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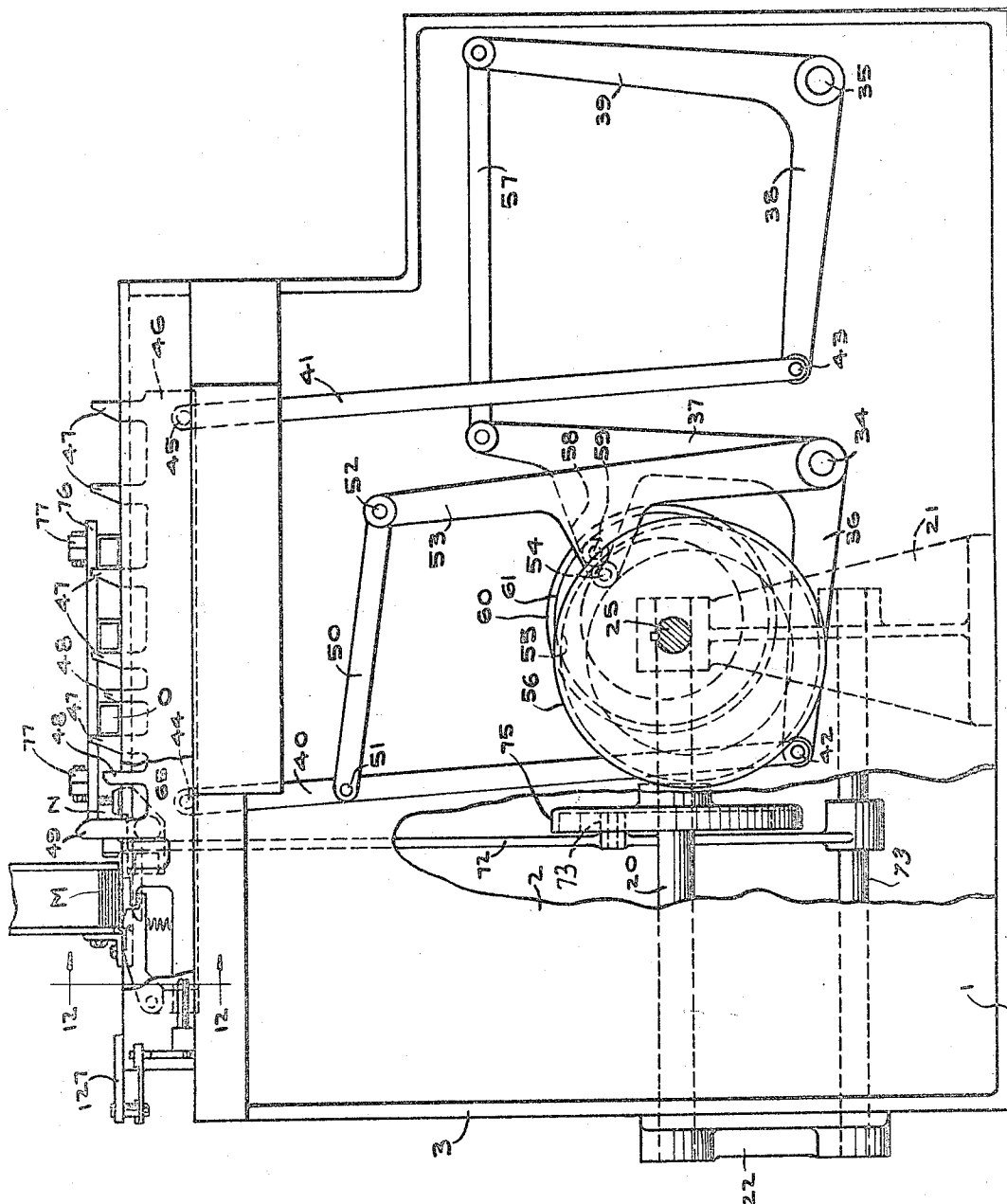
M. J. MILMOE

2,029,935

CARTON FEEDING MECHANISM

Filed Dec. 22, 1930

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INVENTOR.

Michael J. Milmo
BY Chas. M. Nissen
ATTORNEYS.

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Y Chas. M. Nissen
ATTORNEYS.

ATTORNEYS.

Feb. 4, 1936.

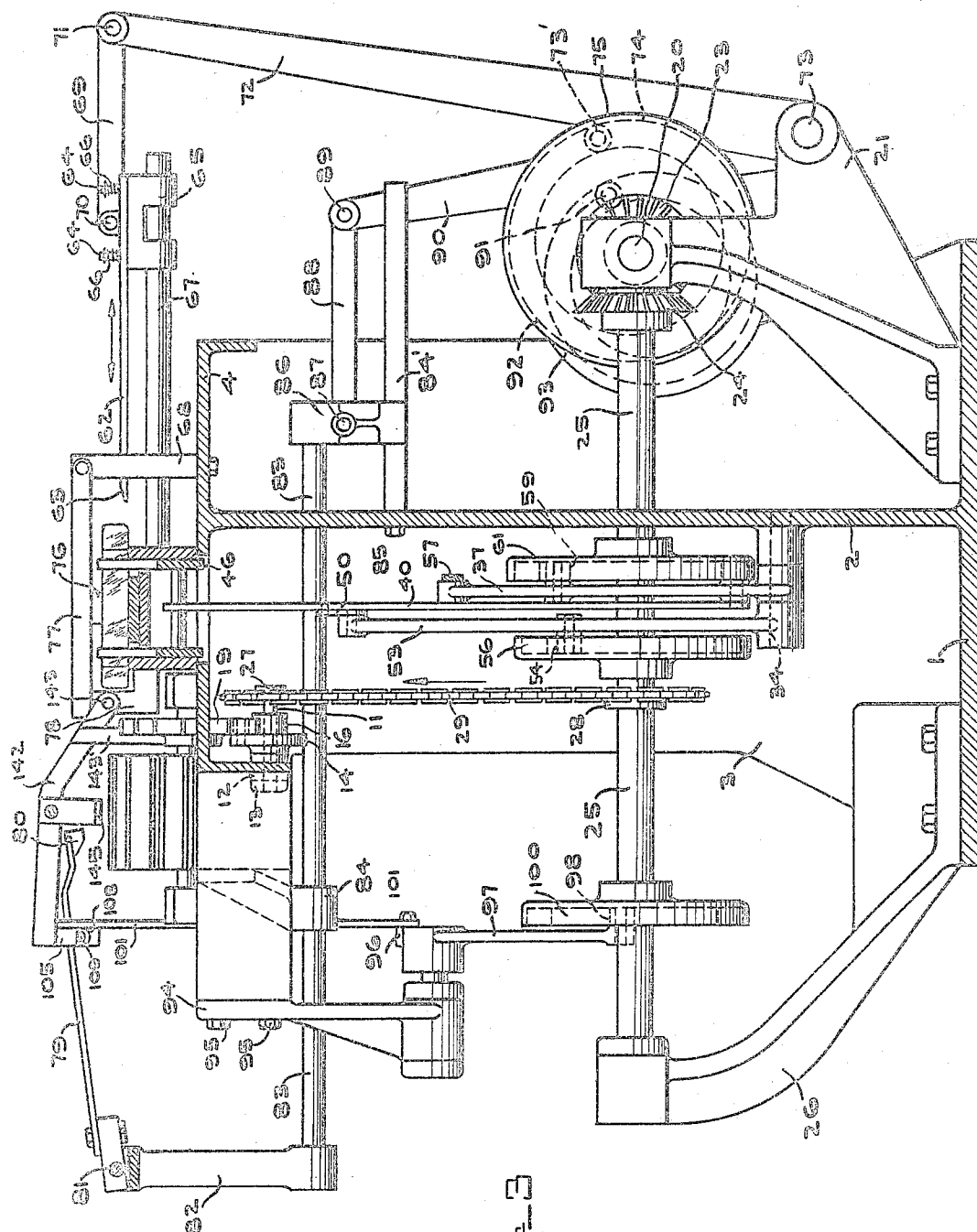
M. J. MILMOE

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CARTON FEEDING MECHANISM

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7 Sheets-Sheet 3



INVENTOR.

Michael G. Milmo
BY Chas. M. Nissen
ATTORNEYS.

BY *Chas. M. Nisner*

ATTORNEYS.

Feb. 4, 1936.

M. J. MILMOE

2,029,935

CARTON FEEDING MECHANISM

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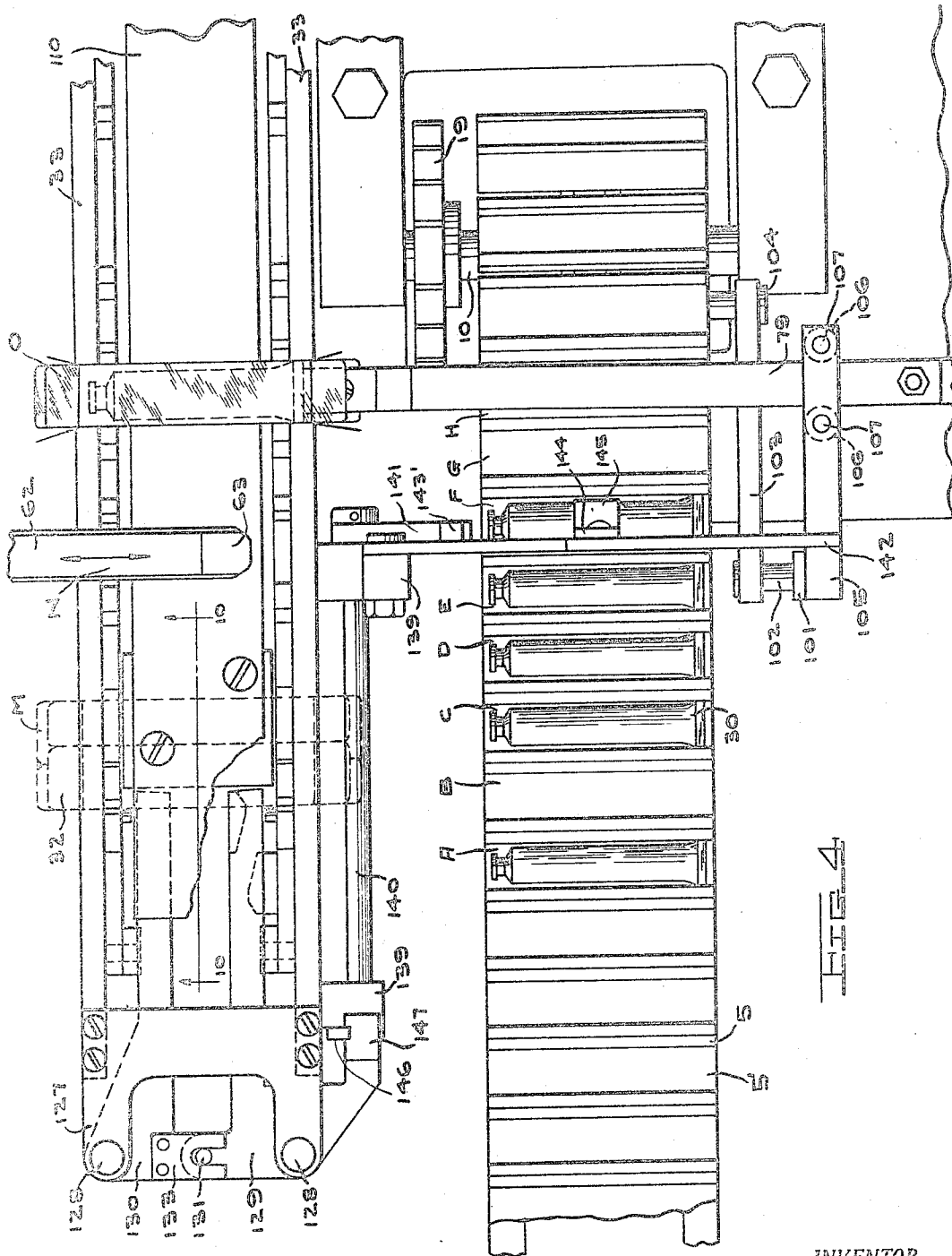


FIG. 4

INVENTOR.

Michael J. Milmoe
BY Chas. M. Nissen
ATTORNEYS.

Feb. 4, 1936.

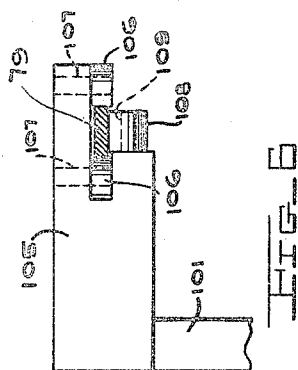
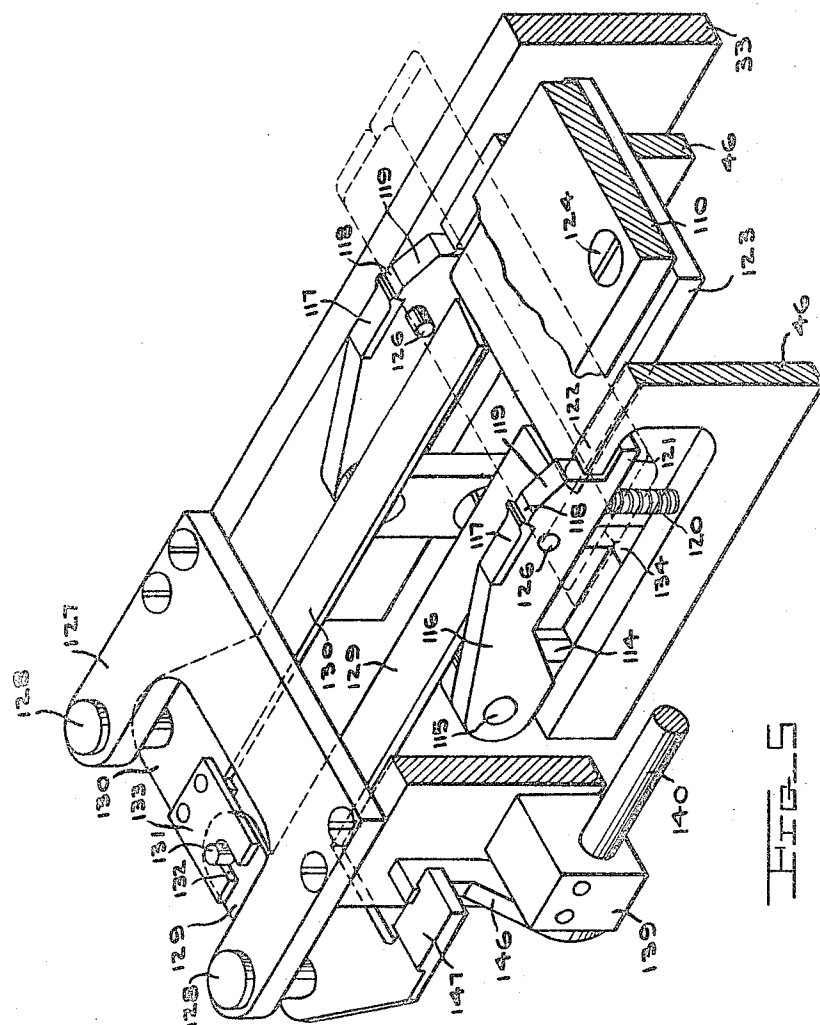
M. J. MILMOE

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CARTON FEEDING MECHANISM

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7 Sheets-Sheet 5



INVENTOR.
Michael J. Milmoe
BY Chas. M. Nissen
ATTORNEYS.

Feb. 4, 1936.

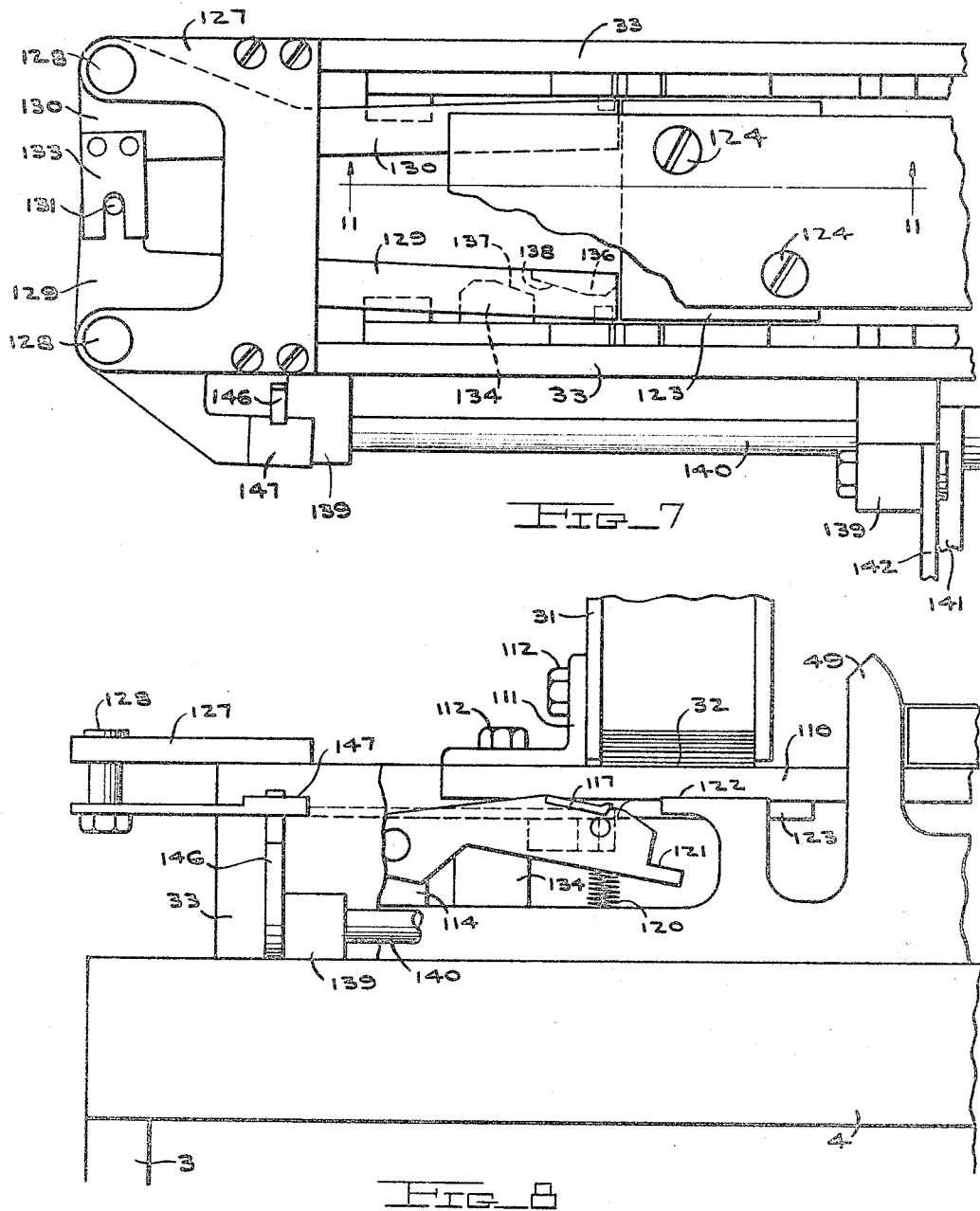
M. J. MILMOE

2,029,935

CARTON FEEDING MECHANISM

Filed Dec. 22, 1930

7 Sheets-Sheet 6



INVENTOR.
Michael J. Milmo
 BY *Chas. M. Nissen*
 ATTORNEYS.

Feb. 4, 1936.

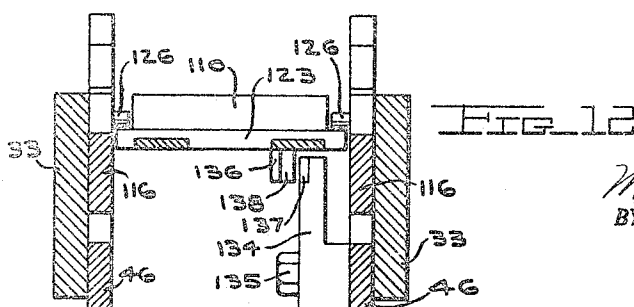
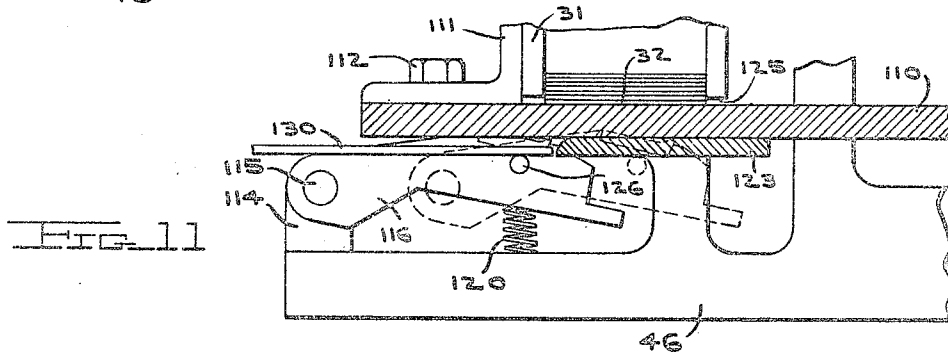
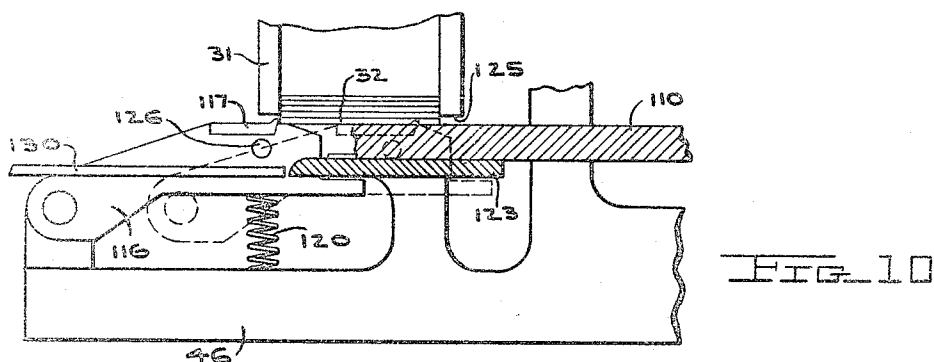
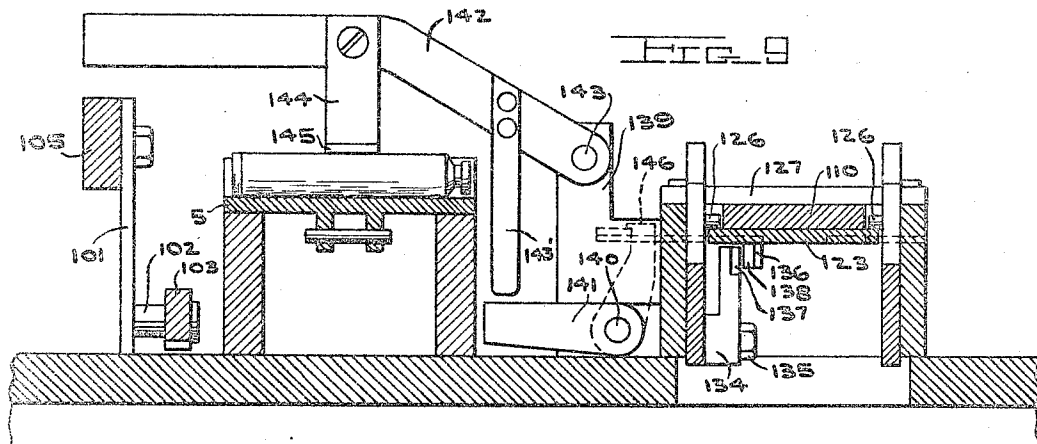
M. J. MILMOE

2,029,935

CARTON FEEDING MECHANISM

Filed Dec. 22, 1930

7 Sheets-Sheet 7



INVENTOR.
Michael G. Milnor
BY
Chas. M. Nissey
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,029,935

CARTON FEEDING MECHANISM

Michael J. Milner, Chicago, Ill., assignor to F. B. Redington Co., Chicago, Ill., a corporation of Illinois

Application December 22, 1930, Serial No. 503,986

26 Claims. (Cl. 228—2)

The present invention relates to cartoning machines in which an article is positioned within an opened carton and the ends of the carton thereafter sealed or closed, either by gluing or by tucking in the flaps which are usually provided at the end of the carton. My present invention relates to the means for feeding the cartons to the article receiving position, and it will be understood that the ends of the carton may be sealed in any desired manner, as that does not constitute a part of the present invention.

It sometimes happens that the articles being fed to the loading position do not form a continuous series. If the articles are being positioned in pockets of a continuous chain, it quite often happens that a pocket is missed so that when the loading position is reached, there is no article to be fed from the pocket into the carton waiting at that position. However, the machine would keep on operating and the result would be that an empty carton would pass through the machine and have its ends sealed perhaps without coming to the attention of the operator. Even if this is noticed by the operator, it means that a carton is wasted, and of course if a number of pockets are empty, it means a waste of a corresponding number of cartons to say nothing of the possibility of having empty cartons sold to a customer.

In order to avoid these and other disadvantages, my present invention contemplates feeding the cartons in such a manner that cartons will only be fed to a loading position if and when an article is at the loading position to be moved into the carton.

More particularly my invention contemplates the temporary interruption of the carton feed if and when a pocket is found to be empty, so that when the pocket arrives at the loading position, there will be no carton at that position, and consequently, there is no waste and there is no possibility that an empty carton will be sealed and shipped to the customer.

Another object of my invention is to resume the feeding of the cartons automatically after the temporary interruption. In other words, it is not necessary to again start the machine as the carton feeding means will only be rendered inoperative if and when a pocket is empty.

A still further object of my invention is to insure that whenever an article is presented at the loading position, a carton will be at said position to receive the article even though there has been a previous interruption of the feeding of the cartons.

In machines of this nature, the articles as well as the cartons are ordinarily fed toward the carton filling position in timed relation with each other so as to bring a carton and an article at the filling or loading position at substantially the same time. Now if it happens that a single article is missing from a series, then the corresponding cartons which would be normally fed into the loading position to receive that article in the series, will not be fed to the loading position until the next succeeding article in that series is presented at the loading position.

Other objects of this invention will appear hereinafter as the description of this invention proceeds, the novel combinations and arrangements of parts being clearly set forth in the appended claims.

In the drawings—

Fig. 1 represents a front elevational view, with parts broken away, of a machine embodying my invention;

Fig. 2 is a front elevational view similar to Fig. 1 only showing a number of the parts which are missing in Fig. 1;

Fig. 3 shows a cross-section of my machine taken substantially along the line 3—3 of Fig. 2;

Fig. 4 is a plan view of the mechanism shown in Fig. 2 with the hopper and other parts of the mechanism removed for the sake of clearness;

Fig. 5 is an isometric view of the means for feeding cartons out of the hopper, the hopper not being shown in this figure;

Fig. 6 is a detail of part of the mechanism shown in Figs. 1 to 4 inclusive;

Fig. 7 is a plan view of the mechanism used for feeding the cartons out of the hopper;

Fig. 8 is an elevational view of the means for feeding the cartons out of the hopper;

Fig. 9 is a section taken substantially along the line 9—9 of Fig. 2;

Fig. 10 is a section taken substantially along the line 10—10 of Fig. 4;

Fig. 11 is a section taken substantially along the line 11—11 of Fig. 7; and

Fig. 12 is a cross-section taken substantially along the line 12—12 of Fig. 1.

Referring now more particularly to Figs. 1 to 4 inclusive, it will be noted that the parts of my machine are supported on a base 1 having an upstanding web portion 2, lateral bracing webs 3, and an upper supporting table 4. The parts 2, 3, and 4 carry substantially all of the operating parts of the machine, suitable brackets being added here and there in order to support various

of the rotating parts necessary for the proper operation of the machine.

The machine illustrated in the drawings operates substantially in the same manner as the machine shown in my application Serial No. 356,933 filed April 22, 1929, for a carton filling machine.

In the present embodiment of my invention however, I have shown an intermittent drive for the chain which carries the articles, whereas in my co-pending application I have shown means for continuously moving the chain. It is to be understood that I do not wish to limit my invention to an intermittent drive for the chain as the invention is equally applicable to machines in which the chain which carries the articles is fed with a continuous motion, the continuous motion being either accelerated and decelerated as in Serial No. 356,933, or a uniform motion if desired.

The conveyor which carries the series of articles comprises a plurality of members 5 having pockets 5' therein connected together by means of the links 6, the members 5 acting also as links of the chain which forms the endless conveyor. The conveyor travels over the sprockets 7 and 8 mounted on the shafts 9 and 10 respectively. As best illustrated in Figs. 2 and 3, the shaft 10 has secured thereto a Geneva gear 19. Just below the shaft 10, is a short stub shaft 11 rotatably mounted in a bearing 12 and prevented from longitudinal movement by means of the collar 13 and disk 14 secured to the stub shaft. A pin 15 is mounted on the disk 14 and is adapted to enter the notches 15 in the Geneva gear in a well known manner. The shaft 10 also has a member 16 secured thereto which is adapted to enter the curved recesses 17 in the outer periphery of the Geneva gear. This is a common form of Geneva gear, and the operation thereof need not be described further, except to say that when the shaft 11 is given a continuous movement of rotation, this motion is imparted to the shaft 10 as an intermittent motion through means of the pin 15 and notches 15.

The main driving shaft 20 is carried by means of the brackets 21 and 22 secured to the base 1 and web 3 respectively. A beveled gear 23 secured to the shaft 20 meshes with a beveled gear 24 secured to the shaft 25 which is rotatably mounted in the bracket 21 and the bracket 26, and passes through the web 2 of the machine. Therefore, rotation of the main drive shaft 20 will rotate the shaft 25. A chain 29 is trained over the sprockets 27 and 28 secured to the shafts 11 and 25 respectively. As the shaft 20 rotates with a continuous motion, this continuous motion is imparted to the shaft 25 and also to the shaft 11 which in turn causes the shaft 10 to turn intermittently, thereby giving an intermittent movement to the conveyor in a direction from left to right as viewed in Fig. 2.

As the conveyor moves from left to right in Fig. 2, the pockets are filled with articles which are to be placed into cartons. These articles are indicated by the reference numeral 30, and in the present instance are tubes of tooth paste, shaving cream or the like, but it will be understood that my invention is not limited to such articles. For convenience in describing my invention, I have indicated the positions of various ones of the pockets by the letters A, B, C, D, E, F, G, and H, the latter position being the position at which the article is removed from the pocket. The intermittent movement of the con-

veyor advances each pocket to the next succeeding position. That is, the pocket at F moves to G, etc.

The cartons to be filled are stacked in folded position in the hopper 31, and are indicated by 5 the reference numeral 32. These cartons are adapted to be fed along the supporting guides 33 which are in spaced parallel relation with each other and with the conveyor for the articles. Before proceeding with a description of the mechanism for feeding the cartons out of the hopper along the guides, I will describe the manner in which the cartons are fed along the guides and are "squared". This means is perhaps best illustrated in Figs. 1, 2, 3, and 4, with particular reference to Figs. 1 and 3.

Two parallel stub shafts 34 and 35 each carry a bell-crank. The bell-crank on the stub shaft 34 has the arms 36 and 37 and the bell-crank on the stub shaft 35 has the arms 38 and 39. The arms 36 and 38 have the links 40 and 41 pivoted thereto at 42 and 43 respectively so that the rocking of the bell-cranks will cause vertical movement of the links 40 and 41. The links 40 and 41 are rotatably mounted on the pins 44 and 45 which, as is best illustrated in Fig. 3, connect the opposed parallel transport members 46. Each of these transport members carries a plurality of upwardly extending fingers 47, 48, and 49, all of these projections extending in substantially the same direction, but being of various heights.

In addition to the upward and downward movements imparted to the transport members 46 by means of the links 40 and 41, mechanism is provided for moving the links 40 and 41 horizontally to thereby move the transport members 46 horizontally, the resulting movement of the transport members being a compound movement which causes the transport members to move in a substantially closed path which somewhat resembles a rectangle. The path of movement of the transport is first to the right while in its highest position, then downward, then to the left and finally upward again to bring the transport into a position to again begin its cycle of movements. The means for imparting the lateral movement to the links 40 comprises a link 50 pivoted at 51 to the link 40 and at 52 to the arm 53 pivoted at 54 and carrying the roller 55 operating within a cam groove 56 of a cam 56. The cam 56 is so designed as to cause a rocking movement of the arm 53 in a substantially horizontal direction, thereby imparting a corresponding movement to the links 40 and 41.

In order to rock the bell-cranks in unison with each other, I connect the upper ends of the arms 37 and 39 by means of the link 57. The arm 37 carries an extension 58 having a roller 59 thereon traveling in a cam groove 60 in the cam 61. The cams 56 and 61 are secured to the shaft 25 and rotate in unison therewith. The cams 56 and 61 are so designed as to impart the above mentioned movements to the links 40 and 41 and to the transport members 46.

In Figs. 3 and 4, may be seen a part of the carton opening mechanism. This comprises a blade 62 having a forward beveled surface 63. This blade has openings therein through which the pins 64 on the block 65 protrude. Springs 66 surround the pin 64 yieldingly holding the blade 62 in engagement with the block 65. The block 65 slides along a guide bearing 67 secured to the guide 33. A link 69 pivoted at 70 to the sliding block 65 and at 71 to an arm 72 which in turn is pivoted to the shaft 73, is adapted to transmit

the motion of the arm 12 to the sliding block 65, and consequently to the blade 62. The arm 12 is provided with a roller 13' which travels in a cam slot 74 in the cam 75. The cam 75 imparts a rocking movement to the arm 12 and this rocking movement is changed into a rectangular reciprocating movement for the blade 62.

In Fig. 4, I have shown a carton 32 in dotted lines at the upper left in that figure. This dotted line position 32 represents substantially the position which the lowermost carton occupies while in the hopper. This carton is moved to the right into a position approximately half way between the carton shown in dotted lines and the carton shown in full lines in that figure, or at the position shown for the blade 62. The direction of reciprocation for the blade 62 is indicated by the double-headed arrow thereon. When the carton 32 moves to the first position out of the hopper, the blade 62 would be in a position out of the path of movement of the carton, but as soon as the carton is moved to that position, the blade moves forward and enters the folded carton to partially expand the same in a manner which is quite well known in the art to which this invention pertains, and which is more fully described in my co-pending application, Serial No. 356,933. As the blade 62 enters the carton, the transport moves upward, and the projections 49 and the adjacent projections 48 engage the carton and "square" the same so that the carton is now ready to receive the article, it being understood of course, that the blade 62 is withdrawn after the carton is "squared" or even slightly before it is "squared". As best illustrated in Figs. 1, 2, and 3, a bar 76 is carried by a plurality of arms 77 pivoted to the support 68. The outer ends of the arms 77 rest (as best illustrated in Figs. 2 and 3) on the upper ends of the brackets 78 so as to limit the downward movement of the bar 76. The bar 76 rests on the upper surfaces of the cartons 32 and holds them in squared relation as there is a possibility that the cartons will collapse while the projections on the transport members are out of engagement with the cartons. After the carton is first "squared" by means of the projections 49 and 48 and blade 62, the transport moves downward and to the left as viewed in Fig. 1, and the third and fourth projections on each of the transport members 46, counting from left to right, are moved into position on opposite sides of the opened carton as the transport moves upward, and as the transport members move to the right, the carton is carried to the next position which is the carton loading position.

In order to better describe my invention, I have indicated the position of the carton in the hopper as position M, the position at which the carton is squared as N and the position at which the carton is filled as O. This latter position is what will hereinafter be referred to as the loading position. After the carton has been filled at the position O, the same is carried on to successive positions further along the guide members 33 by means of the projection 47 on the transport members 46. At these latter positions suitable means may be provided for folding or sealing the flaps of the carton, for instance as in my co-pending application No. 356,933.

The articles at the position H are ready to be ejected into the carton at the position O, and for this purpose I provide an ejector located adjacent the conveyor at the position H. This ejector is indicated by the reference numeral 79 and

has a head 80 secured to the free end thereof, the other end being pivoted at 81 to an upwardly extending bracket 82 carried by a rod 83 slidable in a bearing in the bracket 84' and in the web 2. A guide rod 84 is secured to the web 2 by means of a bolt 85. A member 86 secured to one end of the rod 83 and having its lower end guided by the rod 84 is pivotally connected at 87 to a link 88, and this link in turn is pivoted at 89 to an arm 90, rotatably mounted on the shaft 73 and having a cam roller 91 engaging within a cam groove 92 in the cam 93. As the arm 90 is rocked by means of the cam 93, reciprocating movement is imparted to the rod 83 and to the ejector 79 as is best illustrated in Fig. 3.

As the ejector is moved into the pocket 5' at the position H, it engages the end of the article 30 and moves the article into the carton 32 at the position O. However, due to the intermittent movement of the conveyor for the articles, it is necessary that the ejector be raised clear of the conveyor on its return movement to the left as viewed in Fig. 3. I accomplish this result in the following manner:

A bracket 94 is secured by means of the bolts 95 to the table 4 at the front side thereof, and this supports a bell-crank having the arms 96 and 97 respectively. The arm 97 carries a roller 98 at the end thereof, and this roller engages within a cam groove 99 in the cam 100 which is secured to the shaft 25. The arm 96 of the bell-crank is pivoted to a link 101. The link 101 is pivoted at 102 to a second link 103 pivoted at 104 to the table 4. This link 103 acts to guide the member 101 during its vertical movement. As best illustrated in Figs. 3, 4, and 6, the upper end of the link 101 carries a horizontal member 105 having the guide rollers 106 journaled on the vertical pivots 107 and a guide roller 108 journaled on the horizontally disposed pivot 109. The ejector 79 rests on the roller 109, and has opposite vertical sides thereof engaged by the rollers 106 so as to permit free movement of the ejector 79 relative to the horizontal member 105.

The cam member 100 is so designed as to rock the bell-crank operated thereby, in a clockwise direction as viewed in Fig. 2, as the ejector begins its return movement to the left as viewed in Fig. 3, thereby causing an upward movement of the link 101, and as a result, an upward movement to the free end of the ejector. The ejector is raised sufficiently to clear the conveyor and the articles in the conveyor.

The mechanism which I have so far described is substantially the same as that described in my co-pending application, Serial No. 356,933, and I also use substantially the same method of stripping the cartons from the hopper and for moving them into a position to be "squared" by means of the projections 49 and 48 and by the blade 62. However, the stripping mechanism is provided with means for rendering the same inoperative at certain times when an article is missing from one of the pockets in the conveyor.

In Fig. 4, it will be noted that an article is missing from the pocket G, and therefore, no carton appears at the position N since when the pocket at G arrives at the position H, it is desired that no carton be at the position O. My invention contemplates means for insuring that this will result whenever an article is missing from one of the pockets and the machine is so designed as to prevent the feeding of the carton which would normally have received an article from the

pocket which is empty, had that pocket been filled.

I will first describe the stripping means and the manner in which it strips the carton from the hopper. The cartons themselves rest upon a horizontally disposed member 110 to which the hopper 31 is secured by means of the bracket 111 and bolts 112. The bracket 111 is wide enough to rest on the guide rails 33 so as to support one end of the member 110, the other end being supported by means of a bracket 113 shown at the right in Fig. 2. I will refer now more particularly to the showing in Figs. 1, 4, 5, 9, and 10. It will be noted in these figures that the transport members 48 are provided with upwardly extending bearing brackets 114 and pivot pins 115 which carry the arms 116 to which the stripping members 117 are secured. The forward edges of the stripping members 117 project above the horizontal surfaces 118 an amount which is not more than the thickness of one carton. The arms 116 have sloping surfaces 119 communicating with the surfaces 118 to guide the cartons onto the surfaces 118 and against the stripping members 117. Springs 120 are interposed between the arms 116 and transport members 48 in order to normally urge the arms upward. Projections 121 and 122 on the arms 116 and transport members 48 respectively, limit the upward movement of the arms 116.

A cam member 123 best illustrated in Figs. 5, 9, and 10 is secured to the underside of the support 110 by means of the screws 124 (Fig. 5) or the like. It will be noted from an inspection of Figs. 5 and 9 that the cam member 123 projects beyond the sides of the support 110, and it will be seen from an inspection of Fig. 10, that the left hand end of the cam member 123 is curved at the upper side thereof.

The normal operation of the stripping mechanism is as follows: When the transport moves upwardly it is brought into the position illustrated in Fig. 10 or rather to a position slightly to the left of that shown in Fig. 10 or that shown in Fig. 1. The transport then moves toward the right and as it does this, the lowermost carton in the hopper rides up over the beveled surfaces 119 onto the surfaces 118 and the stripping members 117 engage the edge of the carton and move the same out of the carton through the opening 125 in the front of the hopper as is best illustrated in Fig. 9 or in Fig. 1. This movement of the stripping members causes the carton to be fed to the position N at which position the carton is "squared" as previously described. Arms 116 are provided with pins 126 on their opposed faces, and these ride over the upper surface of the cam member 123 as is quite clearly illustrated in Figs. 9 and 10. This prevents the arm from moving downwardly and insures that the stripping members 117 will always be maintained in abutting relation with the edge of the carton as the carton is being moved out of the hopper. At the same time, if the carton is belled upwardly, the springs 120 will urge the arms 126 upwardly to keep the stripping members always against the carton which is second from the bottom. Otherwise the stripping members 117 may come out of contact with the lowermost carton and prevent the feeding of the carton out of the hopper.

It will readily be seen that if the stripping members 117 are rendered inoperative, the cartons will not be fed from the hopper, and in order to render the stripping members 117 inoperative, I provide means for preventing the movement

of the arms 116 to as high a position as is illustrated in either Figs. 1, 9 or 10. This means includes mechanism for insuring that the pins 126 instead of travelling over the cam 123, will travel under the cam 123 as is illustrated in Figs. 7, 8, and 11.

The guide members 33 are secured together by means of a plate 127 having the downwardly extending pivots 128. One of these pivots 128 carries an arm 129 and the other carries an arm 130, these arms rotating about their respective pivots in opposite directions due to the pin 131 on the arm 129 which operates in the slot 132 of the plate 133, the latter being secured to the arm 130. The arms 129 and 130 are arranged between the arms 116 and when in the position shown in Figs. 4, 5, and 9, are substantially parallel with each other, and as is very readily seen in Fig. 4, the arms in this position are not in the paths of movement of the pins 126, but will permit the pins to move the full extent of their upward travel, thereby causing the cartons to be fed out of the hopper as the transport moves to the right.

When the arms however, are rocked into the position shown in Fig. 7, by giving a clockwise movement to the arm 129, and a counter-clockwise movement to the arm 130, the ends of these arms are then in a position to engage the pins 126 as they move upwardly and thereby limit the upward movement of these pins, and consequently the upward movement of the arms 116.

While the transport always moves to the same upper elevation, the arms will not move to the same upward position when the arms 129 and 130 arrest the movement of the pins 126 as then the arms 129 and 130 are out of the paths of movement of the pins 126. The lower surfaces of the arms 129 and 130 are substantially in alignment with the under surface of the cam 123 as is quite clearly illustrated in Figs. 8 and 11. Consequently, when the pins strike the under sides of the arms 129 and 130, the pins are arrested at a position in the same horizontal plane as the under side of the cam 123. Therefore, as the transport moves to the right in Figs. 8 and 11, the pins 126 will move under the cam 123 and the stripping members 117 are therefore carried along with the transport at positions remote from the lowermost carton in the hopper. Consequently, no carton is stripped from the hopper whenever the arms 129 and 130 are in the positions shown in Figs. 7, 8, and 11.

Means which will presently be described, are provided for moving the arms 129 and 130 to the positions illustrated in Figs. 7 and 8, if and when the pocket which is adapted to carry the article to be fed into the next carton due to be removed from the hopper is empty. However, it is desired that upon the next stroke of the transport, the stripping members 117 be again rendered operative, providing, of course, that the next pocket has an article therein. Therefore, as the transport moves forward, suitable cam mechanism mounted on one of the transport members, and the adjacent arm co-operate to return the arms 129 and 130 to the positions illustrated for those arms in Fig. 4. This cam mechanism is perhaps best illustrated in Figs. 4, 7, 9, and 12, and comprises a member 134 secured by a bolt 135 to the transport member 48 and a member 136 on the under side of the arm 129. These members have co-operating cam surfaces 137 and 138 respectively. As the transport member moves to the right, the co-operating surfaces 137 and 138 come into engagement with each

other and cause the arm 129 and arm 130 to rotate from the position shown in Fig. 7 to that shown in Fig. 4. Of course when the arms are in the position shown in Fig. 4, the pins 126 can no longer engage these arms as the transport moves upward and as a result, the next movement of the transport member will cause the feeding of a carton from the hopper.

I will now describe the means by which the arms 129 and 130 are moved into the position shown in Fig. 7 when an article is missing from a pocket in the conveyor. Reference will be had particularly to Figs. 3, 4, 5, and 7 which most clearly show the means which I am about to describe.

To one of the guide members 33 are secured a plurality of bearing blocks 139 which rotatably support the shaft 140. To the right hand end of the shaft 140 is secured an arm 141, which projects substantially horizontally away from the shaft 140 towards the conveyor. An arm 142 pivoted at 143 to the bracket 78 has a downwardly extending projection 143', adapted to rest on the arm 141 whenever the arm 142 is not otherwise supported. The free end of the arm 142 rests on the horizontally extending member 105 which is carried by the link 101 so that the arm 142 moves upwardly whenever the link 101 moves upwardly and moves downwardly under its own weight when the link 101 moves downwardly. The arm 142 is provided with a feeler 144 having a horizontally extending portion 145 arranged above the pocket which is at the position F.

Whenever there is an article in a pocket at the position F, the horizontally extending portion 145 of the feeler will engage that article and limit the downward movement of the arm 142 at such a position that the lower end of the downwardly extending projection 143' will not engage the arm 141. However, when a pocket at the position F does not have an article therein, the horizontally extending portion 145 will move downwardly in excess of the permitted movement when an article is in the pocket at this position. Consequently, more of a downward movement will be permitted for the projection 143' on the arm 142 and the end thereof will engage the arm 141 and rotate the same together with the shaft 140. It will be understood, of course, that the horizontally extending portion 105 carried by the link 101 will move downwardly a sufficient distance to permit the necessary downward movement of the arm 142 and projection 143'.

To the left hand end of the shaft 140, I secure an upwardly extending hook or operating member 146, and this hook lies between a projection 147 on the arm 129 and the adjacent guide member 33. Ordinarily when the shaft 140 is not rotated, the hook 146 is not rotated, and therefore does not disturb the position of the arm 129 shown in Figs. 4 or 5 but whenever the shaft 140 is rocked, due to the rotation of the arm 141, the hook 146 moves against the projection 147 thereby rotating the arm 129 in Fig. 4 in a clockwise direction into the position shown in Fig. 7. In this latter position, as previously explained, the arms 129 and 130 are positioned so as to intercept the movements of the pins 126 thereby preventing the stripping of a carton from the hopper on the next movement of the transport to the right.

In Fig. 4, it will be noted that the carton at the position M is the carton which is in a position to be next fed from the hopper, and that the article 20 in the pocket F is the article which is

to be fed into the carton which now rests at the bottom of the stack of cartons in the hopper at the position M. Therefore, it is necessary that this carton be fed from the hopper, and consequently no rocking movement must be imparted to the shaft 140. That this will result is very evident from the description which has just been given for the feeler 144 will not move downwardly a sufficient distance to cause the downwardly extending projection 143' to engage the arm 141 due to the engagement of the horizontal portion 145 with the articles 30 in the pocket at the position F.

It will be noted that there is no article in the pocket G and this accounts for the fact that there is no carton shown at the position where the blade 62 is positioned in Fig. 4 or in Fig. 1. There is also an empty pocket at the position B, and consequently when the pocket at the position B arrives at the position F, the feeler 144 will move downwardly into the pocket sufficiently to cause the projection 143' to operate the arm 141, and thereby throw the arms 129 and 130 into the positions shown at Fig. 7, thereby preventing the feeding of the carton which would normally receive the article in the pocket at B if and when an article is in that pocket. I believe that it is unnecessary to explain the operation of this device except very briefly, as the details of the operation have been clearly set forth in the preceding description of my invention.

The articles are placed in the pockets 5' and are carried past the feeler 144 to the loading position H. Cartons are supported within the hopper 31 and stripped from the bottom of the stack in the hopper by means of the stripping member 117, the transport causing the successive movements of the cartons from the position M to the positions N and O, the latter being the position at which the article is received from the pocket H. The article is moved into the pocket H by means of the ejector 79, and after the article is in the carton, the cartons are conveyed along the guide members 33 by means of the transport members to positions at which the ends thereof may be closed or sealed as in my co-pending application No. 356,933.

Normally when the pockets are filled and the machine is in operation, the arms 129 and 130 are in the position shown in Fig. 4, but when an article is missing from a pocket at the position F, the feeler 144 moves downwardly an excessive amount and thereby rocks the arm 129, and consequently the arm 130 into the positions shown therefor in Fig. 7. In these positions of the arms 129 and 130, the arms 116 are not permitted to have their full upward movement when the transport moves upwardly to its highest position because of the engagement of the pins 126 with the underside of the arms 129 and 130 thereby preventing the feeding of a carton from the bottom of a stack in the hopper.

As the pins 126 move under the cam member 123, the cam surfaces 137 and 138 on the members 134 and 136 respectively, come into engagement with each other, and reestablish the positions for the arms 129 and 130 shown in Fig. 4 so that on the next movement of the transport, the stripping members 117 may be in the proper position to strip the carton from the stack within the hopper providing, of course, that the next corresponding pocket has an article therein to be received by that carton. If the next pocket is empty however, the feeler will again cause the arms 129 and 130 to move to the position shown

in Fig. 7 in time to prevent the stripping members 117 from moving the next carton out of the hopper.

Various modifications of my invention may be made without departing from the spirit of my invention, and therefore I do not wish to be limited except as set forth in the appended claims.

Having thus fully described an embodiment of my invention, what I desire to secure by Letters Patent of the United States is:

1. In a cartoning machine, the combination with a conveyor having a plurality of article receiving pockets, a hopper for receiving a plurality of cartons, a transport member having a stripping member carried thereby and movable relatively thereto, means for moving said stripping member in timed relation to the movements of said conveyor, means for normally holding said stripping member in operative position to remove a carton from said hopper as said transport moves along its path of movement, a detecting member arranged at a predetermined position to detect when an article is missing from a pocket presented at said last mentioned position, and means operated by said detecting mechanism for moving said stripping member out of its normal path of movement if and when an empty pocket is found to be empty by said detector a sufficient amount to prevent said stripper from stripping a carton from said stack, said detector operating in such a manner as to render said stripping member inoperative to feed that carton out of said hopper which would normally receive an article from said pocket.

2. In an article packaging machine, a carton source of supply, a reciprocable transport member for feeding a plurality of cartons, one by one, from said source of supply along a predetermined path to an article loading position, feeding means reciprocable with said transport member for feeding cartons, one by one, thereto from said source of supply, and means for adjusting the position of said feeding means relative to the transport member and the source of supply whereby to render the feeding means temporarily inoperative while said transport member remains operative.

3. In an article packaging machine, the combination with a movable transport member, of means on said transport member for feeding cartons from a plurality of cartons one by one along a predetermined path to a loading position, and means for rendering said feeding means temporarily inoperative without stopping said transport member comprising a cam member adapted to be interposed in the path of movement of said feeding means for moving said feeding means out of its normal path of movement.

4. A cartoning machine comprising a transport member having means thereon for moving cartons along a predetermined path after the same have been stripped from a stack of cartons, means for moving said transport, a stripping member for stripping cartons from a stack of cartons, said stripping member being movable relatively to and supported by said transport, a projection on said stripping member, and a cam movable into and out of the normal path of movement of said projection, said cam rendering said stripping member inoperative when said cam is moved into the path of movement of said projection without disturbing the operation of said first means on said transport.

5. In a carton feeding mechanism, the combination with a hopper for receiving a plurality of cartons, a stripping member movable to strip

cartons from said plurality of cartons in said hopper, a projection on said stripping member, a stationary plate positioned so that when said projection engages one side of said plate said stripping member is rendered inoperative, but when said projection is arranged on the other side of said plate said stripping member is operative, and means for selectively positioning said projection on opposite sides of said plate.

6. In a carton feeding mechanism, the combination with a hopper for receiving a plurality of cartons, a stripping member movable to strip cartons from said plurality of cartons in said hopper, a projection on said stripping member, a stationary plate positioned so that when said projection engages one side of said plate said stripping member is rendered inoperative, but when said projection is arranged on the other side of said plate said stripping member is operative, and means for selectively positioning said projection on opposite sides of said plate comprising a cam member movable into the path of movement of said projection for preventing movement of said projection to the side of said plate which would render the stripping member operative.

7. In a packaging machine, the combination with a conveyor having a plurality of article receiving positions thereon, means for supporting a plurality of cartons, means for stripping cartons one by one from said plurality of cartons, means for moving said cartons to a loading position after they have been stripped from said plurality of cartons, a detector for detecting when an article is missing from one of said article receiving positions, an abutment on said stripping member, a cam mechanism movable into the path of movement of said abutment to prevent operation of said stripping means and operative connections between said cam mechanism and said detecting member so that when said detector detects that an article is missing from one of said article receiving positions said cam mechanism will be operated to prevent the operation of said stripping means.

8. In a packaging machine, the combination with an endless conveyor having a plurality of pockets therein, means for driving said conveyor to present said pockets successively at a predetermined loading position, means for carrying a plurality of cartons, a transport member movable to position cartons at successive positions, one of which is said loading position, a stripping member for stripping cartons from said plurality of cartons, a member movably mounted adjacent said conveyor and adapted to contact with articles in said pockets if and when articles are in said pockets and to move into a position within said pockets when articles are missing from said pockets, a cam mechanism operated by the movement of said movable member when an article is missing from a pocket, and operative connections between said cam mechanism and said stripping member for rendering said stripping member inoperative at times when an article is missing from a pocket, said operative connections between said cam mechanism and said stripping member comprising a projection on said stripping member adapted to engage said cam mechanism for preventing the movement of said stripping member into its normal operative position.

9. In a carton feeding device for feeding cartons from a plurality of cartons arranged in a stack comprising a carrier movable in a defined path, a stripping member movably mounted on said carrier and having an abutment adapted

to engage one edge of a carton to be removed from said stack, means for normally maintaining said stripping member in a position to engage the edge of a carton at a predetermined position during the cycle of movement of said carrier so that cartons are stripped periodically from said stack, and means for preventing said stripping member from occupying its normal position for stripping a carton from said stack without changing the cycle of movement of said carrier.

10 10. In a carton feeding device for feeding cartons from a plurality of cartons arranged in a stack comprising a carrier movable in a defined path, a stripping member movably mounted on said carrier and having an abutment adapted to engage one edge of a carton to be removed from said stack, means for normally maintaining said stripping member in a position to engage the edge of a carton at a predetermined position during the cycle of movement of said carrier so that cartons are stripped periodically from said stack, and means for preventing said stripping member from occupying its normal position for stripping a carton from said stack without changing the cycle of movement of said carrier, comprising a member normally lying entirely out of the path of movement of said stripping member but adapted to engage a portion of said stripping member when moved to an abnormal position so as to prevent the normal movement of said stripping member for the purposes specified.

11. In a carton feeding device, the combination with a stationary hopper for receiving cartons which are to be filled, a stripping member, means for moving said stripping member periodically through a normal path of movement past the under side of said hopper, means for supporting the cartons in said hopper in a position such that the lower-most carton is in a position to be engaged by said stripping member as it moves along its normal path of movement, whereby a carton is normally stripped from the stack of cartons in said hopper, and a member engageable with the stripping member for deviating said stripping member out of its normal path of movement as it is moved past the under side of said hopper and into a position such that it will not engage the lower-most carton, whereby the same will not strip the carton from the stack.

12. In a carton feeding device, the combination with a hopper for receiving cartons which are to be filled, a stripping member movable periodically past the under side of said hopper, means for supporting the cartons in said hopper in a position such that the lower-most carton is in a position to be engaged by said stripping member as it moves along its normal path of movement, whereby a carton is stripped from the stack of cartons in said hopper, and means for moving said stripping member out of its normal path of movement as it passes the under side of said hopper and into a position such that it will not engage the lower-most carton and thereby will not strip the same from the stack, said means comprising an abutment on said stripping member and a plate selectively movable into and out of a position to engage said abutment to prevent said stripping member from moving close enough to the lowermost carton to strip the same as the stripping member moves past the under side of said hopper.

13. A device as claimed in claim 12 in which means is provided for automatically moving said plate out of a position to engage said abutment after said stripping member has been prevented

from stripping a carton from the bottom of a stack in said hopper.

14. In a packaging machine, the combination with a hopper for cartons having a support for the stack of cartons adapted to be placed therein, a carrier movable transversely to the bottom of said hopper, a pair of arms movably mounted on said carrier and yieldingly urged in a direction toward the adjacent end of said hopper, abutment surfaces on said arms adapted to engage the edge of a carton as said carrier moves transversely to the under side of said hopper and strip said carton from the remaining cartons in said hopper, laterally extending pins on said arms, a pair of inter-connecting pivoted plates normally lying wholly without the path of movement of said pins, means for moving said carrier in a substantially orbital path in a plane substantially perpendicular to the lower-most carton in said hopper, operating means for moving said pivoted plates into the path of movement of said pins for arresting the movement of said pins, and moving said arms against said yielding means whereby said arms are held out of operative position and cannot strip a carton from the stack in said hopper on the movement of said carrier along its path, and means for automatically restoring said pivoted plates to an inoperative position after said plates have prevented one carton from being stripped from the stack within said hopper.

15. A device as claimed in claim 14 in which means is provided for feeding said cartons after they are stripped to a loading position where they are to receive articles and in which means is provided for feeding articles to a position adjacent said loading position in timed relation to the feeding of said cartons to that position, and in which there is also means which becomes operable to actuate said operating means for said plates to move them into the path of movement of said pins whenever an article is missing from the line of articles being fed to a position adjacent said loading position and at a time during the feeding of the articles such that a carton will not be fed to said loading position except when an article is also fed to that position to be moved into said carton at said loading position.

16. A device of the class described comprising a hopper for receiving the cartons and the like which are to be stripped therefrom, a support at the bottom of the hopper upon which portions of the lowermost carton rest, a member movable along a fixed path to and past the bottom of said hopper, a stripper carried by said member having a projection thereon adapted to contact with the lowermost carton in the hopper as the stripper moves along its normal path of movement to remove said carton from said hopper, said stripper being yieldingly pressed in a direction toward the stack of cartons in the hopper, a plate adjacent the path of movement of said stripper, a second projection on said stripper adapted to pass said plate on one side thereof as the stripper moves past said cartons during its normal movement along its path, said plate engaging said projection to prevent movement of said stripper away from the stack of cartons in said hopper, means for returning said stripper to its original position after a carton is stripped from said stack with the said second projection passing beneath said plate, and cam means normally inoperative adapted to move into a position above said second projection to prevent said second projection from moving into a position above said plate as the stripper is moved on its next move-

ment toward the stack of cartons, and instead guide said second projection to a position beneath said plate, whereby said plate prevents contact of said stripper with said cartons during the movement of the stripper past said hopper.

17. A device as set forth in claim 16 which includes in addition conveying means for feeding articles and said cartons to a loading position where the articles are inserted within said cartons and in which there is a means for detecting when an article is missing from an article receiving position on said conveying means and in which said detecting means is operatively connected to said cam means and actuates said cam means to move the same into operative position for preventing movement of said stripping member into operative position on a predetermined movement of said stripping member past the stack of cartons in said hopper and when an article receiving position is vacant, whereby said stripper will not feed a carton to the loading position, the carton which is not fed to said loading position being the one which normally would have been stripped from said stack and fed to said loading position to receive an article from the article receiving position which is vacant.

18. In a device of the class described, the combination with means for supporting a stack of cartons, a carton advancing member having a recurring cycle of movement along a given path, projections thereon adapted to advance a series of cartons through successive positions, one of said projections being a stripping projection for stripping a carton from said stack on each recurring movement of said advancing member, another of said projections being an advancing projection for advancing the carton after it is stripped by said stripping projection, and means for rendering said stripping projection inoperative to strip a carton from said stack without destroying the operativeness of said other projection to advance cartons which are in a position to be advanced thereby.

19. In a device of the class described, the combination with means for supporting a stack of cartons, a carton advancing member having a recurring cycle of movement along a given path, projections thereon adapted to advance a series of cartons through successive positions, one of said projections being a stripping projection for stripping a carton from said stack on each recurring movement of said advancing member, said projection being mounted for movement relative to said advancing member, means for moving said projection relative to said advancing member to render said stripping projection inoperative to strip a carton from said stack as it normally would during its cycle of movement, and without destroying the operativeness of another projection, which latter projection is adapted to advance the carton after being stripped from said stack by said stripping projection.

20. In a device of the class described, the combination with means for supporting a stack of cartons, a carton advancing member having a recurring cycle of movement along a given path, projections thereon adapted to advance a series of cartons through successive positions, one of said projections being a stripping projection for stripping a carton from said stack on each recurring movement of said advancing member, said projection being mounted for movement relative to said advancing member, means for moving said projection relative to said advancing

member to render said stripping projection inoperative to strip a carton from said stack as it normally would during its cycle of movement, and without destroying the operativeness of another projection, which latter projection is adapted to advance the carton after being stripped from said stack by said stripping projection, said means for rendering said stripping projection inoperative comprising an abutment on said stripping projection, and means for engaging said abutment to move the same out of its normal path of movement, and thus move the stripping projection relative to said advancing member out of operative position.

21. In a device of the class described, the combination with means for supporting a stack of cartons, a carton advancing member having a recurring cycle of movement along a given path, projections thereon adapted to advance a series of cartons through successive positions, one of said projections being a stripping projection for stripping a carton from said stack on each recurring movement of said advancing member, said projection being mounted for movement relative to said advancing member, means for moving said projection relative to said advancing member to render said stripping projection inoperative to strip a carton from said stack as it normally would during its cycle of movement, and without destroying the operativeness of another projection, which latter projection is adapted to advance the carton after being stripped from said stack by said stripping projection, said means for rendering said stripping member inoperative comprising a stationary plate, an abutment member on said stripping projection normally passing on a given side of said plate during normal stripping operation of the same, means for directing said abutment member into a position on the other side of said plate as said advancing member moves along its path, whereby to hold said stripping member out of its normal path of movement a sufficient amount to prevent the same from engaging and stripping a carton from said stack.

22. A device as set forth in claim 21, in which said abutment member normally travels along a closed path circumscribed about said plate, and in which deflecting means are provided for engaging said abutment member, and for deflecting it out of its normal path to cause the same to move along the side of said plate other than said given side during the time the same would normally move along said given side, said plate thereafter holding said member out of its normal path of movement a sufficient amount, as said carrier advances, to prevent said stripping projection from stripping a carton from said stack.

23. An article packaging machine comprising a stationary reservoir for wrappers, a stripper, means for moving said stripper through a normal path of travel past said reservoir, the wrappers being so held in said reservoir that a wrapper is engaged and removed from the reservoir by the stripper in its normal movement, and a member engageable with the stripper for deviating said stripper from its normal path of travel as it is moved past the reservoir so that a wrapper is not engaged.

24. An article packaging machine comprising a stationary reservoir for wrappers, a stripper, means for moving said stripper through a normal path of travel past said reservoir, the wrappers being so held in said reservoir that a wrap-

per is engaged and removed from the reservoir by the stripper in its normal movement, and means including a cam member engageable with the stripper during movement thereof for deviating said stripper from its normal path of travel as it is moved past the reservoir so that a wrapper is not engaged.

25. An article packaging machine comprising a stationary reservoir for wrappers, stripping means movable through a normal path of travel past said reservoir for moving wrappers from the reservoir to an article wrapping position, the wrappers being so held in said reservoir that a wrapper is engaged and removed from the reservoir by the stripping means in its normal movement, a conveyor for conveying the articles to be wrapped to said wrapping position, a detector for detecting the presence or absence of an article on said conveyor, and a member controlled by said detector for engaging and deviating said stripping means from its normal path of travel as it is moved past the reservoir, so that a wrapper is not engaged when no article corre-

sponding to such wrapper to be wrapped thereby is present on said conveyor.

26. An article packaging machine comprising a stationary reservoir for wrappers, stripping means movable through a normal path of travel past said reservoir for moving wrappers from the reservoir to an article wrapping position, the wrappers being so held in said reservoir that a wrapper is engaged and removed from the reservoir by the stripping means in its normal movement, a conveyor for conveying the articles to be wrapped to said wrapping position, a detector for detecting the presence or absence of an article on said conveyor, means rendered operative by said detector for deviating said stripping means from its normal path of travel as it is moved past the reservoir, so that a wrapper is not engaged when no article corresponding to such wrapper to be wrapped thereby is present on said conveyor, and means controlled by the movement of said stripping means for restoring said deviating means to inoperative condition.

MICHAEL J. MILMOE.