied to the side of cylinder **102** causing the cylinder to drive the shifter section toward the right, as viewed in FIG. 4. In moving to the right, the support rails are carried toward the right out from under the bottom of the bottles **15**. The bottles are prevented from being carried to the right by the support rails because of their engagement with the stationary guide rails **110**.

When the support rails **97** are shifted away from the bottom of the bottles, the bottles drop toward the case which is held in an upper position close to the loader section by the elevator. The bottles are guided into the proper compartment in the case by guide fingers **135**, which are engaged by backup springs **136**. The guide fingers are known per se and form no part of the present invention.

Simultaneously, with the shifting of the support bars **97** the shifter plates **124** are moved toward the right carrying with them one or more rows of bottles. The bottles are carried a distance approximately equal to one-half the diameter of the bottles. The transversely shifted bottles come to rest against the up-stream ends of the stationary guide rails **110** and in this position assert no pressure on the bottles of the pattern which are supported on the support rails **97**. The incoming flow of bottles is blocked from movement into the case loader by their engagement with the row of shifted bottles.

FIG. 10 is a plan view of the case loader section after it has been converted. In the case loader described in connection with FIGS. 1–9, the loader was adapted to handle bottles of a small diameter forming six files moving into the loader section. The loader of FIG. 10 is adapted to handle bottles of a larger diameter which are aligned into four files and conveyed into the case loader. The elements of the case loader of FIG. 10 are functionally identical to the elements of the case loader of FIGS. 1–9, but have different dimensions to accommodate the different size bottles. For the sake of clarity, the reference numerals applied to the elements described in the preceding figures are also applied to the elements with the letter A appended to the numerals.

The purpose of FIG. 10 is principally to show the ease with which conversion is made from operation employing one bottle diameter to operation involving bottles of a different diameter. It can be seen that the structure shown in the broken line is the structure of the conveyor and it remains unchanged, except that the dividers **72** have been transversely shifted to accommodate the new size bottles. All that has been required for the conversion of the case loader per se is the backing-off of the holding pins **91** and the loosening of the clamping plates **94**, sliding out the original loader section, inserting the new loader section, and returning the holding pins and the clamping elements to their original condition.

The pneumatic system and operation of the apparatus

Referring to FIG. 14 a main line **150** brings incoming air under high pressure through a conventional filter and regulating system indicated at **151**. For the purpose of this description, let it be assumed that the elevator is down and empty and bottles are coming into the loader section to form a pattern. An incoming case engaging stop **29** operates a limit switch LS1 which energizes solenoid valve **149**. Upon the operation of valve **149** air is admitted through line **159**, and "elevator down" valve **152**, line **153**, valve **149**, and line **154** to the case index air cylinder **25**. This causes the indexing bar **26** to pivot thereby clamping the next succeeding case before it engages stop **29** and bringing the case stop **29** out of the way to permit the incoming case to move onto the elevator.

As the case passes limit switch LS2 which is normally open, a solenoid valve **155** is actuated. When valve **155** is actuated air passes through line **156** to the elevator lift cylinder **59** starting the elevator to move up. As the elevator moves up it rides off of a plunger **158** on the elevator valve **152** to shift the position of that valve taking the air off of line **153** and directing it onto a line **159** which drives the case clamp cylinder **35** thereby fixing the position of the case on the elevator. In taking the air off line **153**, case index cylinder is permitted to return to its normal position thereby pivoting bar **26** to release an incoming case and to swing stop **29** into the path of that incoming case. When the elevator moves to its uppermost position in the position for the case which it carries to receive the bottles, it depresses a plunger **160** on an "elevator up" valve **161**. The actuation of valve **161** admits air from line **150** through line **162** to line **163**. The air in line **163** comes off of a T **164** and into a double pilot valve **165**. The air into the pilot valve **165** from T **164** causes the valve to shift and air comes from the connection **167** through line **168** to operate the final case stop cylinder **42** thereby swinging the final case stop **40** out of the way. This conditions the apparatus for the immediate removal of the case when the case on the elevator has been filled.

The air in the line **163** also passes through the line **142** to the bottle detector valves **117**. When all of the bottle detector valve plungers have been depressed thereby determining that a proper pattern of bottles is in the grid, the air will flow through the line **142** through the line **143** to a four-way single pilot operated valve **171**. Air from the line **150** passes through a connection **172** to the valve **171**. In the valve's normal condition, the air is in line **173** which holds the shifting section of the grid in its normal position permitting bottles to pass into the grid. When the air is supplied to the pilot valve through the line **143**, the pilot valve shifts the air from the line **173** to line **174** thereby actuating the shifting section of the grid through the operation of cylinder **102** causing the bottles to drop into the case.

The air to the line **174** which causes the bottles to drop also is directed through line **176** to a three-way double pilot valve **177**. The actuation of valve **177** admits air to line **178** which actuates a single pilot valve **179**. The operation of the single pilot valve **179** shifts the air from line **156** to line **180** and reverses the position of the elevator lift cylinder **59** to cause the elevator to move down.

The valve **179** is provided with a timing head which prevents its actuation when air comes through line **178** until there is assurance that the bottles are either dropping into the case or are already in the case. This prevents the elevator from starting its downward movement until the bottles are moving into the case.

When the elevator does go down, the "elevator up" valve **161** is returned to its normal position thereby taking the air off of the lines **163** and **142**. When the air is off of line **142**, it is off of the pilot valve **171** thereby causing the air from the line **150** to shift from line **174** to line **173**. At this instant, the bottle shift section of the grid is in engagement with the valve **147**, that is, it is in its rightmost position as viewed in FIG. 4. The actuation of the valve forms apassage through line **185** and lines **145** to the reset members **146** of the valves **117**. Before sufficient air pressure has developed in line **173** to actuate cylinder **102** to return the shifting section of the grid, the air through the line **185** will operate the reset section of the valves **117** causing them to return to their normal position.

When the elevator is all the way down, the plunger **158** on "elevator down" valve **152** is depressed and the air is taken off of the case clamp cylinder **135** whereupon the filled case is free to move onto the adjacent conveyor. The actuation of valve **152** admits air to line **153**. Since a case is against a stop **29**, the limit switch LS1 is in an operated condition and air is admitted to line **154** to actuate the case index mechanism to send another case into the elevator.

When a filled case rides off the elevator, limit switch LS2 returns to its normally open position and actuates solenoid valve **190**. The actuation of valve **190** admits air to line **191** which drives valve **177** back to its original position taking air off of line **178** and permits valve **179** to return to its position permitting air to pass through line **156**. Simultaneously, limit switch LS2 closes solenoid operated valve **155** so that no air can pass to the valve **179**.

The air through line **191** passes through the line **192** and shifts valve **165** back to its original position to close the case stop **40** on the elevator through the actuation of the case stop cylinder **42**. The case coming into the elevator operates switch LS2 and then engages stop **40**. Closing of switch LS2 operates valve **155** and the cycle of operations begins again.

I claim:

1. In apparatus having a case loader, a conveyor feeding aligned containers into said loader and means supporting a case under said loader, said case loader structure comprising,

a plurality of longitudinally extending transversely spaced support rails located above said case support and in position to receive containers from said conveyor,

means for shifting said rails transversely,

longitudinally extending stationary guide rails disposed between said support rails and above the plane of the upper edges of said support rails to block transverse movement of containers supported on said support rails,

shifter plates disposed between said support rails adjacent the upstream ends of said stationary rails and projecting above the plane of the upper surfaces of said support rails,

said shifter plates being adapted to engage and transversely shift at least one row of containers,

means fixing said shifter plates with respect to said support rails whereby said shifter plates are transversely shifted with said support rails.

2. In apparatus having a case loader, a conveyor feeding aligned containers into said loader and means supporting a case under said loader, said case loader structure comprising,

a plurality of longitudinally extending transversely spaced support rails located above said case support and in position to receive containers from said conveyor and align them in a predetermined pattern,

means for shifting said rails transversely,

longitudinally extending stationary guide rails disposed between said support rails and above the plane of the upper edges of said support rails to block transverse movement of containers supported on said support rails, said guide rails having upstream ends terminating a short distance within the upstream extremity of said predetermined pattern of containers,

shifter plates disposed between said support rails adjacent the upstream ends of said stationary rails and projecting above the plane of the upper surfaces of said support rails,

said shifter plates being adapted to engage and transversely shift at least one row of containers,

means fixing said shifter plates with respect to said support rails whereby said shifter plates are transversely shifted with said support rails to carry at least one row of containers to a transversely shifted position of engagement with the upstream ends of said stationary guide rails.

3. In apparatus having a case loader, a conveyor feeding aligned containers into said loader and means supporting a case under said loader, said case loader structure comprising,

a plurality of longitudinally extending transversely spaced support rails located above said case support and in position to receive containers from said conveyor,

means for shifting said rails transversely,

longitudinally extending stationary guide rails disposed between said support rails and above the plane of the upper edges of said support rails to block transverse movement of containers supported on said support rails,

shifter plates disposed between said rails adjacent the upstream ends of said stationary rails and projecting above the plane of the upper surfaces of said rails,

said shifter plates being adapted to engage and transversely shift at least one row of containers,

means fixing said shifter plates with respect to said rails whereby said shifter plates are transversely shifted with said rails to carry at least one row of containers to a transversely shifted position of engagement with the upstream ends of said stationary guide rails.

4. In apparatus having a case loader, a conveyor, feeding aligned generally cylindrical containers into said loader, said conveyor having longitudinally extending dividers having downstream ends terminating adjacent said loader, and means supporting a case under said loader, said case loader structure comprising,

a plurality of longitudinally extending transversely spaced support rails located above said case support and in position to receive containers from said conveyor,

means for shifting said rails transversely,

longitudinally extending stationary guide rails disposed between said support rails and above the plane of the upper edges of said support rails to block transverse movement of containers supported on said support rails,

shifter plates disposed between said support rails adjacent the upstream ends of said stationary rails and projecting above the plane of the upper surfaces of said support rails,

the upwardly projecting portions of said shifter plates being normally spaced from the ends of dividers and from the ends of said stationary rails a distance less than the radius of a container,

said shifter plates being adapted to engage and transversely shift at least one row of containers,

means fixing said shifter plates with respect to said support rails whereby said shifter plates are transversely shifted with said support rails.

5. In apparatus having a conveyor for feeding aligned containers, supporting means at the discharge end of said conveyor, a case loader comprising,

a frame,

means for removably securing said frame on said supporting means,

a plurality of longitudinally extending transversely spaced support rails and shiftably mounted on said frame normally in position to receive containers from said conveyor,

longitudinally extending stationary guide rails disposed between said support rails and above the plane of the upper edges of said support rails to block transverse movement of containers supported on said support rails

shifter plates disposed between said support rails adjacent the upstream ends of said stationary rails and projecting above the plane of the upper surfaces of said support rails,

said shifter plates being adapted to engage and transversely shift at least one row of containers,

means fixing said shifter plates with respect to said support rails whereby said shifter plates are transversely shifted with said support rails.

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