United States Patent

[11] **3,570,693**

[72] Inventor **John J. Peyton**
Santa Barbara, Calif.

[21] Appl. No. **817,465**
[22] Filed **Apr. 18, 1969**
[45] Patented **Mar. 16, 1971**
[73] Assignee **Industrial Automation Corporation**
Santa Barbara, Calif.

[54] **CASE UNLOADING MACHINE**
14 Claims, 20 Drawing Figs.

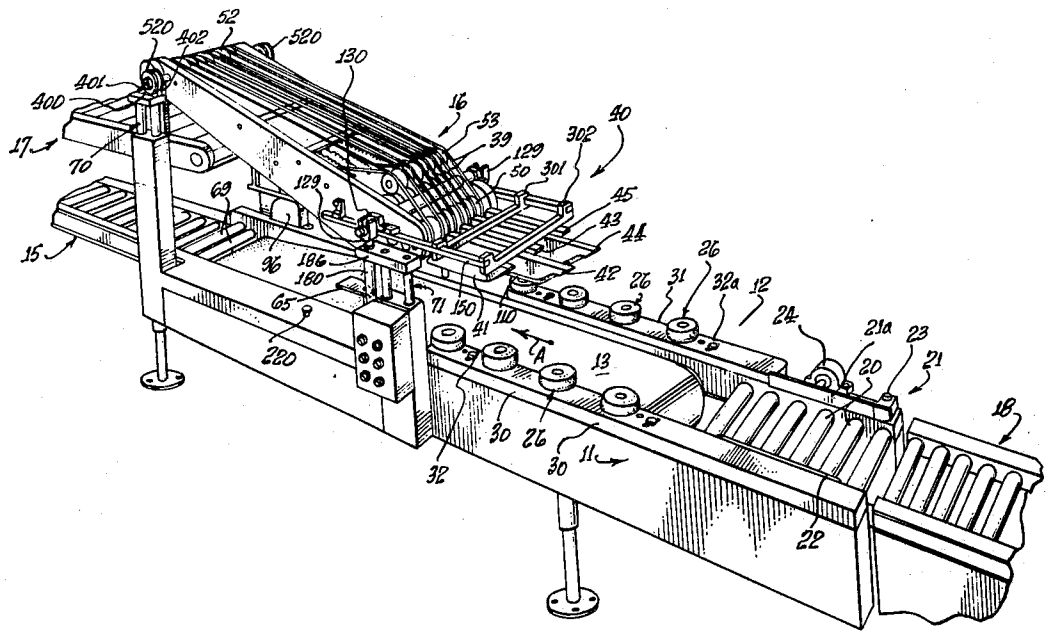
[52] **U.S. Cl.** **214/309,**
198/165
[51] **Int. Cl.** **B65b 21/18**
[50] **Field of Search** 214/309;
198/20, 117, 126, 179

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Primary Examiner—Gerald M. Forlenza
Assistant Examiner—George F. Abraham
Attorney—Spensley, Horn and Lubitz

ABSTRACT: An automatic bottle from case unloading machine employing a plowlike member which directs the bottles within a case passing under the plow to be directed into predetermined paths coincident with the pluralities of belt pairs which serve to grip and remove the bottles from the cases. The cases are driven on a conveyor belt beneath a head which includes the plow and belt pairs. A synchronized head lifting construction permits rapid clearing in the event of a jam and also enables quick belt change when a belt breaks.



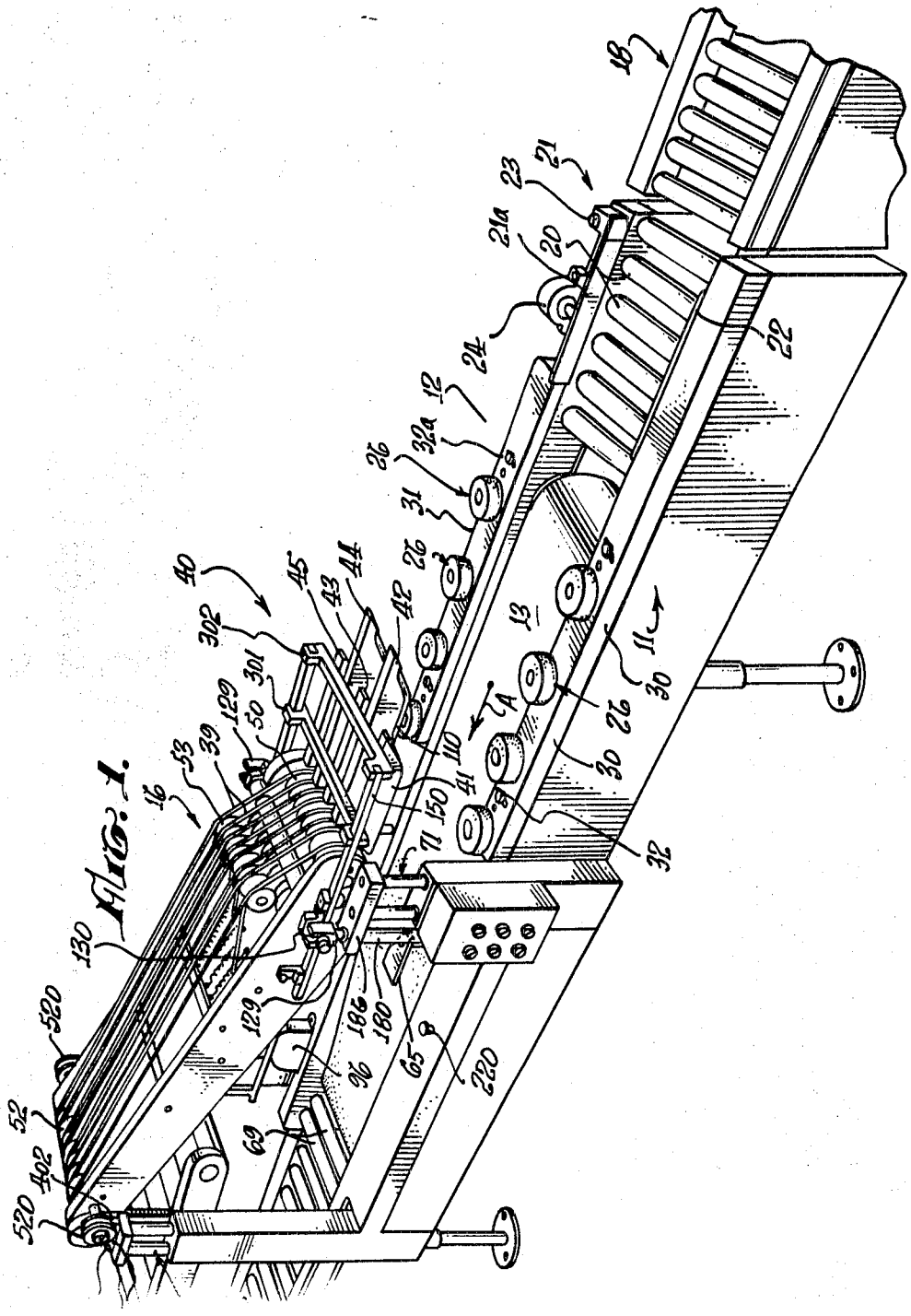
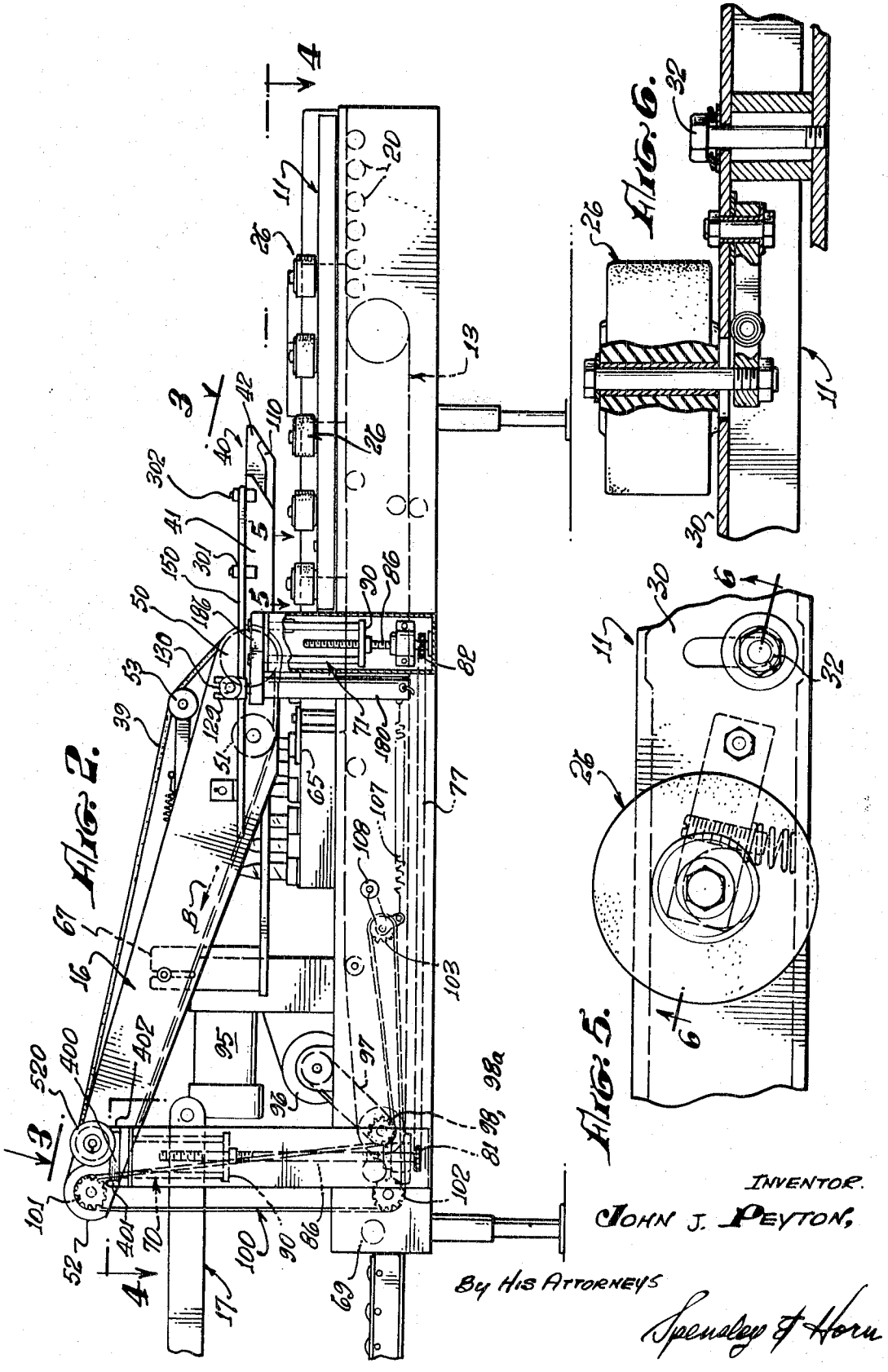

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FIG. 1.

PATENTED MAR 16 1971

3,570,693

SHEET 2 OF 8



PATENTED MAR 16 1971

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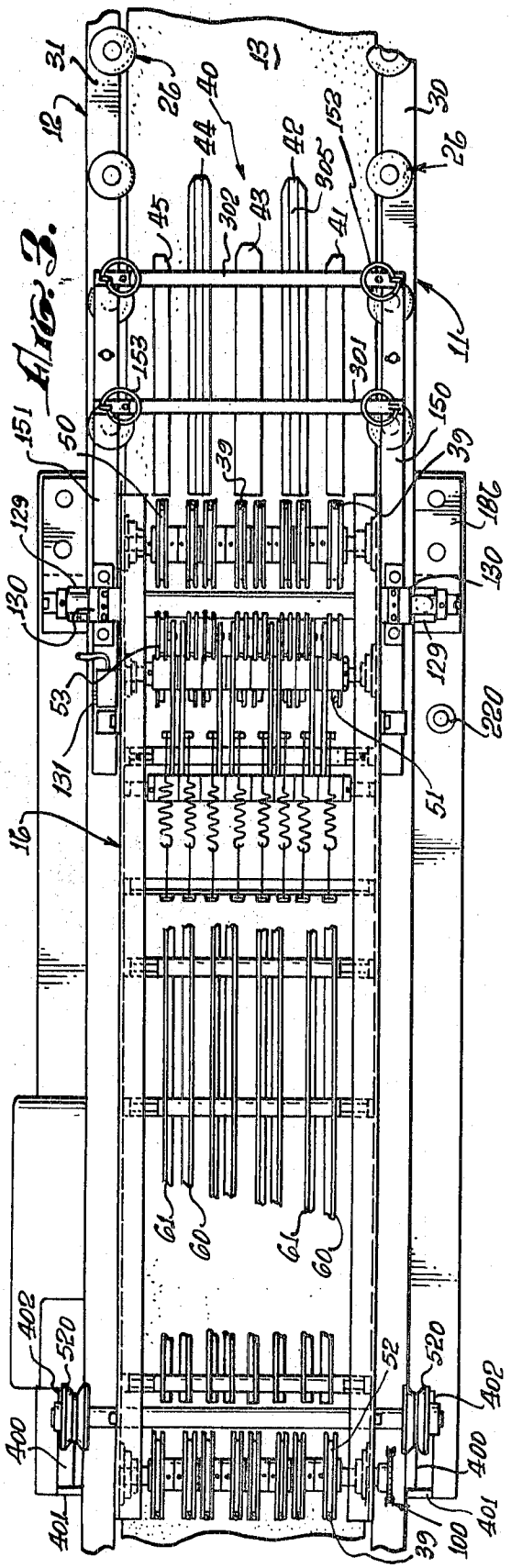


Fig. 3.

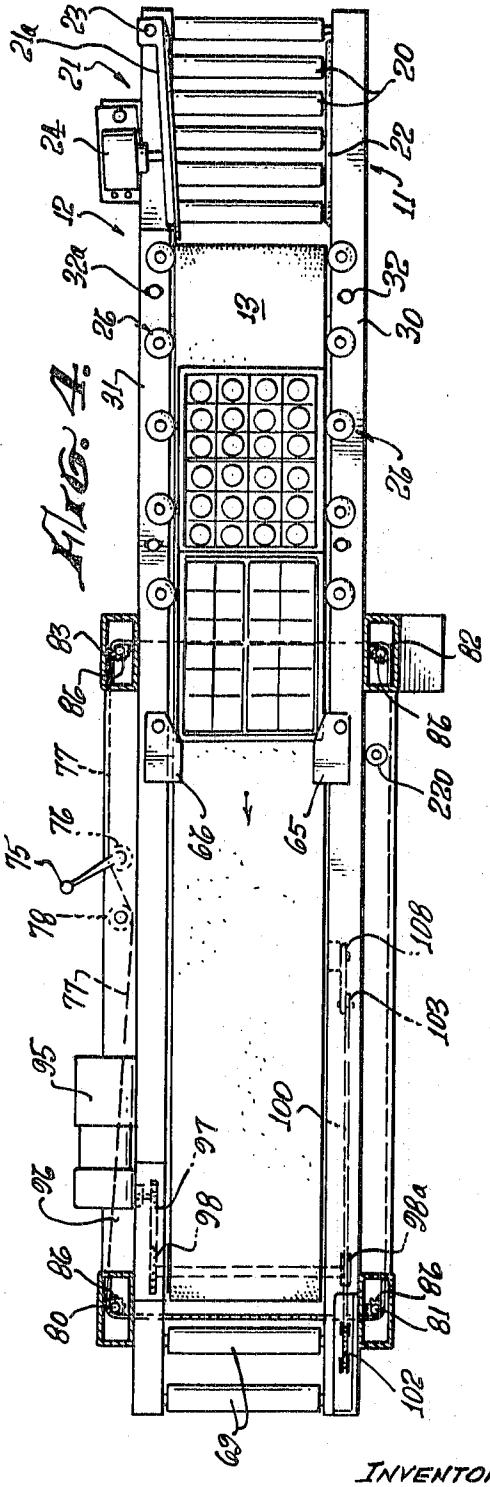


Fig. 4.

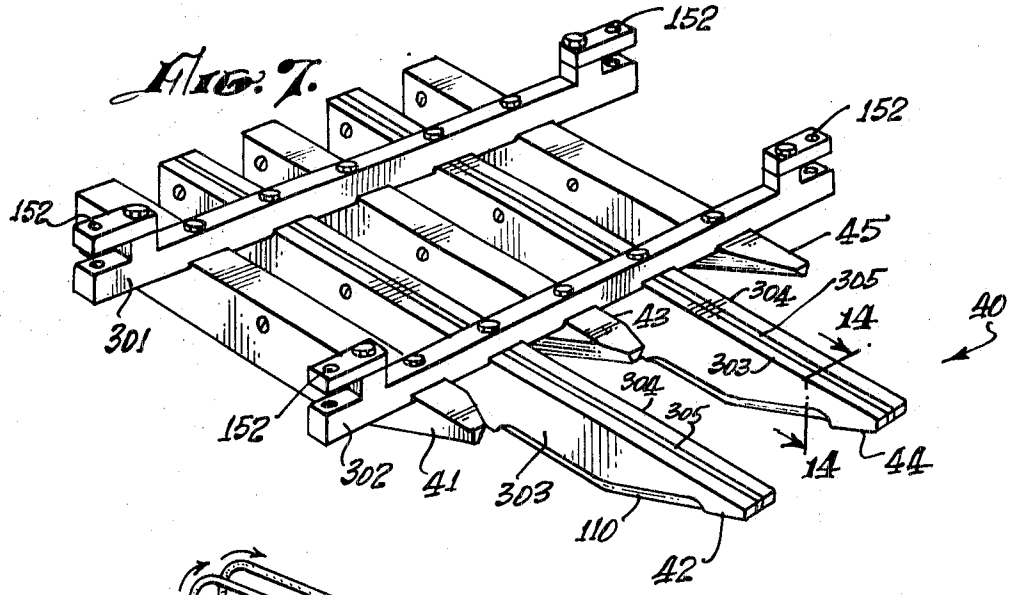
INVENTOR.

JOHN J. PEYTON,

By His Attorneys

Spensley & Horn

FIG. 7.



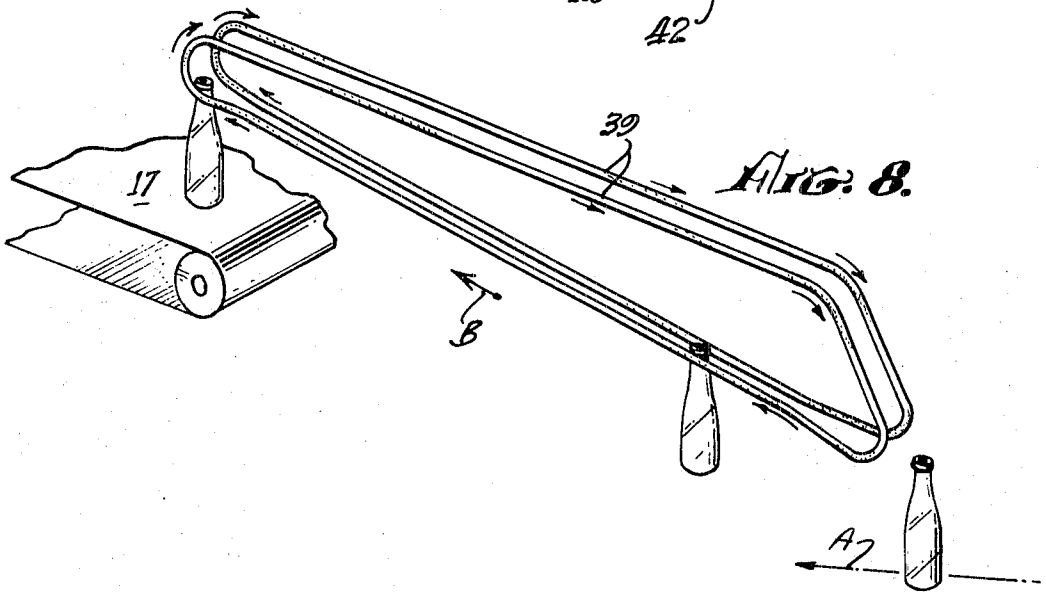
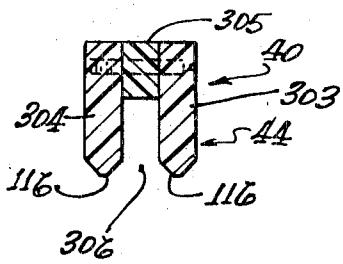


FIG. 8.

FIG. 14.



INVENTOR
JOHN J. PEYTON,

By His Attorneys

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FIG. 9.

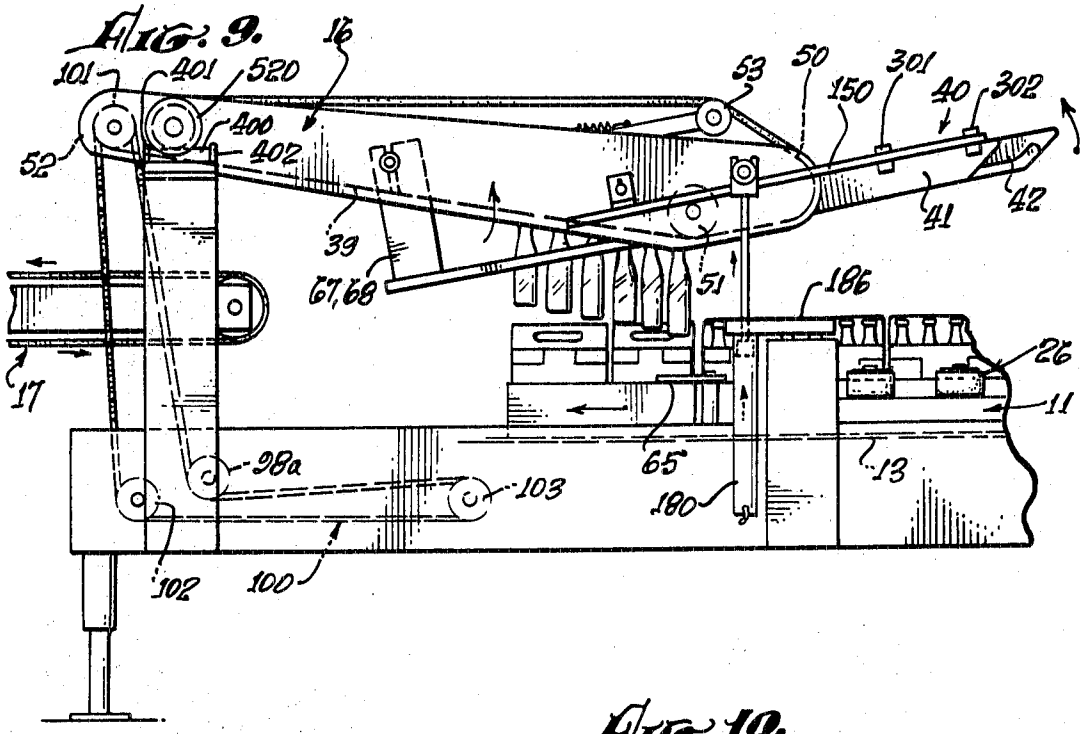
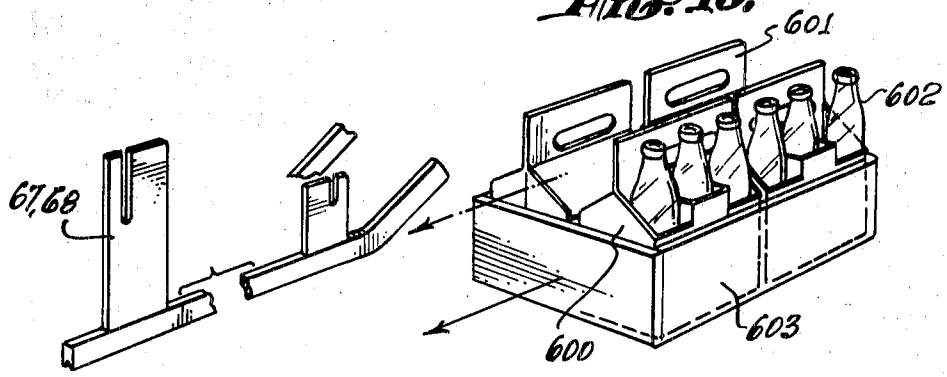


FIG. 10.



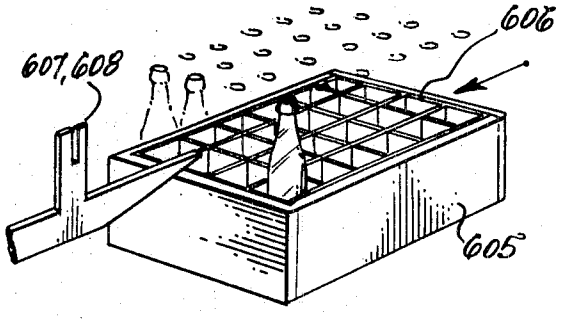


FIG. 11.

INVENTOR.

JOHN J. PEYTON,

By His Attorneys

Spencer & Horn

FIG. 12.

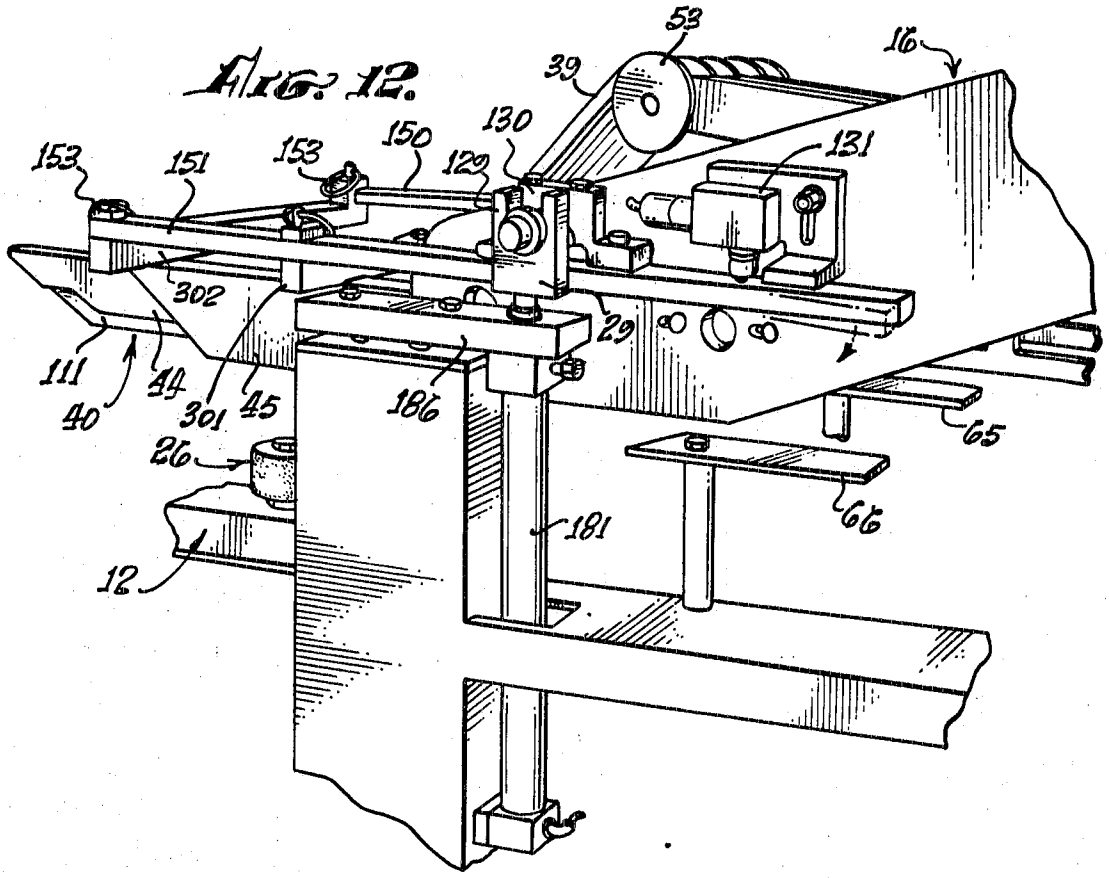
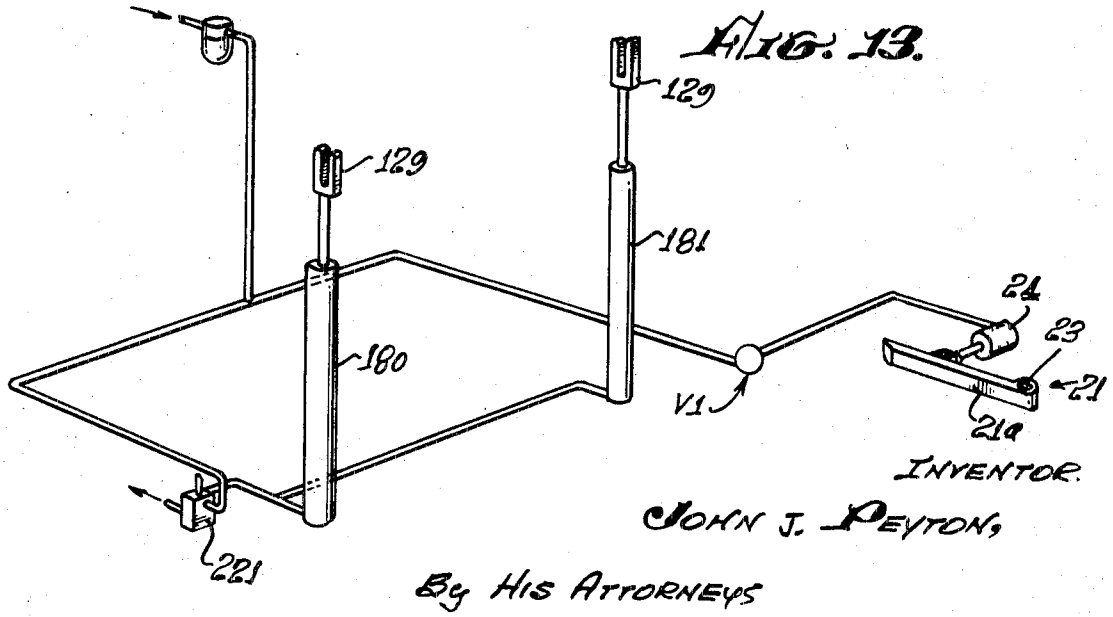
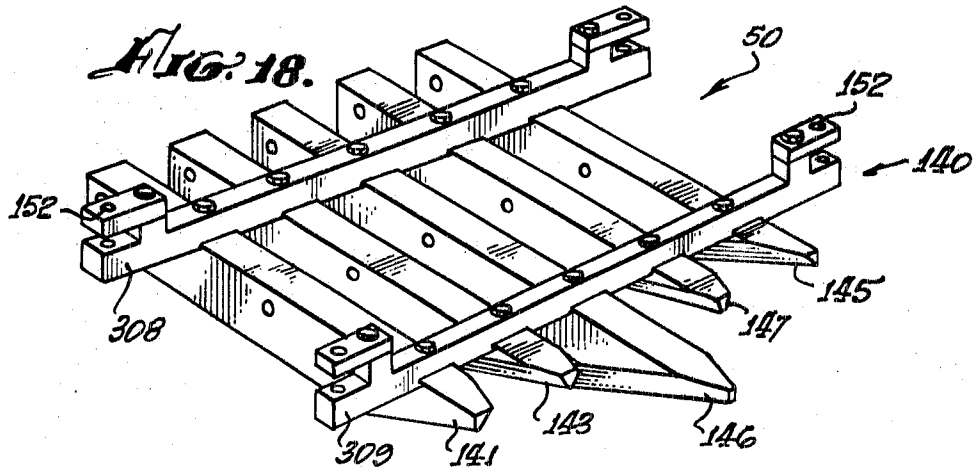


FIG. 13.



INVENTOR.
JOHN J. PEYTON,
By His Attorneys
Spensley & Horn.

FIG. 18.



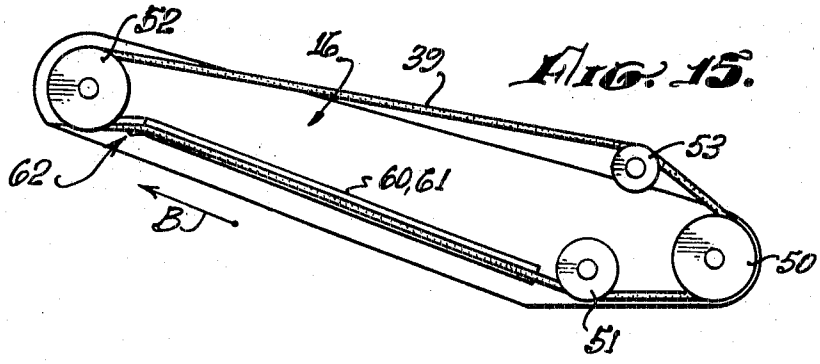
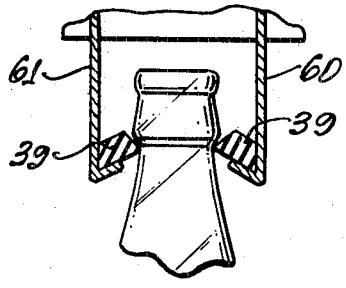
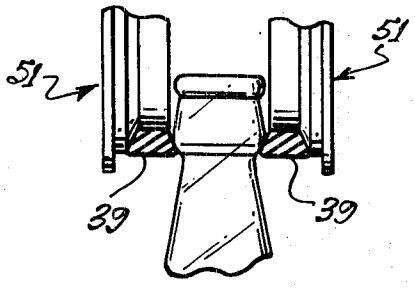


FIG. 15.

FIG. 16.

FIG. 17.





INVENTOR.
JOHN J. PEYTON,

By His Attorneys.

Spensley & Horn.

FIG. 20.

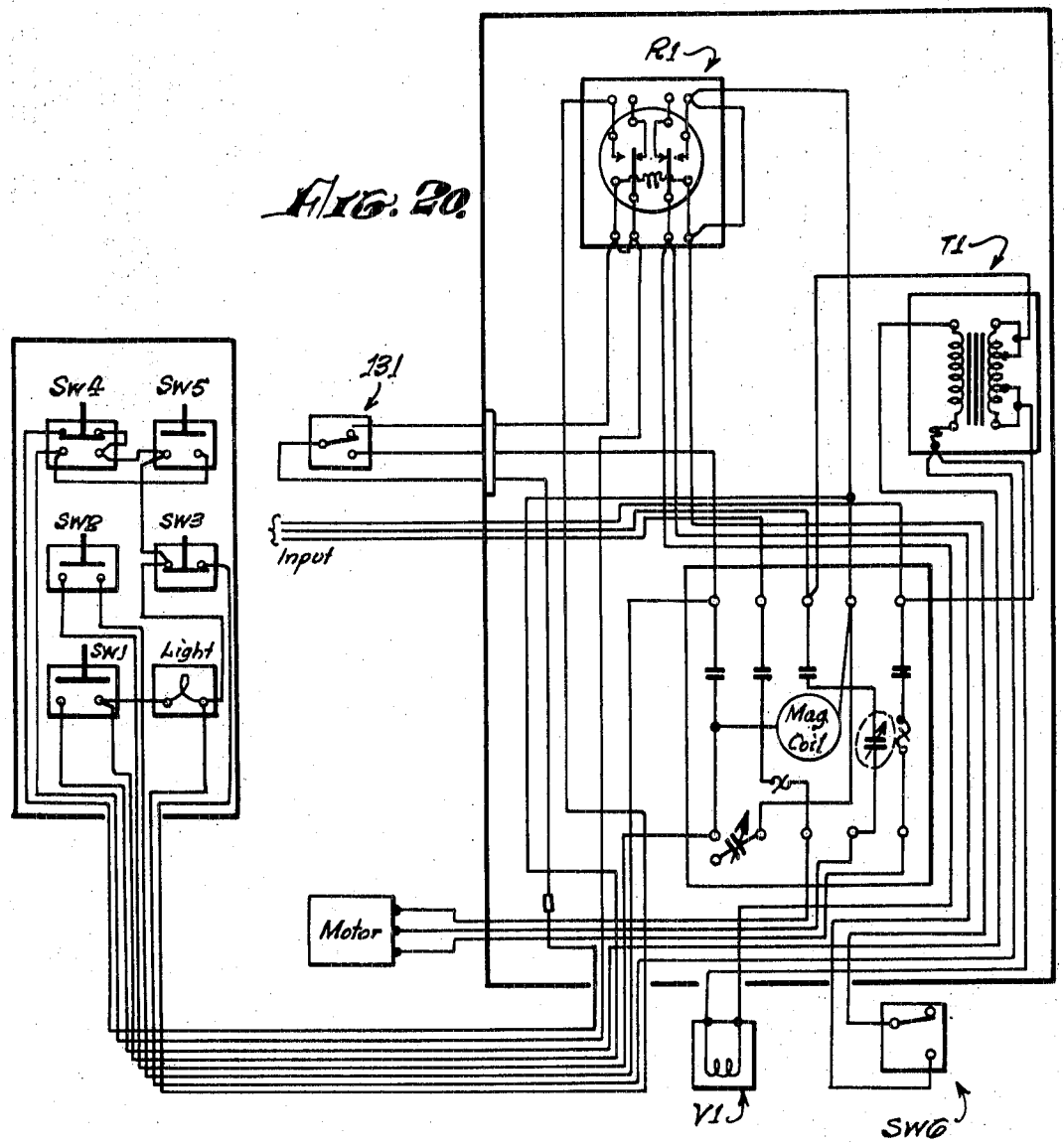
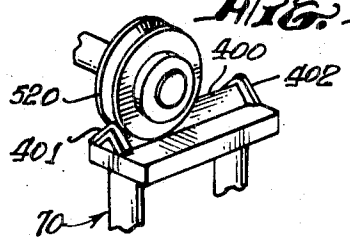


FIG. 19.



INVENTOR.

JOHN J. PEYTON,

By His Attorneys.

Spensley & Horn.

CASE UNLOADING MACHINE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a machine to automatically remove bottles from a case. Such machines typically receive a line of empty bottles standing upright in cases, which cases are transported to the machine by a conventional conveyor belt. The bottles are automatically removed from the cases by a "head" and the cases are permitted to pass under the head on a continuation of the conveyor which serves as an input to the machine. A second exit conveyor receives the bottles and transports them away.

2. Description of the Prior Art

Machines for uncasing bottles from cases have been known in the art. One such machine is described and claimed in U.S. Pat. No. 2,758,731 entitled "Case Unloader" by A. C. Davis issued Aug. 14, 1956. The prior art machines have many shortcomings. Among them are the following. There is extreme difficulty and, therefore, production line down time which occurs whenever it is necessary to change belts in the head. Additionally, if a jamming should occur with the head, it is difficult and time consuming to clear the jammed case or bottles or bottle or bottle carton. Means for aligning the bottles within the case known as plows are required for different sizes and types of bottles and the means for changing such plows or its equivalent in the present art machines is rather complex and time consuming. No means are provided in the present art machines for centering varying width cases as they are infed to the head. Additionally, if a jamming should occur in the vicinity of the head, no means are provided for discontinuing the flow of cases to the head other than an entire turning off of the machine requiring the constant presence of an operator.

All of the above disadvantages in the present art machines have been overcome by the present invention.

It is, therefore, an object of the present invention to provide a new and improved automatic uncasing machine which minimizes or eliminates the presence of an attendant and increases production line efficiency by reducing down time.

SUMMARY OF THE INVENTION

The present invention is for an apparatus to automatically unload bottles from a case or compartment. The present invention machine provides for ready adjustment of the head or bottle gripping means to accommodate bottles of different sizes. The machine also provides for automatic turn off in case of jamming and is so constructed and arranged as to permit quick removal of the head so as to permit a rapid changing of the belt pairs which grip the bottles. A quick release plow assembly is mounted in the front of the leading end of the head to align the bottles prior to their being fed into the head for gripping and removal from the cases which pass therebelow. The present invention machine is constructed so as to always have the bottles and cases deposited in a substantially vertical position thus minimizing the difficulties which might otherwise be attendant in the machine jamming or otherwise being stopped during a run.

Another object of the present invention is to provide an uncasing machine which provides means for pneumatically raising the head for clearing any jamming which may occur.

A further object of the present machine is to provide a design whereby the entire head may be quickly lifted off of the machine to permit easy and rapid belt change.

A still further object of the present invention is to permit changing to a different head for accommodating different bottle spacing.

A further object of the present invention is to provide for automatic turn off of the machine if jamming should occur.

Yet a further object of the invention is to provide for automatic centering of the cases as they enter the head portion of the machine.

The novel features which are believed to be characteristic of the invention, both as to its organization and method of operation, together with further objects and advantages thereof will be better understood from the following description considered in connection with the accompanying drawings in which some preferred embodiments of the invention are illustrated by way of example. It is to be expressly understood, however, that the drawings are for the purpose of illustration and description only, and are not intended as a definition of the limits of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the presently preferred embodiment of this invention;

FIG. 2 is a side elevation, partly in section, of the machine shown in FIG. 1;

FIG. 3 is a view taken along lines 3–3 of FIG. 2;

FIG. 4 is a view taken along lines 4–4 of FIG. 2;

FIG. 5 is an enlarged view, partly in section, taken along lines 5–5 of FIG. 2;

FIG. 6 is a view taken along lines 6–6 of FIG. 5; FIG. 7 is an enlarged perspective view of one type of plow assembly employed with the present invention machine;

FIG. 8 is a schematic view showing the manner in which a single bottle is picked up from a case containing a plurality of bottles as the case passes under the head;

FIG. 9 is a partial side view of the present invention machine showing the head in the lifted position to permit clearing of the head;

FIG. 10 is an exploded perspective view showing how the carton stripper of FIG. 9 operates to retain hand-carried cartons within a case which includes bottles to be removed therefrom;

FIG. 11 is a view similar to FIG. 10 for showing bottles within a case not housed in hand-carried cartons, but which case may have removable partitions;

FIG. 12 is an enlarged partial perspective view of the machine in the vicinity of the plow assembly to show how it is connected to the head;

FIG. 13 is a schematic diagram of the pneumatic system associated with the present invention machine;

FIG. 14 is an enlarged section view taken along line 14–14 of FIG. 7;

FIG. 15 is a schematic view showing how a belt pair is arranged to remove bottles from a case;

FIG. 16 is en enlarged view showing how the belt pairs grip a bottle in order to remove it from the case;

FIG. 17 is a cross section of a pair of belt pairs and associated metal guides illustrating how the belt pairs slide in the guides as they are lifting the bottles from the case;

FIG. 18 is a perspective view of another embodiment of a plow assembly employed in connection with the present invention machine;

FIG. 19 is an enlarged perspective view showing how the exit portion of the present invention head is supported; and

FIG. 20 is a schematic circuit diagram of the electrical control circuit associated with the present invention machine.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the FIGS., there is shown in FIG. 9 a line of half depth cases. The cases are typically made of wood, but they may be made of plastic or even cardboard. The cases are transported in on a conveyor 18 (see FIG. 1) external to the present invention apparatus which abuts against the same. The cases are fed along over the rollers 20 supported between two channel members which are numbered 11 and 12. The cases are fed by a motor drive conveyor 13 which forms a part of the present invention machine or apparatus through the rear end of the machine and on to an external and separate conveyor 15 which may or may not be driven. Conveyor 13 is a belt conveyor driven by a motor means not shown in FIG. 1 which will be hereinafter described.

The bottles are removed from the cases by the "head" generally numbered as 16 and the bottles removed from the cases are deposited upon being removed to a second higher conveyor 17 separate from the machine numbered 16. Bottle conveyor 17 is an externally driven bottle conveyor. The cases come in toward the present invention machine (in the direction of arrow A) on conveyor 18 which is external. They enter the machine on full rollers which are not driven (these rollers are numbered 20). The cases enter between the case stop assembly 21 which consists of a phenolic member 21*a* which is hinged at 23 and can be forced inward by the air cylinder 24. A second fixed phenolic member 22 is mounted on the opposite side of rollers 20 as is shown in FIG. 1. Upon actuation of the air cylinder 24, phenolic member 21*a* is forced inwardly and exerts a pressure on the case which is then over rollers at the entrance end of the machine thus withholding all of the cases behind the one case thus held between movable phenolic member 21*a* and fixed phenolic member 22. The air cylinder 24 is actuated whenever it is desired to stop the flow of cases in order to either discontinue a run in which case it is done manually or by external control switches or it is automatically actuated in a manner hereinafter to be explained if a jamming occurs in the vicinity of the head 16.

As the cases leave the rollers 20, they go on to belt 13 which is a rubber gripped belt driven by the main uncaser motor and this provides the power to direct the cases on through the machine in the direction of arrow A. As the cases go on to belt 13 they go between spring loaded rubber rollers 26. The rollers are individually spring loaded to center the cases and each group of rollers can be moved in or out to accommodate a wide variation of cases. This is accomplished by means of the adjustment of the channel members 30 and 31 through the combination of the bolts 32 and slots 32*a* by means of which these channel members are positioned on the machines. This major adjustment allows any desired amount of preload of the centering rollers 26. The individual spring loading of the rollers 26 will allow cases to be centered regardless of varying width of the cases to an extent so that they will always enter the plows and the uncasing head centered. As the cases proceed further along belt 13, the bottles will enter the plow assembly whose primary purpose is to, in the case of cartoned bottles, align the bottles so they enter between the belts and align the carton handles in line outside of the line of the bottles so the carton handles will miss the belts and pass between the pulleys which carry the belt pairs. This is best shown in FIGS. 8 and 16 wherein a belt pair designated by the numeral 39 is schematically shown to indicate how a bottle is picked up and then released as it passes underneath the head 16. The belt pairs are driven over pulleys 50, 51, 52 and 53 as is shown in FIG. 15. Guides 60, 61 determine the spacing between the belt pairs whereby they are caused to come in contact with the necks of the bottles and then toward the rearward portion of the belt pairs as the bottles passes over the exit bottle conveyor 17. The guides 60, 61 assume a substantially horizontal position and divide the belt pairs to a spacing so that there is no longer a gripping action on the bottle neck and the bottles are thus released in a vertical position and are conveyed away from the head 16. Note that in the vicinity of pulley 52 as the belt pairs 39 approach the same, that they assume a substantially horizontal position. This is caused by the shape of the guides 60, 61 which are associated with each belt pair, thus assuring that the bottles will exit in a substantially upright position over the conveyor 17.

In normal operation, the head is in the position as shown in FIG. 1. The plow 40 which is generally designated by the numeral 40 is best shown in perspective in FIG. 7. This plow 40 is employed for bottles disposed in cartons whose handles are at the height of or exceed the gripping section of the bottles (see FIG. 10) as opposed to other bottles (see FIG. 11). The high carton plow 40 consists of five horizontal members numbered 41, 42, 43, 44 and 45. Members 41, 43 and 45 are shorter than are members 42 and 44.

This plow assembly 40 is used primarily for bottles which are returning in 6-pack or 8-pack carriers with high carton handles, the cartons 600 being shown in FIG. 10 as having their handles 601 extend above the neck of the bottle where they are to be gripped indicated by numeral 602. The purpose of the plow members 42 and 44 is to align the carton handles 601 so they will pass between the pulleys without being gripped with the bottle neck. As the case 603 enters the head 16, the first bottles to contact the plows will contact the plow members 42 and 44. Further explanation of the purpose and operation of the plow 40 will hereinafter be explained.

In general, the head 16 operates in the following manner. The plow assembly's purpose is to center the bottle so that they will pass between the belts. As the bottle necks leave the plow assembly and enter the first set of pulleys 50, the pulleys are far enough apart as are the belts at that point so there is no contact with the bottle neck. As the bottle passes from the first set of pulleys 50 they enter the pulleys 51. Between 50 and 51 the belts come closer together and grip the neck of the bottle. Pulleys 51 are half pulleys so that as the bottle goes between the pulleys it can be gripped by the belt pairs. As the bottle passes between the pulleys 51, the belts grip the bottle as shown in FIG. 16. As the belts leave pulleys 51 in the direction of arrow B they enter the stainless steel guides 60, 61. Thereafter the belt pairs are kept narrowed by the guides 60, 61 so that the belt pairs 39 contact the bottle neck on each side as generally shown in FIGS. 8 and 17. The belts go up the stainless steel guides and in the process lift the bottle out of the case which is still being driven by the belt 13. The speed of the belt 13 and of the belt pairs is synchronized by a main drive chain 100 to insure that the bottles will rise vertically out of the case. As they proceed toward pulleys 52 the horizontal component of the velocity of the belt pairs moving in the direction of arrow B has to equal the horizontal velocity of the cases moving along conveyor 13. This belt speed can be varied depending upon the speed of the entire bottling line. The speed of the belt pairs and that of the cases are kept in synchronization.

The bottles meet the upper end of the stainless guide belts in the vicinity of 62. The belts bend backwards and then enter a horizontal position again, so that the bottle is traveling horizontally over the bottle conveyor 17 upon which it is to be released. As the belts exit the stainless steel guides 60, 61 they are spread apart by a wider spacing of pulleys 52 (wider than pulleys 51). Approximately midway between the end of the stainless guides and pulleys 52 the belts are spread far enough that the bottle neck is released and the bottle gently set on conveyor 17. The pulleys 52 are far enough apart so that the bottle neck can pass between them.

Case hold down plates 65 and 66 as may best be seen in FIG. 4, serves to hold the cases down on conveyor 13. As the bottles are being removed from the case below the belts, the case hold downs 65 and 66 serve to prevent the case itself from being raised if a tight bottle is tending to lift the case.

Two side-by-side carton strippers 67 and 68 (which are identical) are in position between the bottles and if the carton is raised by the bottles and the carton handle will come up against 67 and slide along with the motion of the case and be prevented from rising with the bottle. The strippers 67 and 68 will thus cause the cartons to remain in the case.

The emptied cases exit over the free rolling rollers 69 forming part of the external conveyor 15.

In order to adjust for different height bottles, the entire head 16 must be raised or lowered accordingly. The manner in which this is accomplished will now be explained with reference to FIGS. 1, 2 and 4. As may be seen in FIG. 1, the head is supported at each of four corners by a pair of stainless steel post pairs numbered 70 and 71 for the back and forward pairs, respectively. The raising or lowering of the head is accomplished by the turning of crank 75 which serves to raise or lower the head in the following manner.

In FIG. 11 there is shown a typical case 605 where the bottles are divided therein by an egg carton and one or more like

removable divider assemblies 606. The strippings 607 are provided to prevent removal of 606 with the bottles.

The crank 75 drives a continuous loop chain 77 which passes over a sprocket 76 and a free wheeling idler 78 to obtain tension. The chain in turn drives four sprockets numbered 80, 81, 82 and 83. The sprockets are affixed to lifting screws, an exemplary one of which is numbered 86 in FIG. 2. The screw 86 when turned drives the stainless steel guide posts 70 and 71 up or down by means of a plate 90 upon which they rest. All four posts are raised in equal amounts by means of the chain synchronization of all four sprockets, thus the head is raised equally at all four corners.

The drive of the machine is accomplished by means of a variable speed motor 95 mounted on the frame of the machine. A torque limiter designated 96 allows the machine to slip in case of an overload or jam of bottles. A second chain 97 is driven by the torque limiter associated with the motor 95 to drive sprocket 98 which in turn drives the main roller of belt 13.

The power to drive the belt pairs is taken off the other end of the main roller belt 13 by means of sprocket 98*a*. There is a sprocket on each end of the shaft which is driven by motor 95. These sprockets are numbered 98 and 98*a* (see FIG. 4). The power drive to the head 16 is secured from sprocket 98*a* and transmitted by means of chain 100 to the head through the sprocket 101 (see FIG. 2). Sprocket 102 is a fixed idler and sprocket 103 is a spring loaded idler which is kept in tension by spring 107. The spring loaded idler 103 takes up any changes in chain length which would occur when the head is raised and lowered for different size bottles and also when the rear end of the head is raised to clear bottle jams or to entirely remove the head 16, all of which will be explained later. All chain adjustments are automatic as a result of sprocket 103 in association with spring 107, and pivot member 108.

The plow design and function will now be explained with reference primarily to FIGS. 1 and 7. In FIG. 7 there is shown a perspective view of the high carton plow which is employed to remove bottles from their cases which is called a high carton plow.

The plow 40 is constructed of 5 phenolic members, 41, 42, 43, 44 and 45, which are supported by and bolted to two steel cross members 301 and 302. Two of the phenolic members 42 and 44 are longer than are the remaining three members. Additionally, the members 42 and 44 are differently constructed from the others. Members 42 and 44 are of a sandwich construction whereby the outer walls 303 and 304 are separated from each other by a separation member 305 to define a channel or groove 306 between the walls (see FIG. 14). As the case of bottles comes in contact with the plow, the rows of bottles will first contact the plow members 42 and 44 (see FIG. 7). The slope and beveling of the front edge of these plow members as indicated at 110 and 111 will cause any bottles to be forced outwardly so long as any portion of the bottle up to its centerline comes in contact with the outside edge of the plow member; thus, it will force the bottle out between the plow members for proper entry to the belt pairs and pulleys.

The bottle hits the front slope 110 of member 42 and is forced outward by the slope and also by the bevels on the edge 116. When the carton handle hits the inner edge of the bevel edge, it is force inward into the tunnel or groove 306 which is defined by the two members 303 and 304 forming member 44.

Thus, the bottles are forced to the outside of the plow and the carton handles are forced into the center of the plow passed through the tunnel. If a bottle is misaligned completely so that it cannot be forced out by the front slope and tries to enter the tunnel, the bottle neck is wider than the tunnel and because of the front slope, will cause the plows to rise, swinging up on bearing 130.

As may best be seen in FIGS. 1, 2 and 12, the manner in which the mechanism by which the plow is caused to assume the upward position upon a bottle being in the incorrect position so as to otherwise cause a jamming of the machine is brought about in the following manner. If a bottle tries to go under one of the plow members (rather than between them) or into the tunnel, that will cause the plow to pivot on bearing 130, causing microswitch 131 to become actuated which will shut off the main drive motor 95 and also activate the case stop 24 causing the cases in line now on and behind rollers 20 to stop.

In normal operation, as the case proceeds further into the plows, the plow members 41 and 45 will cause the outer rows of bottles to be forced in line between the plow members 41, 42 and 44, 45 (as pairs) for entry into the pulleys and associated belt pairs as previously explained. Central member 43 will divide the two inner rows of bottles and align them. Any substantial misalignment of a bottle which would cause it to go under a plow member will cause the entire plow to rise because of the front slope of the members and have the same effect as before, with the switch 131. The plow assembly is long enough so that any misalignment will cause the plow assembly to swing up in sufficient time for the machine to stop completely before the bottles enter the pulley and belt area.

FIG. 18 is a perspective view for the universal plow assembly which will now be described. The plow includes phenolic members 141, 143, 147 and 145 which are all of the same length and member 146 which is longer. Steel cross members 308 and 309 are bolted to and support these plow members. Plow members 141 and 145 are identical to members 41 and 45 of the plow of FIG. 7. Plow members 143 and 147 are identical to plow member 43 of plow 40, however, they are now placed in a position as shown in FIG. 20.

Plow member 146 is in identical shape to plow member 43 (see FIG. 7), however, it is longer than member 43. There are no hollow or tunnel-type plow members in the plow 50 of FIG. 18 as there were in FIG. 7 plow. As the case of bottles enters the universal plow assembly, the first bottles are contacted by the center plow member 146. The center plow member contacts the bottles first and aligns the center row of bottles and also tends to force the bottles out slightly helping to align the outer rows of bottles and as the bottles proceed further, they are contacted by the other four plow members and aligned as described for the high carton plow assembly 40. The same front slope action applies on this plow to cause the plow assembly to lift up and stop the uncaser if there is a bad misalignment of the bottles which the plows cannot align properly to enter the pulleys and belt pairs.

The manner of attachment of each of the plows for quick change will now be explained. The plow assembly is considered complete as is shown in FIGS. 7 and 18 and is attached to the uncaser head by means of two plow attach arms numbered 150 and 151. The plow assembly is attached by sliding over arms 150 and 151 and ring pins are dropped in the four holes which are numbered 152; the pins are designated by numeral 153. These portions of the plow attaching means may best be seen in FIGS. 7 and 12. The plow attach arms 150 and 151 in turn are attached permanently to the uncaser head by means of the bearing assembly designated 130. The purpose of easy removal of the plows is so that they can be changed for different bottle and case types and also to facilitate changing of the belt in case of belt breakage. The plow may be swung up manually to assume a substantially vertical position to facilitate straightening out of any bottle or carton jams which may have caused a stoppage. The belt pairs and pulleys, together with the stainless steel belt guides in association therewith are substantially the same as disclosed in U.S. Pat. No. 2,758,731 dated Aug. 14, 1956 by A. C. Davis. While the two plows which have heretofore been described in connection with the present invention head are designed to accommodate four rows of bottles, this is not necessarily intended to be a limitation on the present invention machine. Another head, together with an associated plow either for returnable or nonreturnable bottles may be substituted wherein there may be different numbers of rows of bottles. For example, in most 32 ounce or quart bottle cases there are 3 rows of bottles per case and, therefore, there would be 3 pairs of belts and the plow would be designed accordingly.

The clearing feature for the present invention machine in a situation wherein there has been a jam will now be explained. A jamming situation may take place within the belt or pulley area itself. The entire head is supported by means of two V-wheel pulleys on the upper end which are designated by the pulleys **520** which pulleys **520** are supported on V-shaped ways **400** which have end stops **401** and **402**. The pulleys **520** are shaped so as to ride along V-shaped ways as best shown in FIG. **19**. The shape of the V pulleys **520** and the V-shaped mating member **400** is such that it prevents any sideways motion of the head, but will allow the head to roll forward and backward in a horizontal plane during the clearing function which will be described later. The lower end of the head is supported on two clevises designated **129**. These clevises again prevent any sideways motion, but do permit rotary motion when the head is raised. The clevis **129** supports member **130** and in turn is attached to the main shaft of air cylinders **180** and **181** which are shown in FIGS. **12** and **13** and will hereinafter be described as will the system in connection therewith (the clevises **129** are open at their top so that upon disconnection of the mechanical drive by removal of the chain sprocket **101**, the entire head may be lifted off the lower part of the machine, and upon disconnection of switch **131** by a connector provided for such purpose, the head may be removed from the vicinity of the machine and/or replaced by a different head). In the event of a bottle jam which requires clearing, air is supplied to cylinders **180** and **181** and the cylinder shaft and the clevis assembly. A schematic view of the pneumatic system for raising and lowering the lower end of the head **16** is shown in FIG. **13**. The head is shown in a raised position in FIG. **9**. Air is supplied to cylinders **180** and **181**. The shaft and clevis assembly is raised as shown in FIG. **9** by raising the lower end of the head high enough so that all bottles in the V belts are lifted completely clear of the case. The raising action of the cylinders is vertical and thereby pulling the bottles straight out of the case. In order to accomplish a vertical raise of the lower end, it is necessary for the upper end of the head to roll forward on the V-shaped wheels numbered **520**. The reason for rolling forward at that point horizontally is to insure that the drop point of the bottles is maintained in the same position with the bottle conveyor **17**. The previously described chain tension adjustment keeps the drive chain tensioned properly so that the head may be run in the raised position and the bottles which are in the belts can be released properly on the bottle conveyor. The air stop cylinder number **24** will then be in the actuated position during this operation so that no more cases are allowed to enter the machine while it is being cleared. After all bottles and cartons have been cleared out of the head, it is then lowered back into operating position and normal operation can be resumed. The rasing cylinders **180** and **181** are attached to the top of the stainless steel guide post plate **186** to permit height adjustments to be made on the machine. The selector valve which controls the up and down motion of the raising cylinders **180** and **181** is manually operated through lever **220** which is shown in FIG. **1** and the valve associated with and actuated by lever **220** is designated as **221** in FIG. **13**.

Switch SW1 is the main power switch controlling all the 110 volt (main power) circuits. SW2 and SW4 are the start and stop buttons respectively for the main drive motor. SW3 and SW5 are the start and stop buttons respectively controlling case flow infeed by means of the case stop assembly **21**. With SW1 on, a momentary closure of SW2 will cause the magnetic starter to close, thereby providing power to the main drive motor. The starter coil is magnetically latched through its own contacts and will remain closed after SW2 contact is lost and can only be released by momentary closing of SW4 or by momentary actuation of switch **131** on the plow assembly. The motor can only be restarted by restoring **131** to normal operating position and closing SW2 again, thereby preventing accidental starting when an operator is clearing the jam which caused which caused **131** to actuate. With SW1 on, momentary closure of SW5 will cause relay R1 to close and will provide power to valve V1 thereby actuating cylinders **24** and stopping the flow of cases to the uncaser. Relay R1 latches itself magnetically and will remain closed after SW5 contact is lost. Momentary actuation of SW3 breaks the magnetic latch circuit of R1 releasing V1 and cylinder **24** and permitting the cases to flow again. Case flow may also be stopped in a similar manner by momentary actuation of the main drive switch SW4 or the plow safety switch **131**. Case flow can only be restarted by returning **131** to normal operating position and breaking the latch circuit by actuating SW3. Switch SW6 is located externally from the uncasing machine on conveyor **17** or some subsequent conveyor and is used to automatically control the flow of cases into the uncaser in accordance with the demand of subsequent machines or operations. When SW6 is actuated, it provides power directly to valve V1 and actuates case stop assembly **21**, but does not actuate relay R1 or the latch circuit and, therefore, release of SW6 will automatically remove power from V1 and release cases without using SW3 to reset the system.

I claim:

1. A case bottle handling apparatus for unloading bottles in a substantially upright position in a case comprising:

a bottle gripping assembly having an entrance end and an exit end;

means adapted for moving said cases below and past said entrance end of said bottle gripping assembly;

a first raising means for raising and lowering said entrance end and said exit end of said bottle gripping assembly in unison for accommodation of bottles of different sizes; and

a second raising means for raising said entrance end without substantially changing the height of said exit end so that said bottle gripping assembly may be operated with said entrance end raised to clear bottles out of said bottle gripping assembly.

2. The apparatus of claim **1** wherein:

said first raising means is a means for accurately adjusting the height of said bottle gripping assembly; and

said second raising means is an independent raising means adapted to quickly raise said entrance end from a height determined by said first raising means to a substantially higher position.

3. The apparatus of claim **2** wherein said second raising means is a pneumatic means.

4. The apparatus of claim **1** wherein:

one of said ends of said bottle gripping assembly is pivotally supported; and

the other of said ends is supported on rollers resting on laterally extending surfaces.

5. The apparatus of claim **4** wherein:

said rollers have "V" grooves on the periphery thereof and rest on mating laterally extending inverted "V" shaped members; and

said inverted "V" shaped members have stops for said rollers adjacent the ends thereof.

6. The apparatus of claim **5** wherein said rollers are on said exit end of said bottle gripping assembly.

7. A case bottle handling apparatus for unloading bottles in a substantially upright position in a case comprising:

a bottle gripping assembly having an entrance end and an exit end;

means adapted for moving said cases below and past said entrance end of said bottle gripping assembly;

a first raising means for raising and lowering said entrance end and said exit end of said bottle gripping assembly in unison for accommodation of bottles of different lengths;

a second raising means for raising said entrance end without substantially changing the height of said exit end so that bottle gripping assembly may be operated with said entrance end raised to clear bottles out of said bottle gripping assembly;

means for driving said bottle gripping assembly attached to the stationary portion of said apparatus; and

said bottle gripping assembly and said stationary portion of said bottle handling apparatus being readily separable upon disconnection of said driving means.

8. A case bottle handling apparatus for unloading bottles in a substantially upright position in a case comprising;

a bottle gripping assembly having an entrance end and an exit end;

a first means adapted for moving said cases below and past said entrance end of said bottle gripping assembly;

a plow assembly located near the entrance end of said bottle gripping assembly for automatically aligning bottles within a case into predetermined rows prior to entering said bottle gripping assembly;

said plow assembly being pivotally attached to the bottle gripping assembly so that badly misaligned bottles will strike said plow assembly and cause it to pivot upward; and

a second means cooperatively disposed with said plow assembly to stop said bottle gripping assembly upon the upward pivoting of said plow assembly.

9. The apparatus of claim 8 wherein said second means is a switching means attached to said bottle gripping assembly.

10. The apparatus of claim 9 wherein said plow assembly is secured to said bottle gripping assembly by quick release means.

11. The apparatus of claim 8 further including means for automatically stopping the flow of cases to the vicinity of said bottle gripping assembly upon the upward pivoting of said plow assembly.

12. The apparatus of claim 8 further including means for automatically aligning and centering said cases with respect to said bottle gripping assembly as said cases are directed toward said plow assembly.

13. The apparatus of claim 12 wherein said means for centering said cases are adjustable to accommodate cases of different sizes.

14. A case bottle handling apparatus for unloading bottles in a substantially upright position in a case comprising:

a bottle gripping assembly having an entrance end and an exit end;

means adapted for moving said cases below and past said entrance end of said bottle gripping assembly;

a first raising means for accurately raising and lowering said entrance end and said exit end of said bottle gripping assembly in unison for accommodation of bottles of different sizes;

a second raising means for raising said entrance end from a height determined by said first raising means to a substantially higher position without substantially changing the height of said exit end so that said bottle gripping assembly may be operated with said entrance end raised to clear bottles out of said bottle gripping assembly;

a plow assembly located near the entrance end of said bottle gripping assembly for automatically aligning bottles within a case into predetermined rows;

said plow assembly being pivotally attached to said bottle gripping assembly so that badly misaligned bottles will strike said plow assembly and cause it to pivot upward; and

a stopping means cooperatively disposed with said plow assembly to stop said bottle gripping assembly and to stop the flow of cases to the vicinity of said bottle gripping assembly upon the upward pivoting of said plow assembly.