

June 23, 1964

B. JOHNSON ET AL

3,137,981

MULTIPLE MAGAZINE FOR CARTONING MACHINE

Filed Jan. 16, 1961

4 Sheets-Sheet 1

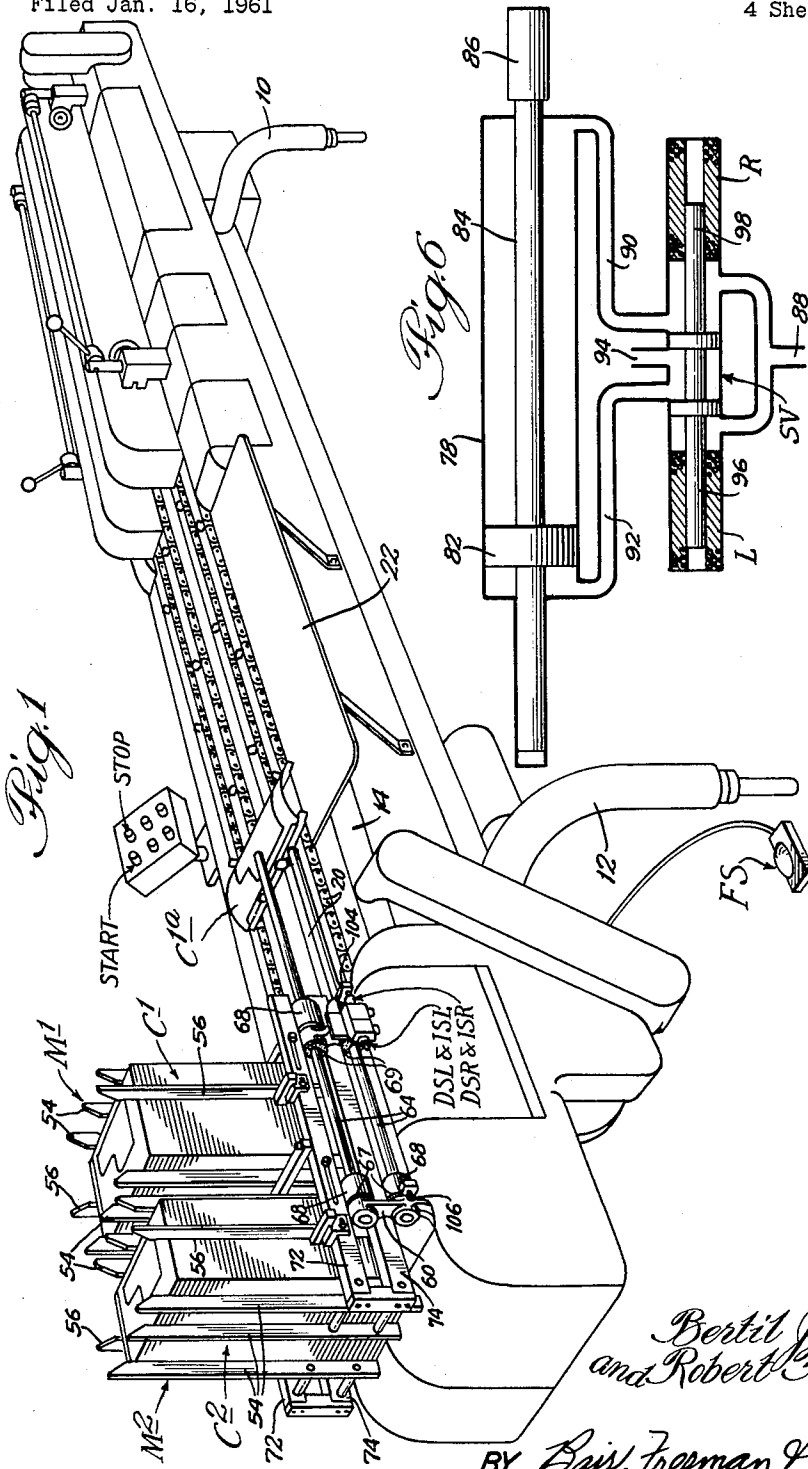


Fig. 1

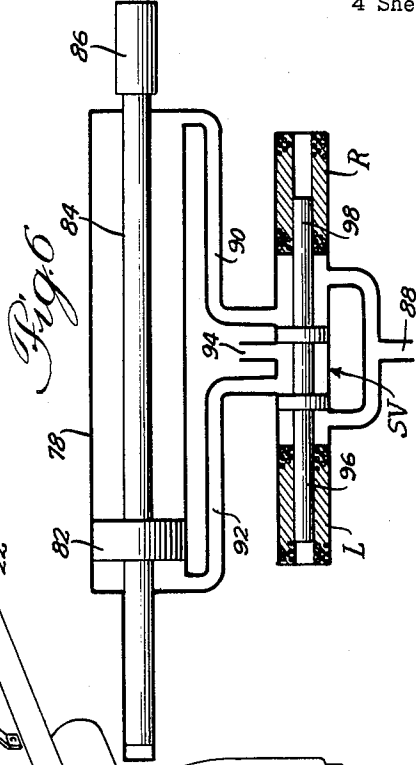


Fig. 6

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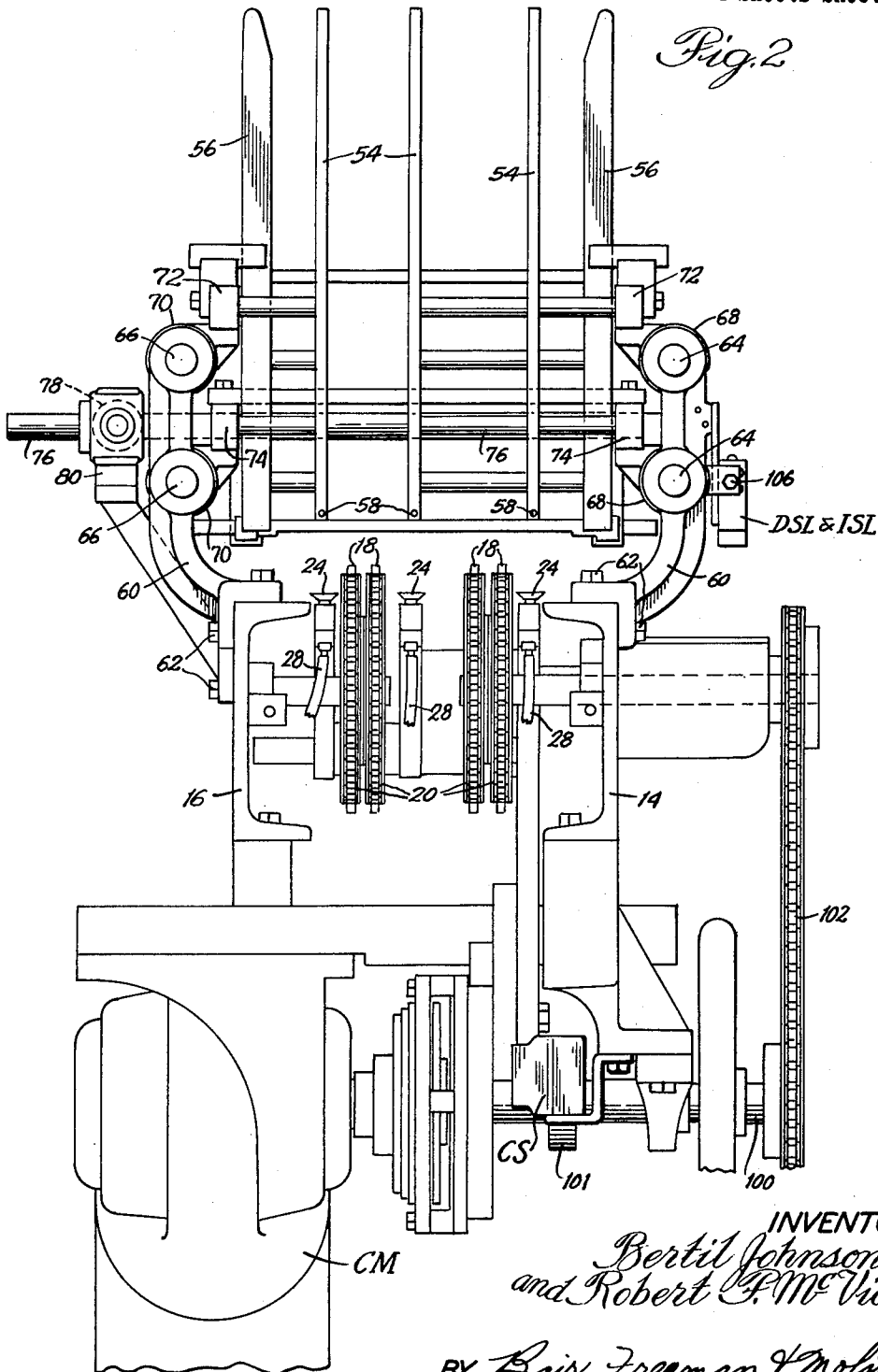
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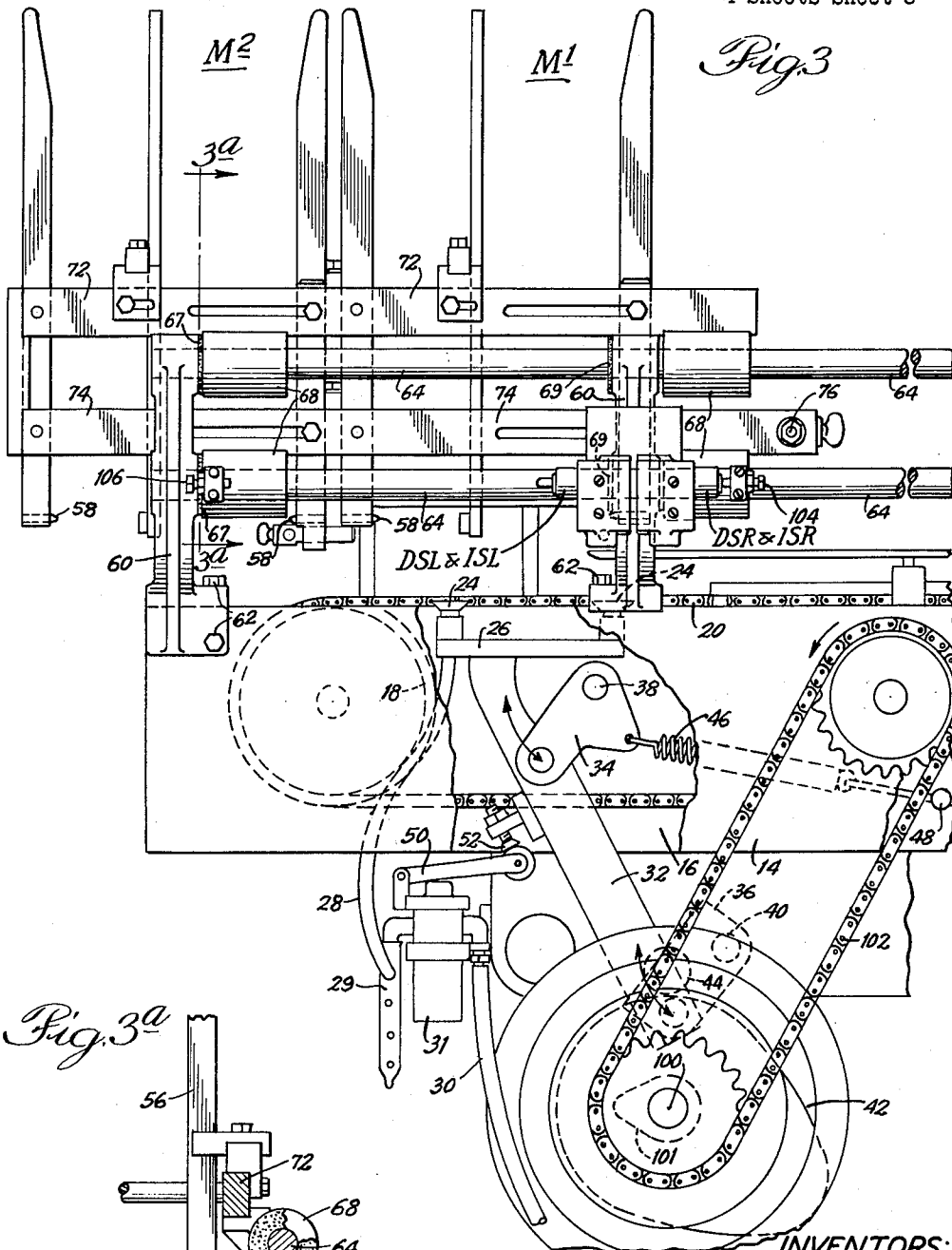
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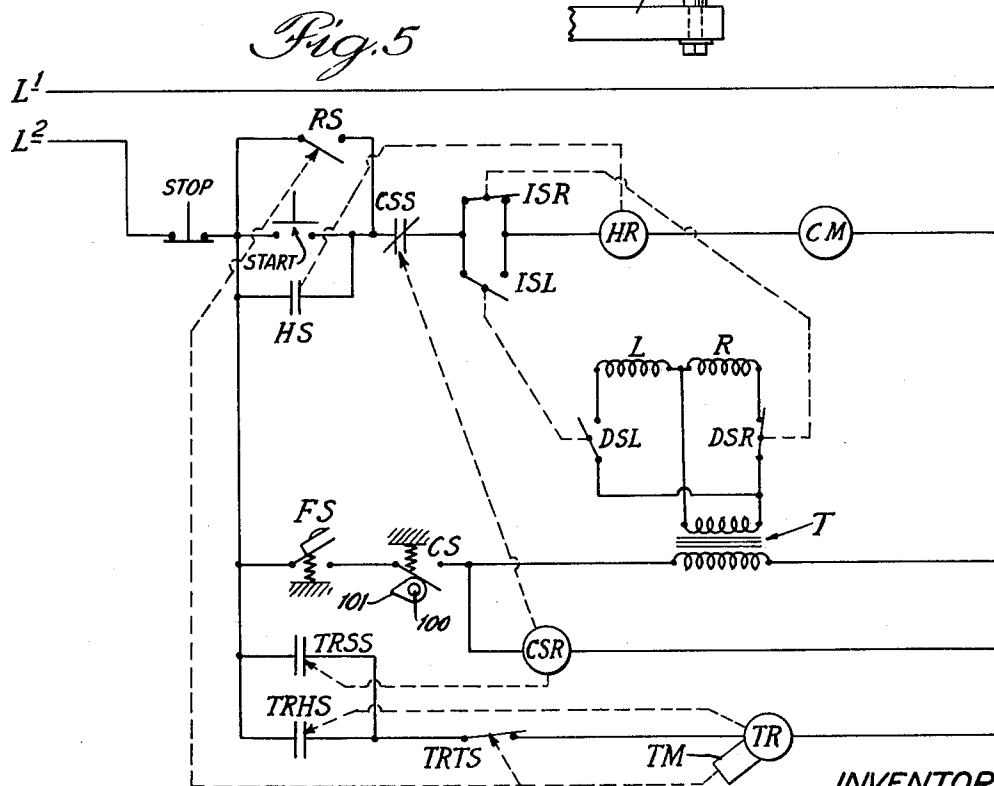
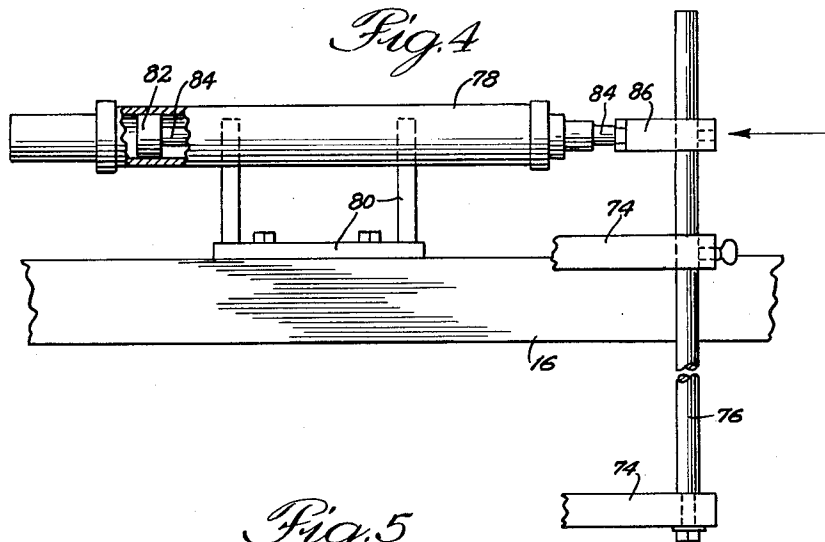
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4 Sheets-Sheet 4



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MULTIPLE MAGAZINE FOR CARTONING MACHINE

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12 Claims. (Cl. 53-168)

This invention relates to a multiple magazine arrangement for a cartoning machine such as one of the type shown in Patent No. 2,999,344.

One object of the invention is to provide at least two magazines which may contain different types of cartons, and which are movably mounted on the cartoning machine so that the cartons from either magazine can be selectively introduced to the cartoning machine as desired at the will of the operator. The cartoning machine such as shown in the co-pending application referred to may for instance be designed for cartoning bacon. Slabs of bacon are successively sliced and each slab produces two grades of bacon, some of the end slices being second grade as compared to the majority of slices between the end slices being first grade. It is desirable to package these different grades in different cartons and one way of doing it is to have a single magazine for cartons, loaded with first grade cartons and lay aside the second grade bacon until a considerable quantity has been accumulated, then load the magazine with second grade cartons and run through the accumulated batch. On the other hand, it would be desirable to accumulate only a few cartons of second grade bacon and have a quickly operable selective means for packaging only a few quantities of bacon in the second grade cartons and then switch back to first grade cartons.

The primary object of our present invention is to provide a multiple magazine for this purpose, together with a quickly operable selective means to switch from one magazine to the other while the machine is in operation without sacrificing more than approximately one cycle of operating time for the switching operation.

Another object is to provide at least a pair of magazines movably mounted on a cartoning machine so that either magazine may be moved to a position over carton removing means of the machine.

Still another object is to provide automatic mechanism for moving both magazines bodily with respect to the cartoning machine so that either magazine as desired is in position over the carton removing means which removes the cartons from the bottom of the stack of cartons one at a time and feeds them to the conveyor of the cartoning machine.

A further object is to provide such automatic means primarily under selective control of the operator and secondarily timed in relation to the cycles of operation of the cartoning machine so that magazine switching operation can be accomplished at an appropriate time during the cycle of operation of the machine.

Still a further object is to provide pneumatic means for shifting the magazines and an electric control circuit therefor in which the switching operation is initiated by a foot switch or the like, and then automatically performed and completed as to the cycle of switching operation whereupon the cartoning machine is restarted, having been stopped for the magazine switching operation.

An additional object is to provide a safety interlock arrangement in the circuit to prevent malfunctioning in the case of binding or jamming of the magazine shifting mechanism.

With these and other objects in view, our invention consists in the construction, arrangement and combination of the various parts of our multiple magazine for car-

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toning machine whereby the objects above contemplated are attained, as hereinafter more fully set forth, pointed out in our claims and illustrated in detail on the accompanying drawing wherein:

FIG. 1 is a perspective view of the type of cartoning machine shown in the co-pending application above referred to with our presently disclosed multiple magazine arrangement mounted thereon, our arrangement being illustrated by shaded lines to distinguish it from the machine in general shown in lighter and unshaded lines.

FIG. 2 is an end view of the left-end of FIG. 1 on an enlarged scale.

FIG. 3 is a side elevation of our multiple magazine and associated parts of the cartoning machine as viewed from the left side of FIG. 2 and the near side in FIG. 1.

FIG. 3^a is a vertical sectional view on the line 3^a-3^a of FIG. 3 showing only the magazine and supporting means therefor.

FIG. 4 is a plan view of a portion of FIG. 3 to show the pneumatic cylinder for our magazine switching operation.

FIG. 5 is a diagrammatic view of the electric circuit and associated components for controlling our magazine shifting mechanism; and

FIG. 6 is a diagrammatic view of the pneumatic magazine shifting mechanism and solenoid control valve therefor.

On the accompanying drawings we have used the reference numerals 10 and 12 to indicate respectively front and rear supporting legs for a cartoning machine. Longitudinal channels 14 and 16 shown in FIG. 2 form part of the framework of the machine and serve to support our multiple magazine as will hereinafter appear. As more fully disclosed in the co-pending application the machine includes conveyor chain sprockets 18 and conveyor chains 20 for conveying erected cartons such as shown at C¹ in FIG. 1 past a product shelf 22 on which product such as pounds of sliced bacon may be deposited from a slicing machine and manipulated by an operator to insert them into the erected cartons C¹ as they pass the shelf 22.

Our present invention involves the use of two magazines identified as M¹ and M², and as shown in FIGS. 1 and 3 the magazine M¹ is over a carton extracting mechanism of the type shown in the co-pending application and which will now be described briefly as to its features pertinent to an understanding of our invention. A plurality of vacuum cups 24 are mounted on supporting bars 26 and connected by hoses 28 to a manifold 29 which, in turn, is connected to a vacuum valve 31. A vacuum pump hose 30 extends from a vacuum pump (not shown) to the valve 31. The supporting arm 32 is pivoted to upper and lower parallelogram links 34 and 36 which, in turn, are pivoted at 38 and 40 to the frame of the cartoning machine. The links 34 and 36 are oscillated through arcs by a cam 42 engaging a roller 44 on the link 36, the roller being held in engagement with the cam by a spring 46 connected to the link 34 at one end and anchored at its other end to the frame of the machine as at 48.

The vacuum valve 31 is biased to open position, a pivoted lever 50 being provided to close it by depression of the lever as to the position shown in FIG. 3 by an adjustable projection 52 on the supporting arm 32. The vacuum valve is open during the major portion of the oscillation of the links 34 and 36 from their lowermost position.

The magazines M¹ and M² at the front or in-feed end of the cartoning machine (left hand end in FIG. 1) are for collapsed cartons C¹ and C², C¹ being the cartons for first grade bacon and C² the cartons for second grade bacon. Each magazine comprises three back uprights, three front uprights 54 and two side uprights 56 to hold

the cartons in vertical stacks as illustrated in FIG. 1 and permit feeding of the cartons one at a time from the bottom of whichever stack is over the vacuum cups 24 (the stack of cartons C¹ in FIGS. 1 and 3). The uprights 54 and 56 are suitably supported rigidly on the frame of the cartoning machine as will hereafter appear and at their lower ends they are provided with stop screws 58 forming rounded projections for supporting the edges of the cartons. It is obvious, however, that if the bottom-most carton is bowed downwardly it will be withdrawn from supported position on the projections 58. The magazines, as just described, are comparable in construction to the single (2) magazine disclosed in the Clanin and Hansen application.

We will now describe our mounting means for the two magazines M¹ and M² whereby they may be selectively positioned over the vacuum cups 24, and the mechanism and control means for accomplishing the selection as desired. Four brackets 60 are secured to the channels 14 and 16 by bolts 62. Each bracket has a pair of hubs whereby the two brackets on the channel 14 may rigidly support a pair of horizontal rods 64. Likewise, the two brackets 60 on the channel 16 rigidly support a pair of horizontal rods 66. The four rods 64 and 66 have rubber stop or bumper washers 67 and 69 thereon, four of the washers 67 adjacent the rear brackets 60 (see FIG. 3), and four of the washers 69 adjacent the front brackets 60. Four hub-like brackets 68 are slidable on the pair of rods 64 and four similar hub-like brackets 70 are slidable on the pair of rods 66. The brackets 68 as shown in FIG. 3 are adapted for supporting the right-hand sides of the magazines M¹ and M² in FIG. 2, while the brackets 70 are adapted to support the left-hand sides of the magazines. As shown in FIGS. 1, 2 and 3 the support includes upper longitudinally extending bars 72 and lower longitudinally extending bars 74 with which suitable rods and bars are connected, and in turn are connected to the uprights 54 and 55 as disclosed, the arrangement being such that the magazines are adjustable for different lengths and widths of collapsed cartons C¹ and C². Since these connections form no part of our present invention, we will not include a detailed description thereof.

The magazines M¹ and M² are shown in the rearward position in FIGS. 1 and 3 with the magazine M¹ over the vacuum cups 24. They may be slid forwardly on the rods 64 and 66 so that magazine M² instead is over the vacuum cups. The mechanism for accomplishing such sliding motion consists of a cross rod 76 adjacent to forward ends of the bars 74 (see FIG. 4), a pneumatic cylinder 78 supported on a mounting bracket 80, which is secured to the channel 16, a piston 82 in the cylinder and connected to a piston rod 84 extending from the right-hand end of the cylinder 78. The extending piston rod is operatively connected to the cross rod 76 by a connector 86.

A main shaft 100 (see FIG. 3) is rotated once per cycle of operation of the cartoning machine by the conveyor motor CM. The conveyor chain 20 is driven in synchronism with the main shaft 100 by a chain 102 and other operative connections (not here shown but disclosed in said Clanin and Hansen application). A cam 101 is mounted on the main shaft 100 for operating a cycling switch CS as shown in FIG. 5.

Referring to FIG. 6 a solenoid valve SV is provided for controlling the supply of compressed air to opposite ends of the cylinder 78. A compressed air supply 88 is shown extending to the valve SV and from the valve are air connections 90 and 92 to the front end and rear end respectively of the cylinder 78. 94 is an exhaust port from the valve. The solenoid coils are indicated L and R (for left and right respectively as will hereinafter appear), and solenoid plungers that enter the solenoid coils are shown diagrammatically at 96 and 98 respectively.

The basic electric circuit for controlling the solenoid coils L and R, as well as certain significant components

of the cartoning machine is shown in FIG. 5. The current supply is through lines L¹ and L², and normal circuit control elements for a conveyor motor CM consists of a "STOP" switch, a "START" switch, a holding relay HR having normally open contacts forming a holding switch HS. We have added the following elements to the basic circuit just described:

- (1) a re-start switch RS shunting the "START" switch
- (2) a conveyor stop switch CSS (normally closed) in the circuit of the conveyor motor CM
- (3) an interlock switch (right) ISR for the solenoid coil R and an interlock switch (left) ISL for the solenoid coil L which switches are normally open and shunt each other, and are connected in the circuit of the motor CM.
- (4) They are alternately closed by the magazines reaching their opposite limits of movement
- (5) a foot switch FS which is normally open and may be closed by stepping thereon. This switch is conveniently located for operation at will by the operator of the machine, for instance, at the position shown in FIG. 1 near the leg 12
- (6) a cycle switch CS to insure operation of our magazine switching mechanism only at the proper time in the cycle of operation of the cartoning machine. The cycle switch CS is normally open, and closed momentarily throughout a few degrees of rotation of the main shaft 100 by cooperation of the cam 101 with the switch CS
- (7) a step down transformer T for supplying low voltage current to the solenoid coils L and R. The transformer T and the foot switch FS and cycle switch CS are connected in series across the line L¹—L² so that FS and CS energize the transformer T only when both are closed
- (8) a direction switch (left) DSL and a direction switch (right) DSR in the circuits for the solenoid coils L and R respectively. The switches DSL and DSR are mechanically connected to the switches ISL and ISR for simultaneous opening in one position or closing in the opposite position. All four switches are normally open when the magazines are shifting from one position to the other but at the end of the shift the appropriate pair of switches is closed, such as the switches DSR and ISR in FIG. 3 due to a switch actuating screw 104 on the lower front bracket 68 striking the control button of the switch. For the switches DSL and ISL a similar stop switch actuating screw 106 is provided on the lower rear bracket 68.
- (9) a conveyor stop relay CSR energized in parallel with the transformer T, and when energized operable to open the normally closed conveyor stop switch CSS.
- (10) a timing relay start switch TRSS which is normally open and is closed by energization of the relay CSR
- (11) a timing relay holding switch TRHS which is normally open and shunts the switch TRSS
- (12) a timing relay time switch TRTS which is normally closed
- (13) a timing relay TR which is in circuit with the switches TRHS and TRTS across the line L¹—L². The switch TRHS is immediately closed whenever TR is energized whereas the timing relay TR has timing mechanism TM which at the end of a timing period momentarily opens and then closes the switch TRTS and simultaneously momentarily closes and then reopens the re-start switch RS.

After the cartoning machine magazines have been adjusted to the desired size of carton, they are loaded with cartons, C¹ for first grade bacon and C² for second grade bacon, the machine may be started by depressing the "START" switch shown in FIG. 5 to establish the circuit through the conveyor motor CM. Energization of the motor CM will rotate the main shaft 100 once each cycle of operation of the machine and the conveyor chain 20 will slowly advance while the vacuum cups 24 will alternately raise and lower once each cycle of operation. The vacuum cups contact the lowermost carton C¹ resting on the projections 58 of the magazine M¹ and since vacuum is applied to the cups by opening of the valve 31, soon

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after they leave their lowermost position the cups are supplied with vacuum to grip the lower surface of the carton for the purpose of pulling it downwardly when the cups again move downwardly. In moving downwardly the carton moves with the cups and is pulled off the projections 58 and partially erected as shown in the Clanin and Hansen application, being fully erected by the time they reach the position of the carton C^{1a} in FIG. 1 which is the loading station at which a pound of sliced bacon may be inserted by the operator into the erected carton. The carton at this point has its upper panel bowed upwardly to facilitate such insertion. The carton then moves on through the machine and its ends are closed as disclosed in the application referred to.

When it is desired to switch from cartoning first grade bacon to cartoning a batch of second grade bacon, the operator (while the machine is still running) steps on the foot switch FS. At that particular time the cycle switch CS may not be in closed position and accordingly the operator maintains his foot on the switch FS until CS does close and thereby the solenoid coil R is energized because of energization of the transformer T and the switch DSR being closed whereas the switch DSL is open.

The operator may then release the foot switch FS which will break the circuit of the transformer T and thereby de-energize the solenoid coil R but by that time the solenoid valve has been shifted from the position shown in FIG. 6 to the opposite position (toward the right) for sending air from 88 through 92 and exhausting it from 90 through 94. Accordingly, the piston 82 will shift toward the right and carry with it the magazines M¹ and M² and continue for a full stroke until the four rearward brackets 68 strike front bumper washers 69 and the magazine assembly will be held in that position by continued air pressure on the left side of the piston 82 in FIG. 6.

At the time the transformer T is energized the conveyor stop relay CSR is also energized as it is in parallel with the transformer T. This opens the conveyor stop switch CSS so that the conveyor motor CM is de-energized, thus stopping the normal operation of the cartoning machine while the magazine-shift operation is taking place. The conveyor stop relay CSR when energized also closes the timing relay start switch TRSS thus energizing the timing relay TR which thereupon immediately closes the timing relay holding switch TRHS to keep the timing relay in operation after the timing relay start switch TRSS is opened by de-energization of the conveyor stop relay CSR (energized only momentarily by the cycle switch CS). The conveyor stop switch CSS can reclose at this time, however, since the holding switch HS has been opened by de-energization of the holding relay HR when CSS was opened, thus insuring that the circuit for the conveyor motor CM will remain open until reclosed by the restart switch RS.

The timing mechanism TM is adjustably set for the time it requires for shift of the magazine assembly from one position to the other to insure full shift (usually two to three seconds) and when the time runs out the timing mechanism TM opens the timing relay timed switch TRTS to de-energize the timing relay TR and reset it for the next operation, and closes the restart switch RS to automatically re-energize the conveyor motor circuit without the operator having to depress the "START" switch. The switch TRTS recloses and the switch RS reopens by the timing mechanism TM timing out after the holding switch HS has closed. The two switches TRTS and RS are thereby reset for the next magazine shifting operation.

The momentary closing of the cycle switch CS obviously will energize either the solenoid coil R or the solenoid coil L depending on which of the switches DSR or DSL is closed. The opposite limits of travel of the magazine assembly may be considered "home" positions and only one of the switches DSL or DSR is closed at either of the home positions, both being open during the movement of the magazines from one position

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to the other. This switching arrangement reverses the solenoid valve SV to actuate the piston 82 in the proper direction. The interlock switches ISR and ISL being mechanically connected to the direction switches DSR and DSL operate in the same manner with both switches open when the magazine is off home position.

The timing mechanism TM of the timing relay TR is set at approximately two to three second to allow enough time for the magazines to move from one home position to the other home position. If for any reason such as binding or jamming of the magazine shifting mechanism so that it does not reach either home position the interlock switches ISL and ISR serve as safety switches to keep the conveyor motor CM deenergized until the trouble is remedied and thereupon automatic operation will be resumed to complete the movement to the selected home position after which the cartoning machine will start operating again and continue to do so until the foot switch FS is again depressed for switching to the other stack of cartons.

From the foregoing specification it will be obvious that we have provided a multiple magazine arrangement for a cartoning machine which removes collapsed cartons one at a time from either magazine, and a readily operable means for automatically accomplishing all operations necessary for the shift from one style of carton to the other by the mere closing of a foot switch for part of a cycle of operation of the machine. The only further requirement is that the foot switch be held depressed until the cycle switch CS closes which will start the movement of the magazines and as soon as they are observed in motion the foot switch can be released. During the shifting of the magazines the cartoning machine is stopped so that the vacuum cups 24 do not attempt to remove cartons while the magazines are being shifted and so that there are no empty pockets on the conveyor chain 20. Thus, there is minimum interference with the operation of the cartoning machine and likewise of the magazine shifting mechanism. In the electric circuit provision has been made for assuring completion of a magazine shifting operation once it is started and also provisions for guarding against any malfunctioning in case the magazines bind or jam before reaching home position.

While we have shown and described a twin magazine arrangement, it is obvious that a similar arrangement with three or more magazines could be designed, operated and controlled in a manner similar to our disclosure without departing from the spirit of our invention.

Some changes may be made in the construction and arrangement of the parts of our twin magazine arrangement without departing from the real spirit and purpose of our invention, and it is our intention to cover by our claims any modified forms of structure or use of mechanical equivalents which may reasonably be included within their scope.

We claim as our invention:

1. For use with a cartoning machine having means for withdrawing cartons one at a time from a magazine, a multiple magazine assembly movably mounted on the cartoning machine and adapted for any one of its magazines to selectively coact one at a time with said withdrawing means, manually controlled means for automatically moving said magazine assembly to a position of coaction between a desired magazine and said withdrawing means, said manually controlled means being operable while the cartoning machine is in operation for effecting stoppage of the cartoning machine at a predetermined position in its operating cycle during the magazine assembly moving operation, and means operable by the completion of the magazine assembly moving operation to effect continuance of operation of the cartoning machine.

2. For use with a cartoning machine having means for withdrawing cartons one at a time from a magazine, a multiple magazine assembly movably mounted on

the cartoning machine and adapted for any one of its magazines to coact one at a time with said withdrawing means, and selectively operable means for automatically moving said magazine assembly to a position of coaction between a desired magazine and said withdrawing means, for stopping the cartoning machine at a predetermined point in its cycle of operation and for starting it again when said desired magazine assumes its position of coaction with said withdrawing means.

3. For use with a cartoning machine having means for withdrawing carton one at a time from a magazine, a multiple magazine assembly movably mounted on the cartoning machine and adapted for any one of its magazines to selectively coact one at a time with said withdrawing means, pneumatic means for moving said magazine assembly to a position of coaction between a desired magazine and said withdrawing means, and manually controlled means for actuating said pneumatic means, said manually controlled means effecting stoppage of the cartoning machine at a predetermined point in its cycle of operation during the magazine assembly moving operation and restarting the cartoning machine at the completion of said magazine assembly moving operation.

4. For use with a cartoning machine having means for withdrawing cartons one at a time from a magazine, a two-position, twin magazine assembly movably mounted on the cartoning machine and adapted for either of its magazines to selectively coact one at a time with said withdrawing means, pneumatic means for moving said magazine assembly to a position of coaction between either magazine and said withdrawing means, and foot operated means for actuating said pneumatic means, said foot operated means automatically moving the non-coacting magazine to coacting position and effecting stoppage of the cartoning machine at a predetermined point in its cycle of operation during the magazine assembly moving operation and restarting the cartoning machine at the completion of said magazine assembly moving operation.

5. For use with a cartoning machine having means for withdrawing cartons one at a time from a magazine, a two-position, twin magazine assembly movably mounted on the cartoning machine and adapted for either of its magazines to selectively coact one at a time with said withdrawing means, pneumatic means for moving said magazine assembly to a position of coaction between a non-coacting magazine and said withdrawing means, a solenoid valve for controlling said pneumatic means, a circuit for said solenoid valve, a manual switch for controlling said circuit and thereby said solenoid valve and said pneumatic means, a cycling switch also controlling said circuit to delay operation of said solenoid valve and thereby said pneumatic means until a predetermined point in the operating cycle of said cartoning machine is reached, and means responsive to said manual and cycling switches for effecting stoppage of the cartoning machine during the magazine assembly moving operation.

6. For use with a cartoning machine having means for withdrawing cartons one at a time from a magazine, a twin magazine assembly movably mounted on the cartoning machine and adapted for either of its magazines to selectively coact one at a time with said withdrawing means, pneumatic means for moving said magazine assembly to a position of coaction between a desired magazine and said withdrawing means, a solenoid valve for controlling said pneumatic means, a circuit for said solenoid valve, a foot switch and a cycling switch in series with each other in said circuit for controlling the circuit and thereby said solenoid valve and said pneumatic means, said circuit effecting stoppage of the cartoning machine during the magazine assembly moving operation.

7. For use with a cartoning machine having means for withdrawing cartons one at a time from a magazine, a two-position, twin magazine assembly movably mounted on the cartoning machine and adapted for either of its magazines to selectively coact one at a time with said

withdrawing means, pneumatic means for moving said magazine assembly to opposite positions where one or the other of said magazines coacts with said withdrawing means, and manually controlled means for actuating said pneumatic means, said manually controlled means, when operated, automatically moving the non-coacting magazine to coacting position relative to said withdrawing means and also effecting stoppage of the cartoning machine at only one point in its cycle of operation during the magazine assembly moving operation.

8. For use with a cartoning machine having means for withdrawing cartons one at a time from a magazine and conveying them, a twin magazine assembly movably mounted on the cartoning machine and adapted for either of its magazines to selectively coact one at a time with said withdrawing means, pneumatic means for moving said magazine assembly, a solenoid valve for controlling the direction of travel of said pneumatic means and having two solenoids, a normally open direction switch in circuit with each of said solenoids, one of said direction switches being closed by said pneumatic means at one limit of its movement and the other thereof being closed thereby at the other limit of its movement, a manual switch for energizing whichever solenoid has its direction switch closed, a cycle switch in series with said manual switch to insure energization of a solenoid only at a particular point in the cycle of operation of the cartoning machine, a conveyor stop relay to stop the conveyor motor of the cartoning machine, a timing relay energized by said conveyor stop relay, a timed-out restart switch actuated by said timing relay for re-energizing said motor, said restart switch being closed at the end of the timing period of said timing relay, and interlock switches in circuit with said motor and paralleling each other, said interlock switches being opened and closed simultaneously with said direction switches.

9. For use with a cartoning machine having means for withdrawing cartons one at a time from a magazine and conveying them, a twin magazine assembly movably mounted on the cartoning machine and adapted for either of its magazines to selectively coact one at a time with said withdrawing means, pneumatic means for moving said magazine assembly, a solenoid valve for controlling the direction of travel of said pneumatic means and having two solenoids, a normally open direction switch in circuit with each of said solenoids, one of said direction switches being closed by said pneumatic means at one limit of its movement and the other thereof being closed thereby at the other limit of its movement, a manual switch for energizing whichever solenoid has its direction switch closed, a cycle switch in series with said manual switch to insure energization of a solenoid only at a particular point in the cycle of operation of the cartoning machine, a conveyor stop relay to stop the conveyor motor of the cartoning machine, a timing relay energized by said conveyor stop relay, and a timed-out restart switch actuated by said timing relay for re-energizing said motor, said restart switch being closed at the end of the timing period of said timing relay.

10. For use with a cartoning machine having means for withdrawing cartons one at a time from a magazine, a two-position twin magazine assembly movably mounted on the cartoning machine and adapted for either of its magazines to selectively coact one at a time with said withdrawing means, solenoid means for controlling the direction of travel of said magazine and having two solenoids, a normally open direction switch in circuit with each of said solenoids, one of said direction switches being closed by said magazine at one limit of its movement and the other thereof being closed thereby at the other limit of its movement, a manual switch for energizing whichever solenoid has its direction switch closed, a cycle switch to insure energization of a solenoid only at a particular point in the cycle of operation of the cartoning machine, and means to stop the cartoning machine at a

predetermined point in its cycle of operation while said magazine assembly is being moved from one of its positions to the other and for restarting the cartoning machine at the completion of the magazine assembly movement.

11. For use with a cartoning machine having means for withdrawing cartons one at a time from a magazine, a twin magazine assembly movably mounted on the cartoning machine and adapted for either of its magazines to selectively coast one at a time with said withdrawing means, pneumatic means for moving said assembly, a solenoid valve for controlling the direction of travel of said pneumatic means and having two solenoids, a normally open direction switch in circuit with each of said solenoids, one of said direction switches being closed by said pneumatic means at one limit of its movement and the other thereof being closed thereby at the other limit of its movement, a foot switch operable for energizing whichever solenoid has its direction switch closed, a cycle switch to insure energization of a solenoid only at a particular point in the cycle of operation of the cartoning machine, a conveyor stop relay operated by said foot and cycle switches to stop the conveyor of the cartoning machine, a timing relay energized by said conveyor stop relay, a timed-out restart switch actuated by said timing relay for restarting said conveyor, said restart switch being closed at the end of the timing period of said timing relay.

12. For use with a cartoning machine having means for withdrawing cartons one at a time from a magazine, a twin magazine assembly movably mounted on the car-

toning machine and adapted for either of its magazines to selectively coast one at a time with said withdrawing means, pneumatic means for moving said assembly, a solenoid valve for controlling the direction of travel of said pneumatic means and having two solenoids, a normally open direction switch in circuit with each of said solenoids, one of said direction switches being closed by said pneumatic means at one limit of its movement and the other thereof being closed thereby at the other limit of its movement, a switch for energizing whichever solenoid has its direction switch closed, a conveyor stop relay controlled by said switch to stop the conveyor of the cartoning machine by de-energizing the conveyor motor thereof, a timing relay energized by said conveyor stop relay, and a timed-out restart switch actuated by said timing relay for re-energizing said motor.

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