Nov. 12, 1968 J. A. JOHNSON 3,410,046

CASE FILLING AND STACKING MACHINE

Filed Dec. 3, 1964 4 Sheets-Sheet 1

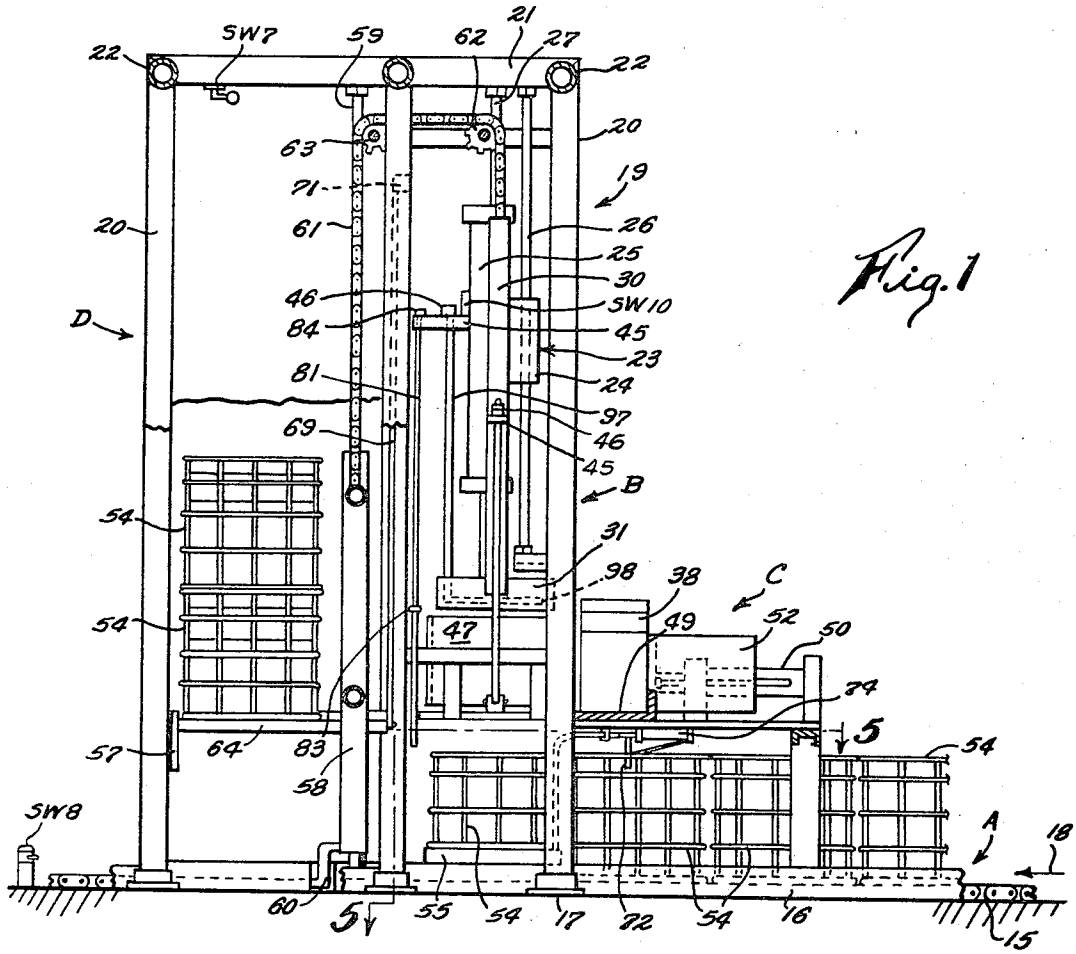


Fig. 1

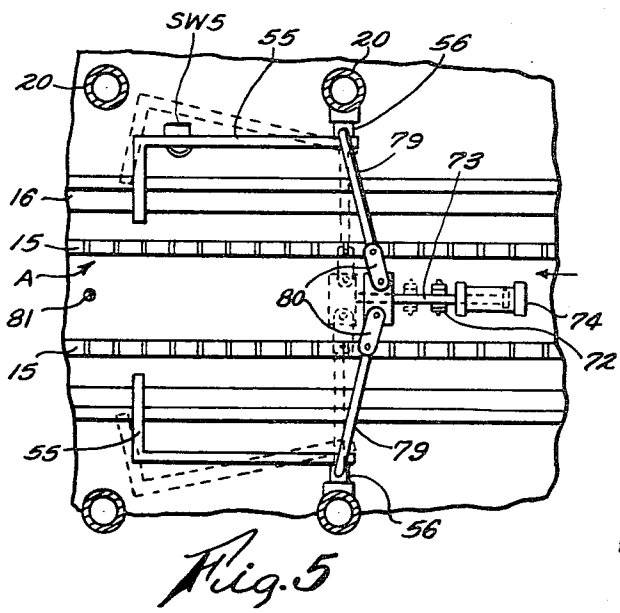


Fig. 5

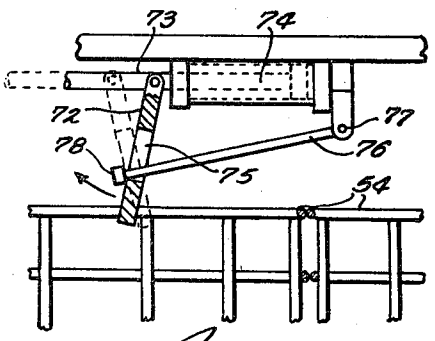


Fig. 6

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Fig. 2

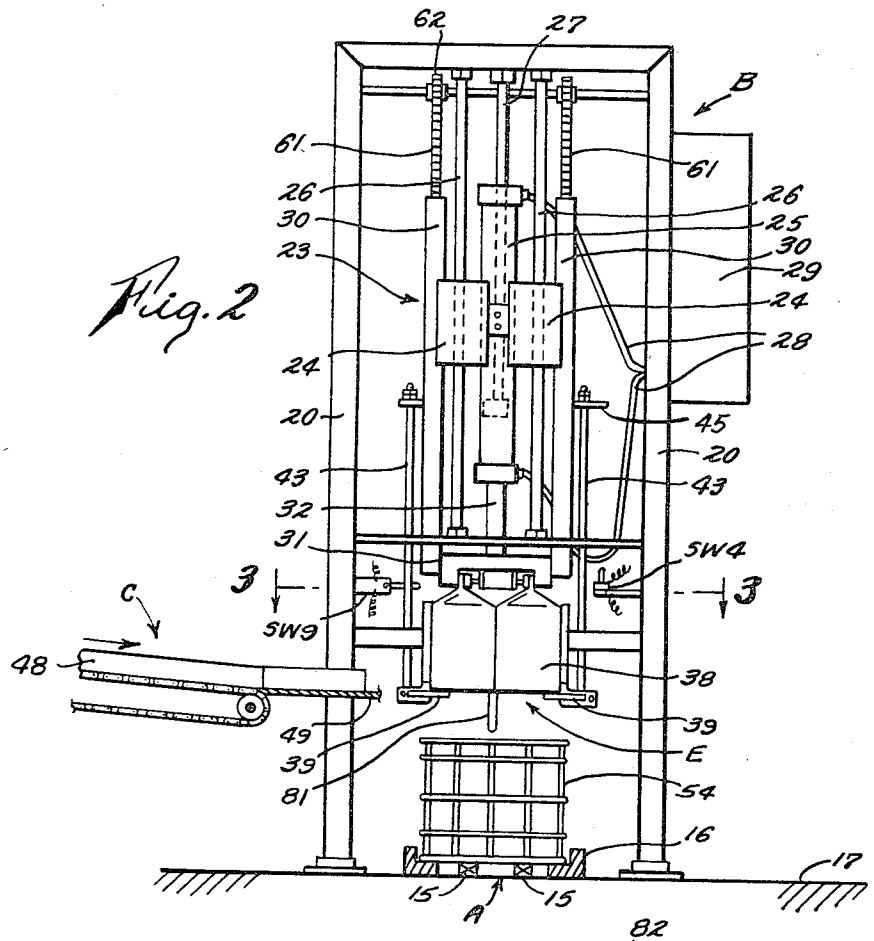
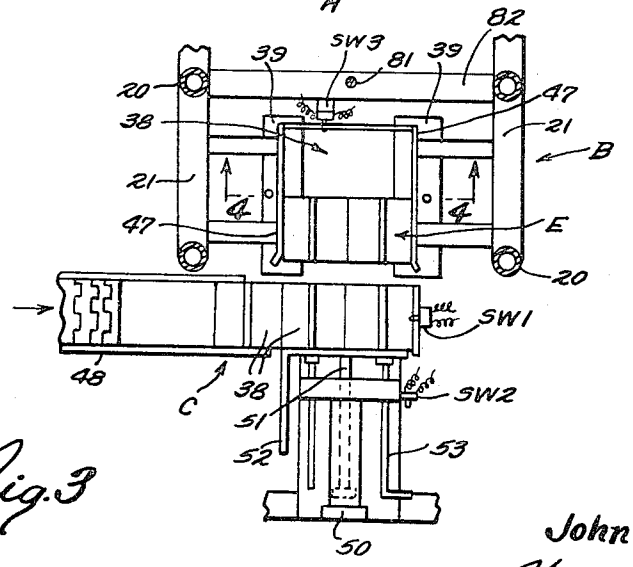


Fig. 3



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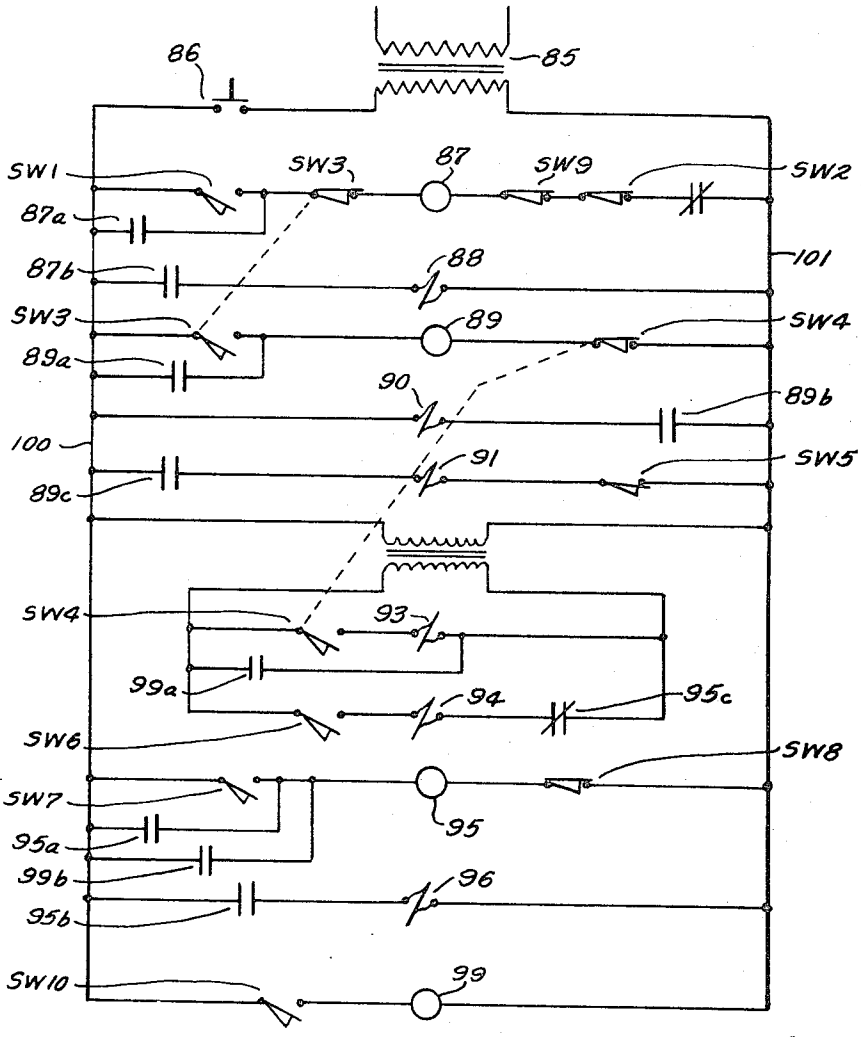


Fig. 9

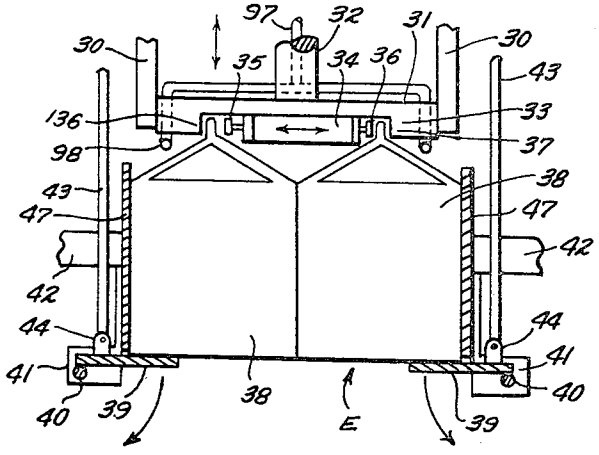


Fig. 4

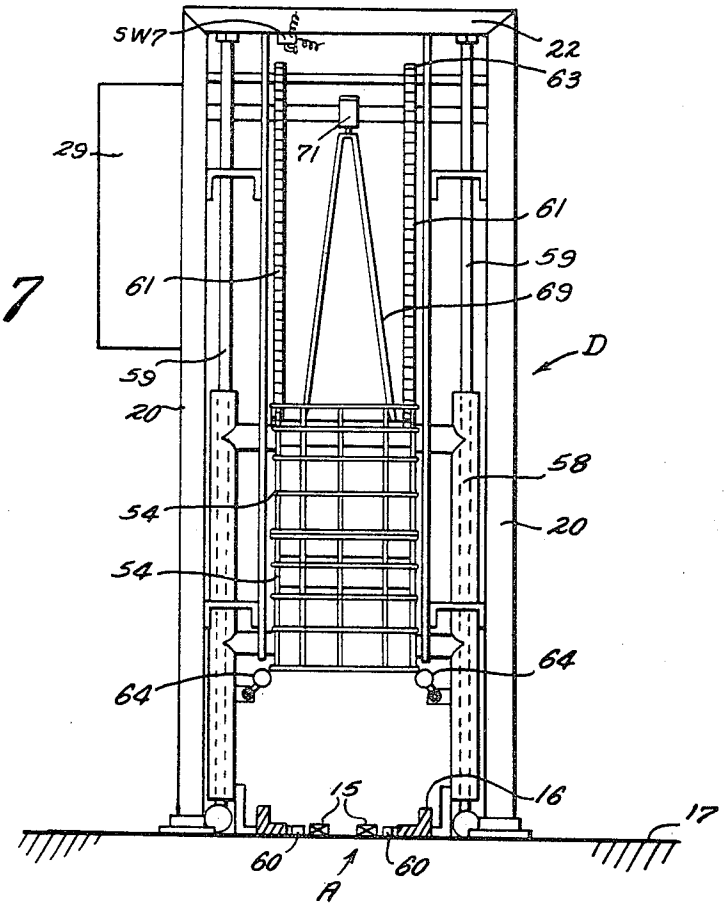
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Fig. 7



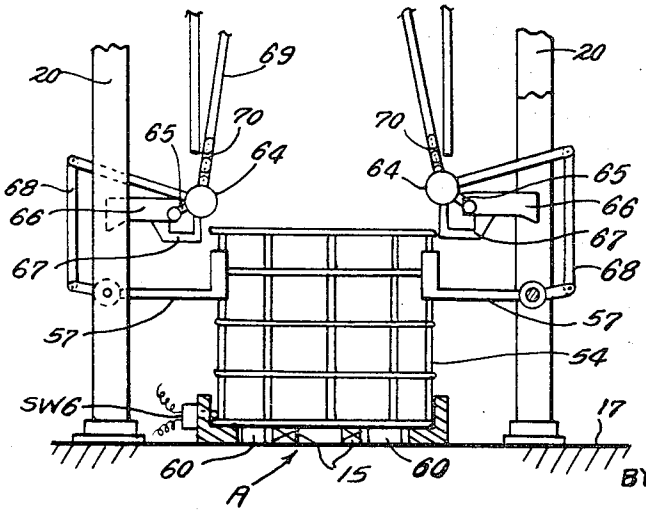


Fig. 8

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United States Patent Office 3,410,046
Patented Nov. 12, 1968

3,410,046

CASE FILLING AND STACKING MACHINE

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Filed Dec. 3, 1964, Ser. No. 415,667
15 Claims. (53—61)

ABSTRACT OF THE DISCLOSURE

Apparatus adapted to assemble gabled cartons containing milk, or the like, in patterns, depositing the cartons in patterns into shipping cases, and then vertically stacking the filled shipping cases. A counter-balancing means between the carton pattern lowering means and the stacker raising filled cases into stacked position. Conveyor located switches operated by movements of cases on a conveyor controlling the casing and stacking mechanisms.

The present invention relates to improvements in machines for filling cases with containers, such as milk cartons, and is particularly directed to simplified and coordinated mechanisms adapted to load milk cartons into cases, stack the filled cases and then deliver the stacked cases to a loading or a storage station.

An object of this invention is to provide a novel and efficient carton caser and stacker apparatus that transfers the potential energy available at the case filling station to the case stacking station, whereby, in operation, the descending mass of the carton pattern being loaded into a case at the case filling station will substantially counter-balance a filled case being elevated to stacked position at the stacking station.

Another object of the invention is to provide a unitary, compact and cooperative caser and stacker apparatus that is positioned above a continuously operated, uni-directional conveyor whereon empty cases are moved one at a time into the caser and each filled with a pattern of cartons, each filled case being moved on the conveyor to a case stacking station and the stacked cases being finally moved on said conveyor to a plant loading or a plant storage station; case movement being controlled by a series of conveyor located switches actuated by the cases.

A further object of this invention is to provide a simplified yet rugged case filling device wherein a pattern of cartons is supported in assembled condition directly under and within the case filling mechanism, said casing device including means for rendering the carton pattern support inoperative coincident with the initial operations of the carton gripping and the carton lowering mechanisms.

A further object of the invention is to provide in an apparatus having the foregoing characteristics an automatic means for sensing and rejecting defective cases which when actuated will permit the defective case to move directly through and out of the device.

A still further object of the invention is to provide a simplified control system for my caser and stacking device.

Still further objects of the invention will become apparent from the following specification taken in conjunction with the accompanying drawings which show a preferred embodiment of my invention; it being understood that various modifications could be made therein in order to handle other kinds, numbers and sizes of containers without departure from the terms of the appended claims.

In the drawings wherein like reference numerals and letters indicate like elements throughout the several views:

FIG. 1 is a front elevational view of my case filling and stacking apparatus, parts thereof being broken away and other parts shown in section.

FIG. 2 is a fragmental, side elevational view of the case filling device of my invention, parts being shown in section.

FIG. 3 is a section taken on line 3—3 of FIG. 2.

FIG. 4 is an enlarged section taken on line 4—4 of FIG. 3.

FIG. 5 is an enlarged, fragmental section taken on line 5—5 of FIG. 1.

FIG. 6 is a section showing a detail of the case entrance gate for my apparatus.

FIG. 7 is a side elevational view of the case stacking device for my apparatus, parts being shown in section.

FIG. 8 is an enlarged, fragmental view of the case exit gate for my apparatus, parts being shown in section.

FIG. 9 is a diagrammatic view of the electrical control system for the apparatus shown in FIGS. 1–8 of the drawings.

With reference to the drawings my apparatus, in general, is associated with a continuously operated, unidirectional case conveyor A comprising a pair of chains 15—15 located within a track 16 in the floor 17 of a dairy plant, or the like; said chains being moved by a source of power (not shown) in the direction of the arrow 18 (FIG. 1). The initial station of my apparatus comprises a case filling device B positioned above the conveyor A and which is served by a milk carton receiving and transfer device C (FIGS. 2 and 3). A case loaded with its pattern of cartons is moved by the conveyor A from the case filling device B to a second station wherein the filled cases are vertically assembled by a case stacking device D and the stacked cases are then moved by the conveyor A to a plant loading or a plant storage station (not shown).

My apparatus is of unitary design and as shown in FIG. 1 is contained within a floor mounted frame 19 that straddles the conveyor A and is preferably constructed of vertical members 20, longitudinal members 21 and cross members 22 connected together as by welding to form a rigid machine base.

Now with reference to FIGS. 1–4 of the drawings the case filling device B comprises a vertically reciprocable carriage 23 that includes a pair of guide blocks 24—24 welded to the central part of a motor means which takes the form of an air cylinder 25, each block being slidable on a vertical guide rod 26—26 suitably mounted at its respective ends to the frame 19. The upper end of the piston rod 27 for the air cylinder is fixed to the frame, flexible hoses 28 for introducing air under pressure into the cylinder ends to reciprocate the carriage 23 being connected to a source of air pressure provided from a machine control box 29. The carriage also has a vertical structural member 30—30 welded to the outer side of each guide block 24—24, said members being connected at their lower ends as by welding to a carton gripping device 31, said device also being fixed on an extension 32 of the air cylinder 25.

With reference to FIG. 4 it will be noted that the carton gripping device 31 may comprise a head 33 having a double acting, air cylinder 34 mounted thereon, said air cylinder including a pair of laterally movable, piston actuated jaws 35 and 36 which cooperate with depending shoulders 36 and 37, respectively, on the head 33 to provide carton gable grippers for a pattern of milk cartons E assembled beneath the head 33.

The movable jaws 35 and 36 are contracted into normally withdrawn positions by a spring return device located internally in the cylinders and are actuated to gable gripping positions with respect to the fixed jaws by air introduced under pressure into the central part of the cylinder.

The case filling device has a carton assembly and carton pattern station **38** located directly beneath and in vertical alignment with the gripper head **31**, said pattern station having a pair of opposed carton support plates **39—39** each pivotally mounted at its outer end on the frame by means of a pivot pin **40—40** carried by a bracket **41—41** which in turn is connected to the frame by an extension member **42—42**. As best shown in FIG. 4 a quick acting support and release device for each plate takes the form of a vertical rod **43—43** pivotally connected at its lower end in a yoke **44—44** fastened to its respective plate interiorly of and close to a pivot pin **40—40**. The rod **43—43** for each plate has its upper end slidable in a projection **45—45** on cylinder **25** (FIG. 1) and includes an adjustable stop **46—46** at its terminal end extension above the respective projections **45—45**. When the case filling device is in its upper inoperative position the projections **45—45** will engage under the stops **46—46** and maintain and connected plates **39—39** in horizontal, carton pattern receiving positions, but with the initial movement of the filling device downwardly the projection will disengage the stops and the weight of the carton pattern will instantly pivot the plates downwardly out of the way of the descending carton pattern. It will also be noted with reference to FIGS. 2–4, inclusive, that fixed carton guide plates **47—47** are carried by members **42—42** to maintain the carton pattern in a compact condition. It will further be noted that when the cartons **38** are held upon the support plates **39—39** in an assembled position that their gables are located between the fixed and stationery jaws of the gripper mechanism **31** in position to be gripped by the jaws.

The carton receiving and transfer station C is best shown in FIGS. 1–3 of the drawings and may comprise a chain conveyor **48** adapted to move cartons **38** in single file onto a transfer table **49** that is on a level with the carton support plates **39—39** at the carton assembly and pattern station **38**. With reference to FIG. 3 it will be seen that as a row of say two cartons are moved into transfer position upon the table **49** the leading carton in the row tips a switch SW–**1** which operates a transfer device including a fixed air cylinder **50** having its piston rod **51** connected to an L-shaped carton pusher member **52**. The air cylinder is adapted to reciprocate a distance equal to the width of the cartons assembled on the transfer table **49**, such movement being limited by a control rod **53** movable with the pusher member and adapted to contact and trip a switch SW–**2** at the outermost limit of motion of the piston rod **51**. The cylinder **50** continues to actuate the pusher member until the desired number of rows of cartons are assembled in a pattern upon the support plates **39—39** whereupon the leading row of cartons in the pattern contacts a switch SW–**3** which will initiate gripping momvement of the gripper **31** and initial movement of the case filling device B, such movements being momentarily delayed to allow for retraction of the pusher bar from the path of the case filling device.

As the case filling device is moved downwardly by the air cylinder **25**, the pattern of cartons held by the carton gripping device will be deposited in an awaiting case **54** held in loading position upon the conveyor **15** by a pair of cooperative, L-shaped arms **55—55** mounted for horizontal movements toward and away from each other on vertical pivots **56—56** fixed to the frame in any suitable manner (FIG. 5). Upon opening movements of the stop arms the filled case **54** is released to be moved by the conveyor **15** until it is stopped by a pair of retractable arms **57—57** pivotally mounted on the frame at the stacker device D. These latter arms hold the filled case in position for elevation into stacked condition, as will now be specifically described.

With reference to FIGS. 1, 7 and 8 of the drawings the case stacker B comprises a vertically reciprocal elevator frame **58** slidable on guide rods **59—59** mounted at their ends on the frame **19**. A pair of case lifting arms **60—60** are connected to the lower end of the elevator frame and are normally positioned beneath and one on each side of a conveyor chain **15** between said chain an dthe track **16**. The vertical movements of the elevator frame **58** are related to the vertical movements of the vertically reciprocable carriage **23** at the case filling station B by a coordinating and counter-balancing means which preferably takes the form of a pair of flexible cables such as chains **61—61** each passed over a pair of longitudinally spaced apart toothed idler sprockets **62** and **63** that are in turn suitably mounted on the frame **19**. One end of each chain is connected to the member **30** on the carriage **23** while the opposite end of each chain is connected to the elevator frame **58**. It will therefore be understood that as the carriage **23** is reciprocated by the air cylinder **25** to lower a pattern of cartons into an awaiting case and then return to normal position the coordinating chains will operate the elevator frame **58** to raise a filled case into stacked position in the stacker and return the elevator frame to normal position. Thus, the stacker elevator utilizes the energy created by the descending mass of cartons at the case filling station to aid in elevating the filled carton into a stacked position whilst the return movements of boh the elevator frame and the case filling carriage are accomplished in substantial equilibrium thus obtaining a minimum expenditure of power for the several operations.

The case elevator frame at the stacking station D is adapted to lift a filled case **54** from the conveyor **15** up between a pair of stack supporting dogs **64—64**, and, as best shown in FIG. 8, each dog has a downwardly and outwardly extending pair of arms **65—65** fixed thereto which in turn are mounted on horizontal pivots carried by extension members **66—66** of the frame **19**. When a case is moved upwardly between the dogs by the elevator said dogs are freely moved apart by the case and as the case moves above said dogs they fall by gravity into support positions beneath the case to support the stack, the dogs being held in stack supporting positions by suitable stops **67** on the extensions **66—66**. Movement of the dogs **67** is coordinated with the case stop **57** by a pivoted linkage **68** whereby retracted positions of the dogs will result in moving the stops **57** out of case contacting positions relative to the conveyor A. A dog and stop release takes the form of an inverted V-yoke **69** secured by loose connections **70** to the dogs and connected at its upper end to a retracting air cylinder **71**.

A case arresting entrance gate is located above the conveyor which initially contacts empty cases **54** and may comprise a depending arm **72** (FIG. 6) pivotally mounted on a piston rod **73** of an air cylinder **74** positioned on the frame **19** beneath the transfer station C, said arm having a slot **75** therein for receiving a gravity link **76** pivoted at **77** to the frame and having a stop **78** on its outer free end beyond the arm **72**. As shown in full lines in FIG. 6 the arm and link are at acute angles to one another, thus permitting the arm to hang freely for movement of the line of empty cases being urged forward on the conveyor A. When the air cylinder **74** is operated its piston rod **73** will move to the left as indicated by the dotted lines in FIG. 6, thus permitting the link **76** and arm **72** to assume right angular, rigid positions that will arrest movement of the line of cases while the holding arms **55—55** are momentarily open.

With reference to FIG. 5 it will be seen that the arms **55—55** are connected to the lower ends of L-shaped cranks **79—79**, the inner end of said cranks being connected to the piston rod **73** of the air cylinder **74** by flexible link connections **80—80**. As indicated in dotted lines in FIG. 5, actuation of the air cylinder **74** will move the arms **55—55** through the lever and linkage to the dotted line positions which will permit the filled case to move therethrough upon the conveyor A, said air cylinder actuation also rigidifying the entrance gate to prevent forward movement of the line of cases on conveyor A.

In order to assure return of the case lifting arms **60—60** of the case stacker D to their inoperative positions beneath the conveyor A before a filled case **54** is moved on said conveyor from the case filling station B into stacking position I provide a retractible stop rod **81** (FIGS. 1, 3 and 5) guided at its lower end for vertical movement through an aperture in a transverse frame member **82** and having its upper end slidable in one projection **45** fixed on the carriage **23**. The rod has a shoulder **83** thereon which defines its lower limit of motion at which limit the lower terminal end thereof projects into the path of a filled case, the rod having a shoulder **84** at its upper end which is engaged by the projection **45** to withdraw the rod from the path of the filled case when the carriage **23** and the lifting arms **60—60** are in their inoperative positions.

Operation

The operation of my device will now be described with particular reference to the electrical diagram shown in FIG. 9 of the drawings wherein the parts are shown in normal apparatus shut down or inoperative conditions and a step down transformer **85** is depicted that energizes lead lines **100** and **101** when a master switch **86** is manually closed. It is here assumed that an empty case **54** is initially being held in place on the place on the conveyor A beneath the case filling device B, by arms **55—55**, a line of empty cases is on the conveyor A behind said case beneath the filling device, a filled case is on the conveyor beneath the stacker D, and that filled cartons **38** are being delivered to the transfer station C on conveyor **48** with their respective gables crosswise relative to the conveyor **48**. As a row of cartons is completed on table **49** the switch SW–1 will be momentarily closed, thus energizing a coil relay **87** which closes holding contact **87***a* and contact **87***b* which in turn actuates solenoid **88** to operate air cylinder **50** and its pusher **52** to slide a row of cartons onto the support plates **39—39** a distance equal to the overall width of the cartons. The gables of the cartons in the row are slid between the awaiting contracted or open jaws of the gripper **31** by such movement. As the pusher reaches its outer limit of motion switch SW–2 is momentarily opened to open holding contacts **87***a* and **87***b* and de-energize coil relay **87** and solenoid **88** to cause return of the pusher for the reception of the next row of cartons. This sequence is continued until the required number of carton rows have been fed onto plates **39—39** to make up the carton pattern E whereupon switch SW–3 will be closed loading coil relay **89** which closes holding switch **89***a* and normally opened switch contacts **89***b* and **89***c* which latter switches respectively operate the gripper head solenoid **90** for air cylinder **34** and makes the circuit to the elevator solenoid **91** for air cylinder **25** provided switch SW–5 is closed by the presence of a case in filling position on the conveyor A. Thus the pattern of cartons will be gripped and the pattern lowered into the awaiting case by the carriage. As the carriage reaches its lowermost position one projection **45** on carriage **23** will contact and open switch SW–4 de-energizing solenoid **89** which opens switch contacts **89***b* and **89***c* to stop descent of the elevator and releases the gable grippers to deposit the carton pattern in the awaiting case, respectively. Contact with switch SW–4 also closes a low voltage line to solenoid **93** which momentarily operates air cylinder **74** to open arms **55—55** and allow the conveyor A to initially move the filled case toward stacking position. The initial retraction of the arms **55—55** will open switch SW–5 thus de-energizing solenoid **91** and causing the air cylinder **25** to raise the carton gripper and simultaneously lower the stacker to their inoperative positions, the filled case on the conveyor A being arrested and delayed by the stop rod **81** until such time as the stacker is in its lowermost position between the tracks **16—16**.

When air cylinder **74** opens the arms **55—55** it also releases gate **72** which allows the leading case on the row of empty cases on conveyor A to be moved into filling position to thus again close switch SW–5 and condition its circuit for the next operation. As the filled case reaches stacking position it closes switch SW–6 which energizes solenoid **94** that in turn operates air cylinder **74** to close arms **55—55** and rigidify entrance gate lever **72**. As has been stated each time a carton pattern is lowered by the carriage into an awaiting case at the filling station a filled case is raised into stacked position by the stacking device by reason of the means interconnecting the carriage and the stacking device.

The foregoing sequence of operation is repeated until a complete stack of filled cases is present in the stacker at which time switch SW–7 is closed to energize coil relay **95** which when energized closes normally opened holding contacts **95***a*, contacts **95***b* and opening closed contacts **95***c*. The closing of contacts **95***b* energizes solenoid **96** which operates air cylinder **71** retracting the stack supporting dogs **64—64** and simultaneously opening exit gate arms **57—57** which allows the stacked cases to be lowered onto the conveyor A, the conveyor carrying the stacked cases out of my apparatus, said stack of cases closes switch SW–8 which de-energizes coil relay **95** allowing the stack support dogs **64—64** to return to operative position and closing exit gate arms **57—57**.

Delay means is provided to assure delay operation of the carton receiving and transfer device C until the case filling device is in its upper inoperative position, such means comprising a normally closed switch SW–9 (FIGS. 2 and 9) interposed in the circuit of coil relay **87** which is opened upon initial downward movement of the carriage and remains opened until return of the carriage to its upper inoperative position.

My apparatus has a defective case sensing and rejecting device comprising a vertical rod **97** (FIG. 1) carrying at its lower end a horizontally disposed U-shaped spider **98** disposed superjacent the tops of the carton pattern E held by the jaws of the gripper head. In the event the pattern of cartons being lowered by the filling device would meet an obstruction caused by a defective case, or for some other reason, the cartons in the pattern would be somewhat crushed by the stoppage thus moving the rod **97** upwardly thereby closing switch SW–10 that in turn actuates coil relay **99** and closes normally open contacts **99***a* and **99***b*, the closing of contacts **99***a* causing actuation of solenoid **94** and operation of air solenoid **74** to open case stop arms **55—55** to allow the defective case to move on conveyor A. As SW–5 is on one arm **55** it will be opened thus causing return of the elevator carriage to its inoperative upper condition and return of the stacker to its lower position.

At the time a defective case is rejected from the case filling device another set of normally open contacts **99***b* are closed energizing coil relay **95** to operate the air cylinder **71** thus simultaneously operating the stack dogs **64—64** and exit gate **57—57** to permit whatever stack of cases are in the stack at the time of the defective case rejection to be carried out of my apparatus, the defective and rejected case being allowed to enter the stacker as the topmost case in the next stack made in the stacker for ready detection and removal.

Actuation of coil relay **99** will also open normally closed contacts **95***c* which will return exit stop arms **57—57** and stack dogs **64—64** to normal operative positions since the defective case at that time would have closed switch SW–6 to energize solenoid **94** and said circuit thereto should be de-energized momentarily to allow an empty case to pass entrance gate **72** and be positioned in the filling device in the place of the defective and rejected case.

Having thus described my invention, what I claim as new is:

1. In a case filling and case stacking machine the combination of a carton assembly station, a carton gripping device adapted to periodically lower the assembled car-

tons into a case, a case stacking device adapted to periodically receive a carton filled case and raise it into stacked position, and counter-balancing means interconnecting the carton gripping device to the case stacking device.

2. In a case filling and case stacking machine the combination of a vertically reciprocable carton gripping device, motor means for reciprocating the carton gripping device, a carton assembly station subjacent the carton gripping device, said device being adapted to periodically lower assembled cartons into a case, a case stacking device adapted to periodically receive a carton filled case and raise it into stacked position, and counter-balancing means operatively connecting together the carton gripping device and the case stacking device.

3. In a case filling and case stacking means the combination of a unidirectional case conveyor, a carton assembly station positioned above the conveyor, a case stop means adapted to locate a case on the conveyor beneath the carton assembly station, a vertically reciprocable carton gripping device, motor means for reciprocating the gripping device and adapted to periodically lower an assemblage of cartons into the positioned case, a case stacking device positioned above the conveyor adjacent and downstream from the carton assembly station, said case stacking device being adapted to periodically receive a filled case from the conveyor and raise it to stacked position above the conveyor, and counter-balancing means operatively connecting together the carton gripping device and the case stacking device.

4. In a case filling and case stacking means as set forth in claim 3 wherein the counter-balancing means comprises an idler located vertically above the carbon gripping device, an idler connected vertically above the stacking device, and a flexible cable means having each end connected to a device and having an upper reach movable over said idlers.

5. In a case filling and case stacking means as set forth in claim 4 wherein the flexible cable means is a chain and the idlers are each a free running sprocket gear.

6. In a machine for loading a carton pattern into a case, the combination of a frame, a vertically reciprocable carriage on the frame, a carton gable gripping device on the carriage, a carton pattern assembly station subjacent the gable gripping device including a pair of opposed carton support plates, pivot means on the frame outside the assembly station pivotally mounting the support plates, a support rod connected to each plate inside and closely adjacent the pivot means, a slidable connection between the carriage and the upper end of each rod, and a stop means on each rod engagable by the carriage to maintain each rod and plate in carton supporting position.

7. In an apparatus of the class described a continuously moving, unidirectional case conveyor, a carton filling station positioned above the conveyor, retractable stop means adjacent the conveyor at the filling station normally retaining a line of empty cases against motion on the conveyor and adapted to position the leading case in the line in carton filling position, a carton pattern assembly device above the conveyor at the filling station, a vertically reciprocal carton pattern gripping device, motor means for lowering the carton pattern from the carton assembly device into the leading case held on the conveyor by the stop means, control means responsive to the presence of a full complement of the cartons in the leading case reversing the movement of the motor means and simultaneously releasing the carton pattern gripping device; said control means retracting the case stop means to permit movement of the filled case on the conveyor, normally inoperative case entrance gate means, means operable with the retraction of the stop means for rendering the case entrance gate means operable, a case stacking station above the conveyor and located downstream from the case filling station, a retractable case exit gate adjacent the conveyor at the case stacker station adapted to hold the filled case in stacking position, a vertically reciprocal case raising and case stacking elevator above the held filled case, counter-balance means connecting together the case stacking elevator and the carton pattern gripping device, and means responsive to the accumulation of a stack of filled cases at the stacking station lowering the elevator with the stack onto the conveyor and simultaneously retracting the case exit gate to permit movement of the stack on the conveyor.

8. A machine for transferring a pattern of gabled cartons into a case comprising a continuously moving, unidirectional case conveyor, a frame disposed over the conveyor, a retractable case stop means adjacent the conveyor within the confines of the frame, a transfer table adjacent the frame, means accumulating a row of cartons on the table, a pair of opposed carton pattern support plates, each pivotally mounted at its outer side on the frame and above the case held by the stop means on the conveyor, normally operative means for maintaining the support plates flush with the table, reciprocating pusher means adapted to periodically feed a pattern of cartons onto the support plates, a vertically reciprocable carriage above the plates, a gable gripping means on the carriage having opposed expanded jaws disposed on a level to receive between them the gables of the pattern of cartons fed onto the plates, means responsive to the completion of the pattern of cartons on the plates for rendering the gripping means operative, delayed action means made operative to render the support plates inoperative and then lower the carriage and deposit the carton pattern into the case, and means operative upon the deposit of the carton pattern into the case retracting the stop means to permit the conveyor to carry away the filled case.

9. In apparatus of the class described a floor positioned, continuously moving, unidirectional case conveyor, a floor mounted frame positioned over a portion of the conveyor, retractable stop means normally disposed in the path of a case on the conveyor and adapted to position said case within the lower confines of the frame, a releasable carton pattern assembly device on the frame in vertical alignment with the empty case, a carriage mounted on the frame for vertical reciprocation above the carton pattern assembly device, a carton pattern gripping device depending from the carriage, power means for lowering the carton pattern from the carton assembly device into the case, control means responsive to the presence of a full complement of cartons in the case reversing the movement of the power means and simultaneously releasing the carton pattern gripping device, means responsive to the actuation of the control means for retracting the case stop means to permit movement of the filled case on the conveyor, a case stacking station on the frame above the conveyor, a retractable case exit gate across the conveyor subjacent the case stacking station adapted to hold the filled case in stacking position, a vertically reciprocal case raising and case stacking elevator above the held filled case, coordinating, control means between the case stacking elevator and the carriage, and means responsive to the accumulation of a stack of filled cases at the stacking station lowering the elevator with the stack onto the conveyor, and means simultaneously retracting the case exit gate to permit movement of the stack on the conveyor and out of the frame.

10. In apparatus of the class described in claim 9 wherein the retractible stop means comprises a pair of barrier members, means mounting each of the members on the frame on opposite sides of the conveyor for lateral movement toward and away from each other, and reversible motor means for operating the barrier members in unison.

11. In apparatus of the class described in claim 10 wherein a case sensing control switch is disposed for actuation by the empty case when said case is held in carton filling position by the retractible stop means.

12. In an apparatus of the class described a unidirectional case conveyor, a carton filling station positioned

above the conveyor, retractible stop means adjacent the conveyor at the filling station and adapted to position the leading case in the line in carton filling position, a carton pattern assembly device above the conveyor at the filling station, a vertically reciprocal carton pattern gripping device, motor means for lowering the carton pattern from the carton assembly device into the leading case held on the conveyor by the stop means, control means responsive to the presence of the carton pattern in the leading case reversing the movement of the motor means and simultaneously releasing the carton pattern gripping device, said control means retracting the case stop means to permit movement of the filled case on the conveyor, a normally inoperative case entrance gate means, means operable upon retraction of the stop means rendering the case entrance gate means operable to momentarily delay movement of the line of empty cases by the conveyor, and a conveyor positioned control means, coordinated with the movement of the filled case by the conveyor beyond the carton filling station returning the retractible stop means and the case entrance gate means to normal positions.

13. In apparatus of the class described in claim **12** wherein the case stop means and the case entrance gate means are operated by a single reversible motor, and operating means connecting said motor to the control means.

14. In the apparatus set forth in claim **7** wherein a defective carton sensing means is disposed adjacent the carton pattern gripping device, and means made operative by the carton sensing means actuating the control means and the case exit gate to permit movement of the case with the defective carton out of the apparatus.

15. In an apparatus of the class described a unidirectional case conveyor, a carton filling station positioned above the conveyor, retractible stop means adjacent the conveyor at the filling station for retaining an empty case against further motion on the conveyor and adapted to position said case in carton filling position, a carton pattern assembly device above the conveyor at the filling station, a vertically reciprocal carton pattern gripping device, motor means for lowering the carton pattern from the carton assembly device into said case on the conveyor, control means responsive to the presence of the carton pattern in said case reversing the movement of the motor means and releasing the carton pattern gripping device, said control means retracting said stop means to permit further movement of the filled case on the conveyor, case entrance gate means which is operable to momentarily delay movement of an empty case by the conveyor into the carton-filling position while said stop means are retracted, and control means coordinated with the movement of the filled case by the conveyor beyond the carton filling station for returning said retractible stop means to its case-retaining position and for moving said case entrance gate means to a position where it no longer delays movement of an empty case.

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