

[72] Inventor **Wickliffe Jones**  
**Cincinnati, Ohio**  
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 [73] Assignee **R. A. Jones and Company, Inc.**  
**Covington, Ky.**

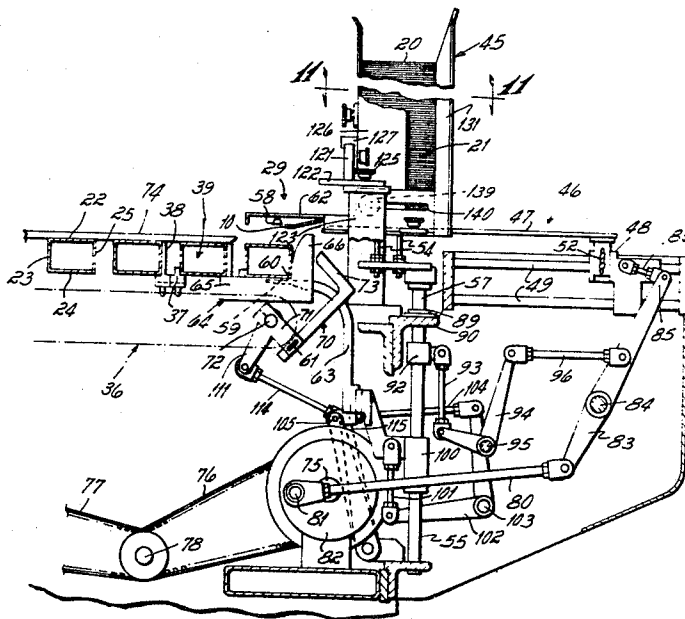
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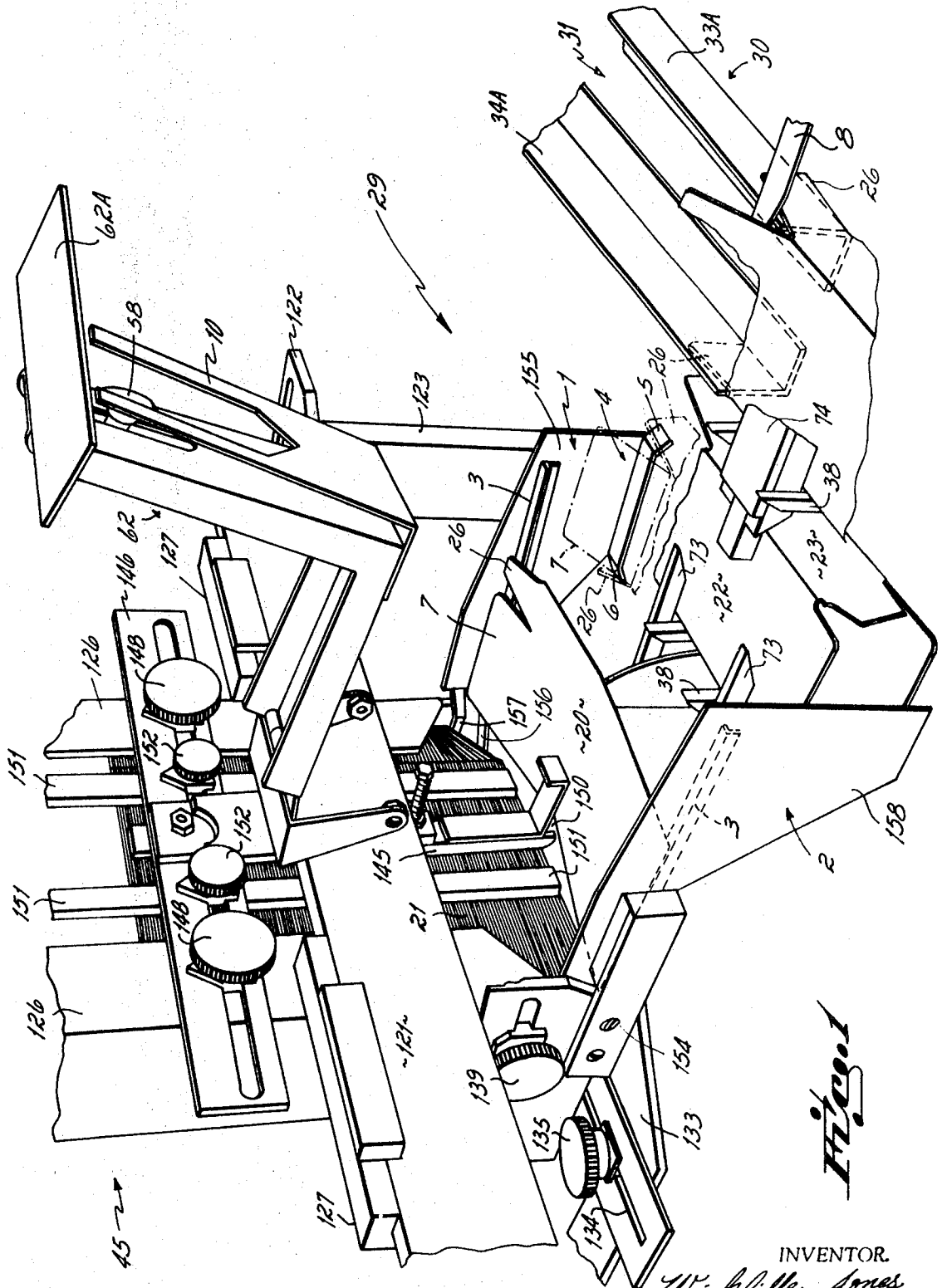
*Primary Examiner—Bernard Stickney*  
*Attorney—Wood, Herron & Evans*

[54] **CARTON FEEDING AND ERECTING APPARATUS**  
**9 Claims, 13 Drawing Figs.**

[52] U.S. Cl..... **93/53 R,**  
**53/186**  
 [51] Int. Cl..... **B31b 1/76**  
 [50] Field of Search..... **93/53 SD,**  
**53, 37 R; 53/186**

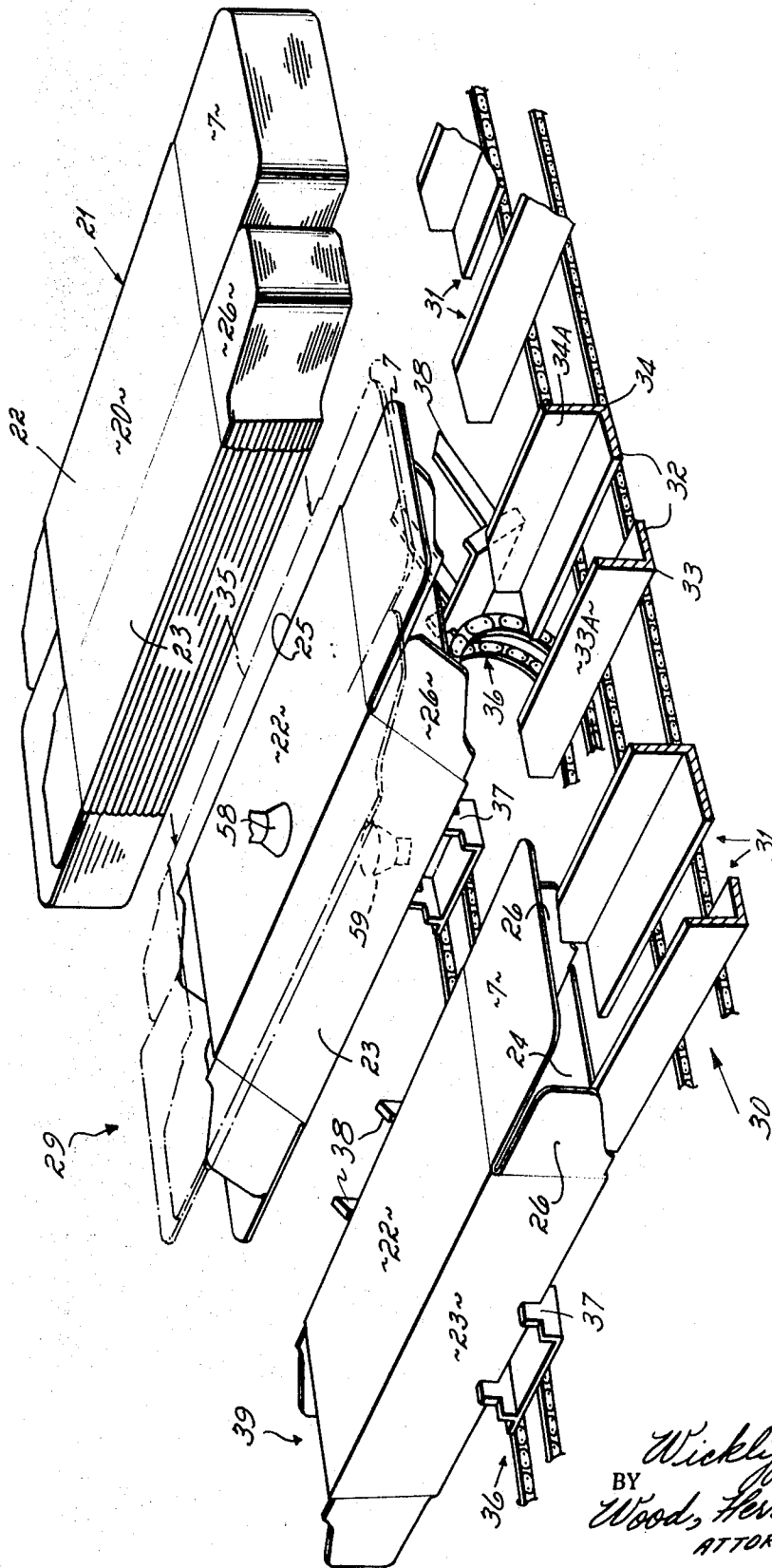
**ABSTRACT:** Apparatus whereby flat folded carton blanks are fed one at a time from a stack contained within a magazine, each blank being gripped between opposed suction cups, the lower suction cup pulling the carton downwardly against a guide to open or erect it, the erected carton then being carried away between forward and rearward lugs of a transport conveyor.





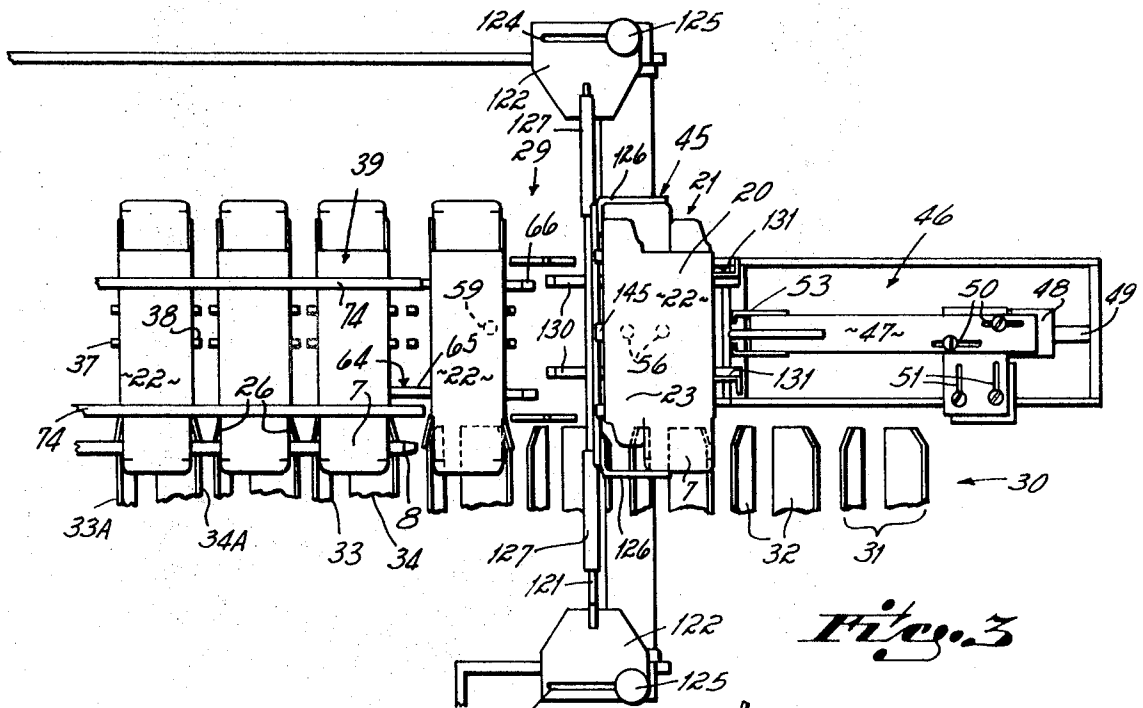
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INVENTOR.  
*Wickliffe Jones*  
BY  
*Wood, Heron & Evans*  
ATTORNEYS

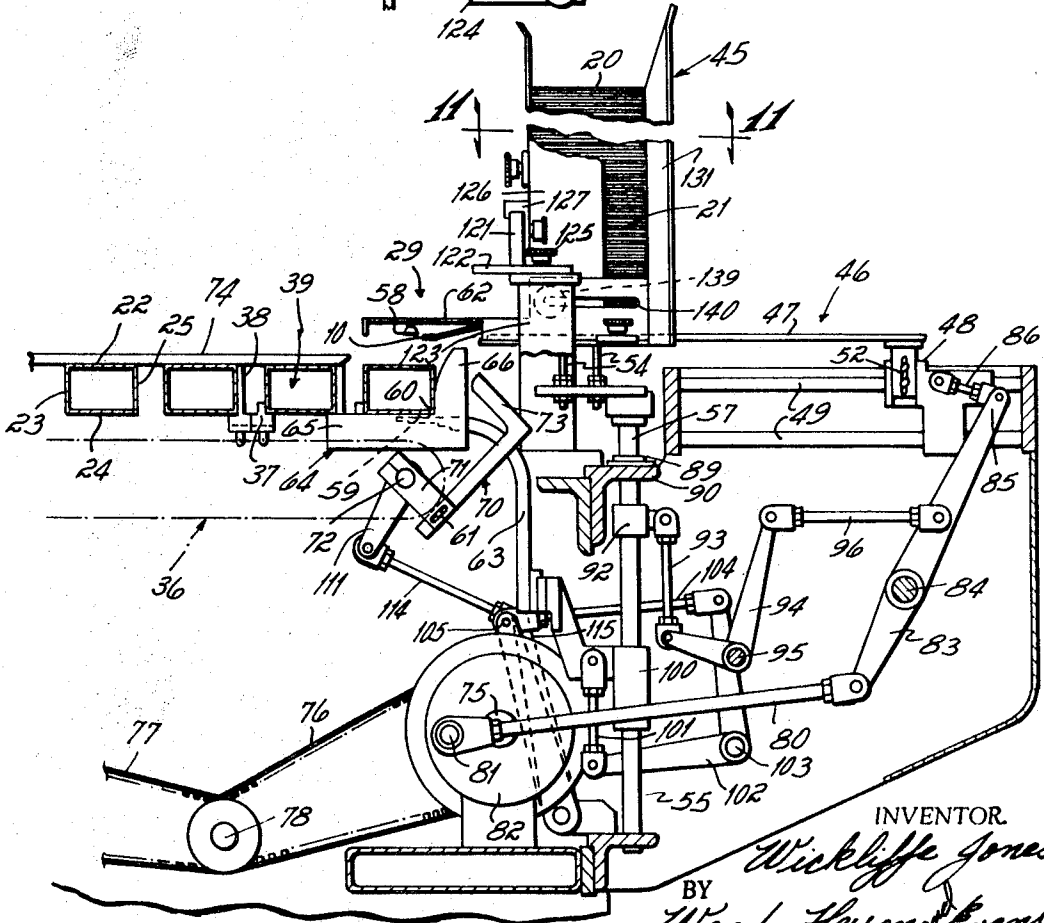


*Fig. 2*

INVENTOR  
*Wickliffe Jones*  
BY  
*Wood, Heron & Evans*  
ATTORNEYS

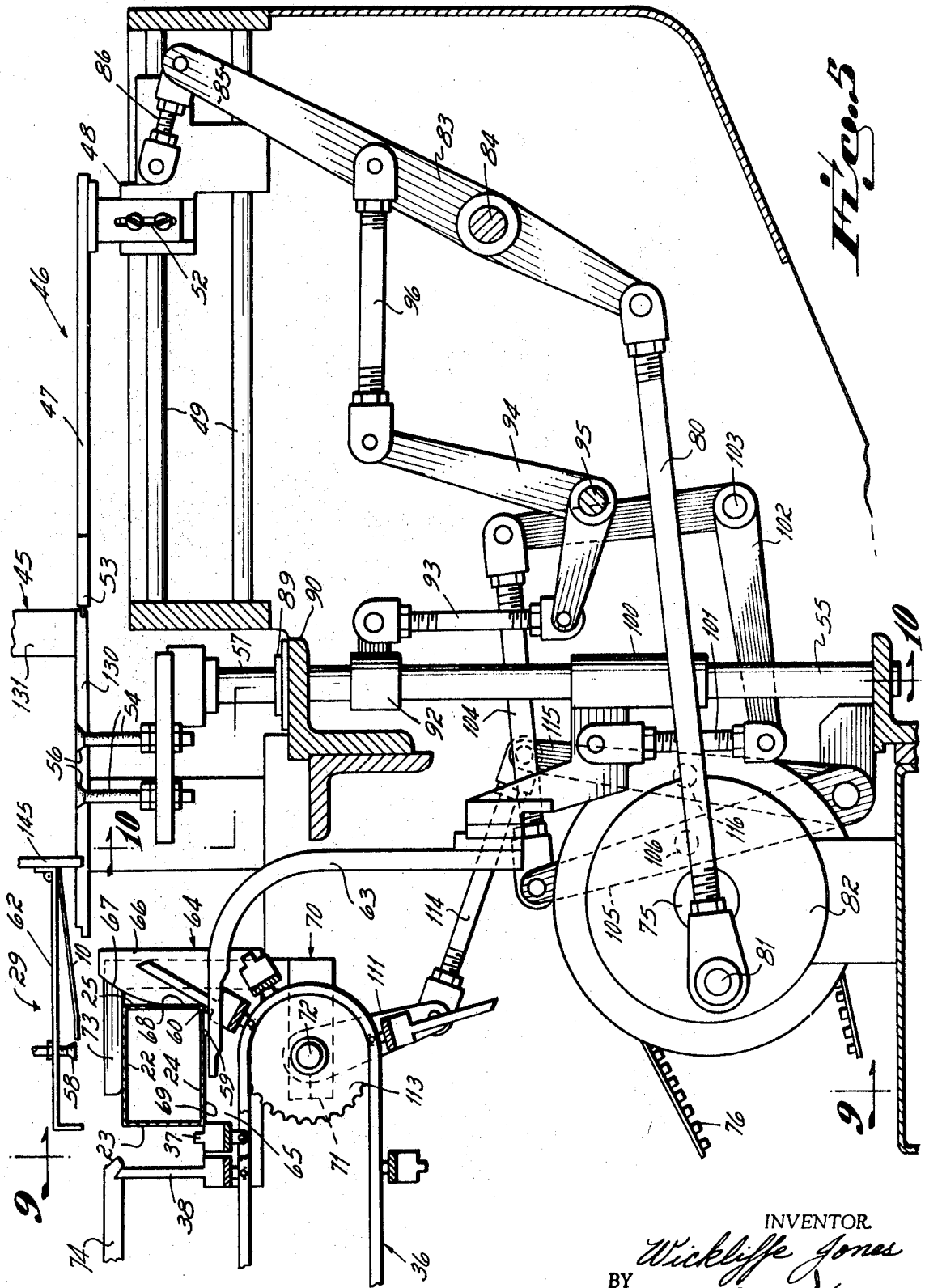


*Fig. 3*

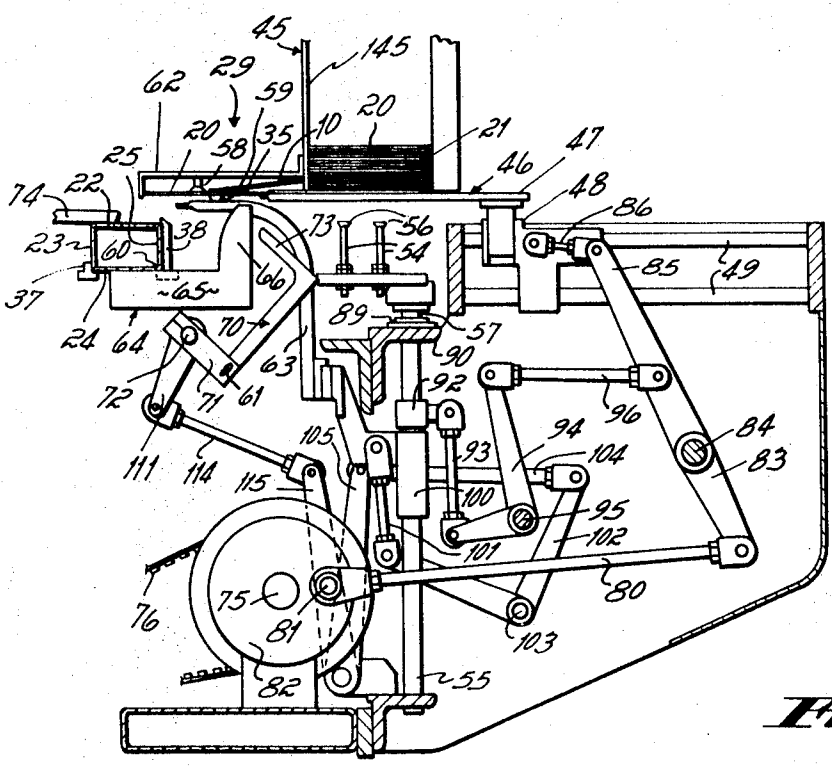
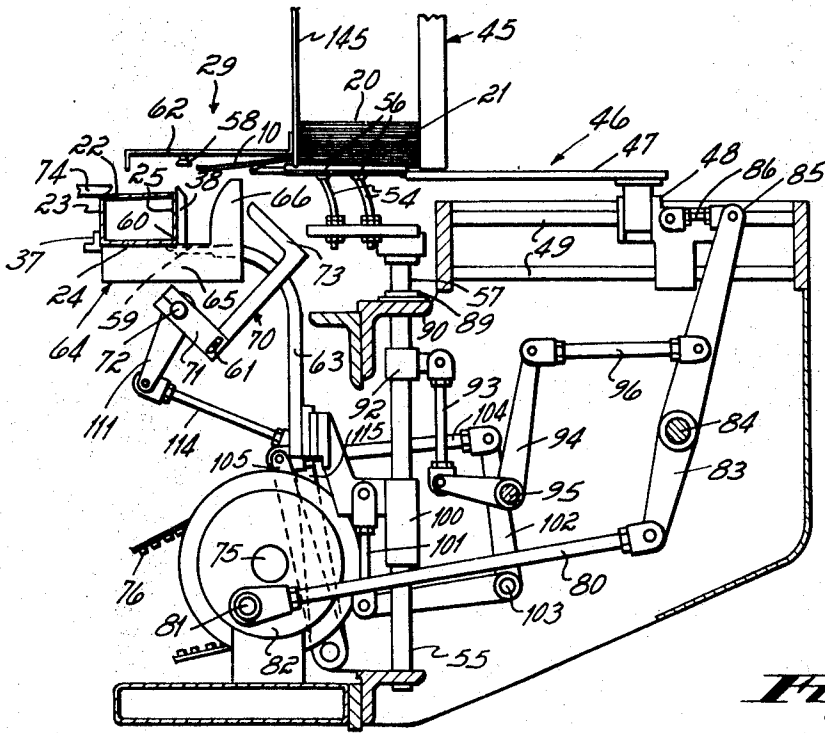


*Fig. 4*

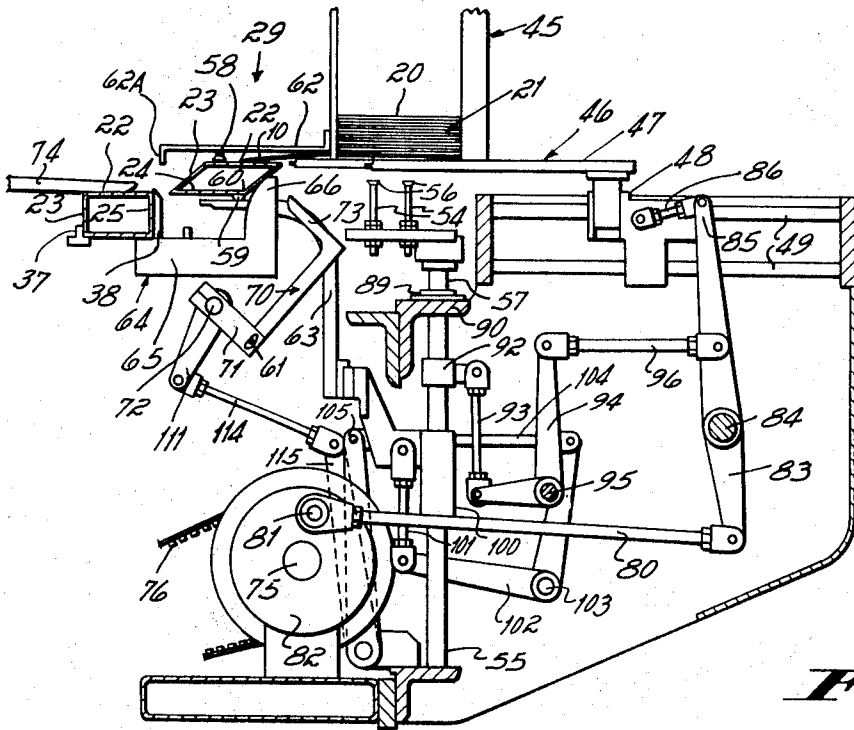
INVENTOR.  
*Wickliffe Jones*  
BY *Wood, Heron & Evans*  
ATTORNEYS



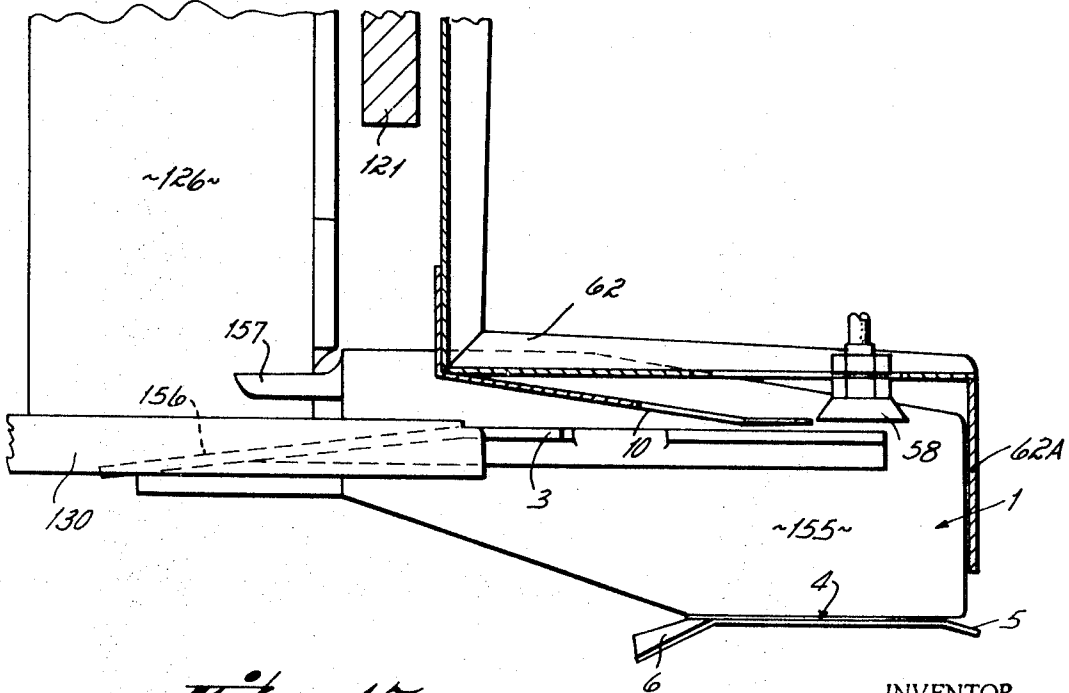
INVENTOR  
*Wickliffe Jones*  
BY  
*Wood, Herron & Evans*  
ATTORNEYS



*Wickliffe Jones*  
INVENTOR.  
*Wickliffe Jones*  
BY *Wood, Heron & Evans*  
ATTORNEYS



*Fig. 8*



*Fig. 13*

INVENTOR  
*Wickliffe Jones*  
BY  
*Wood, Heron & Evans*  
ATTORNEYS

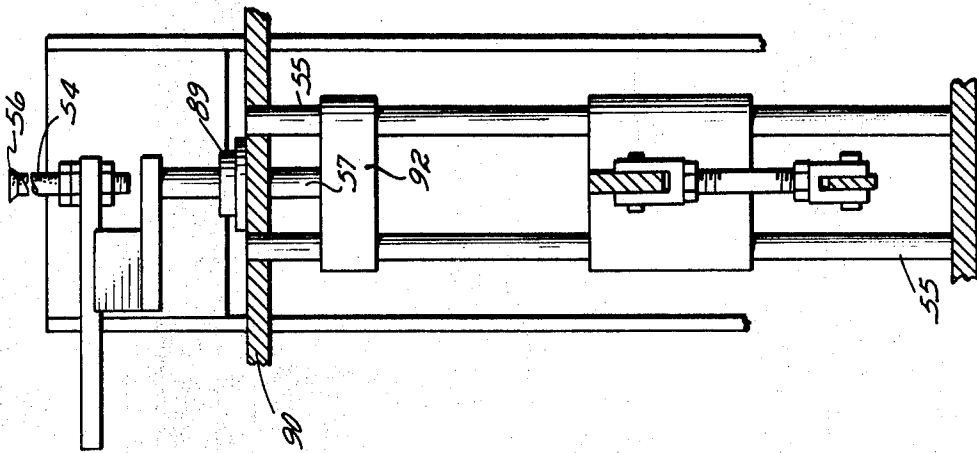


Fig. 10

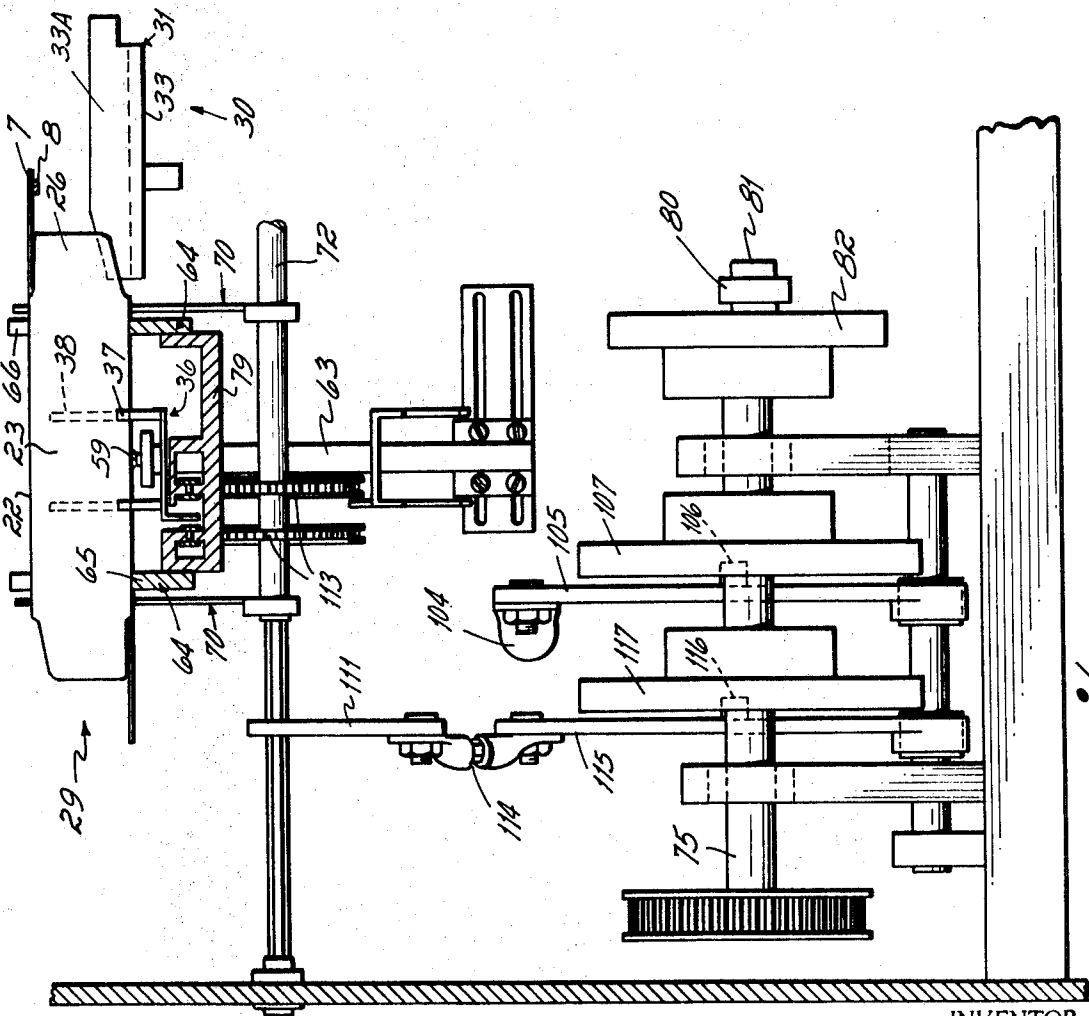
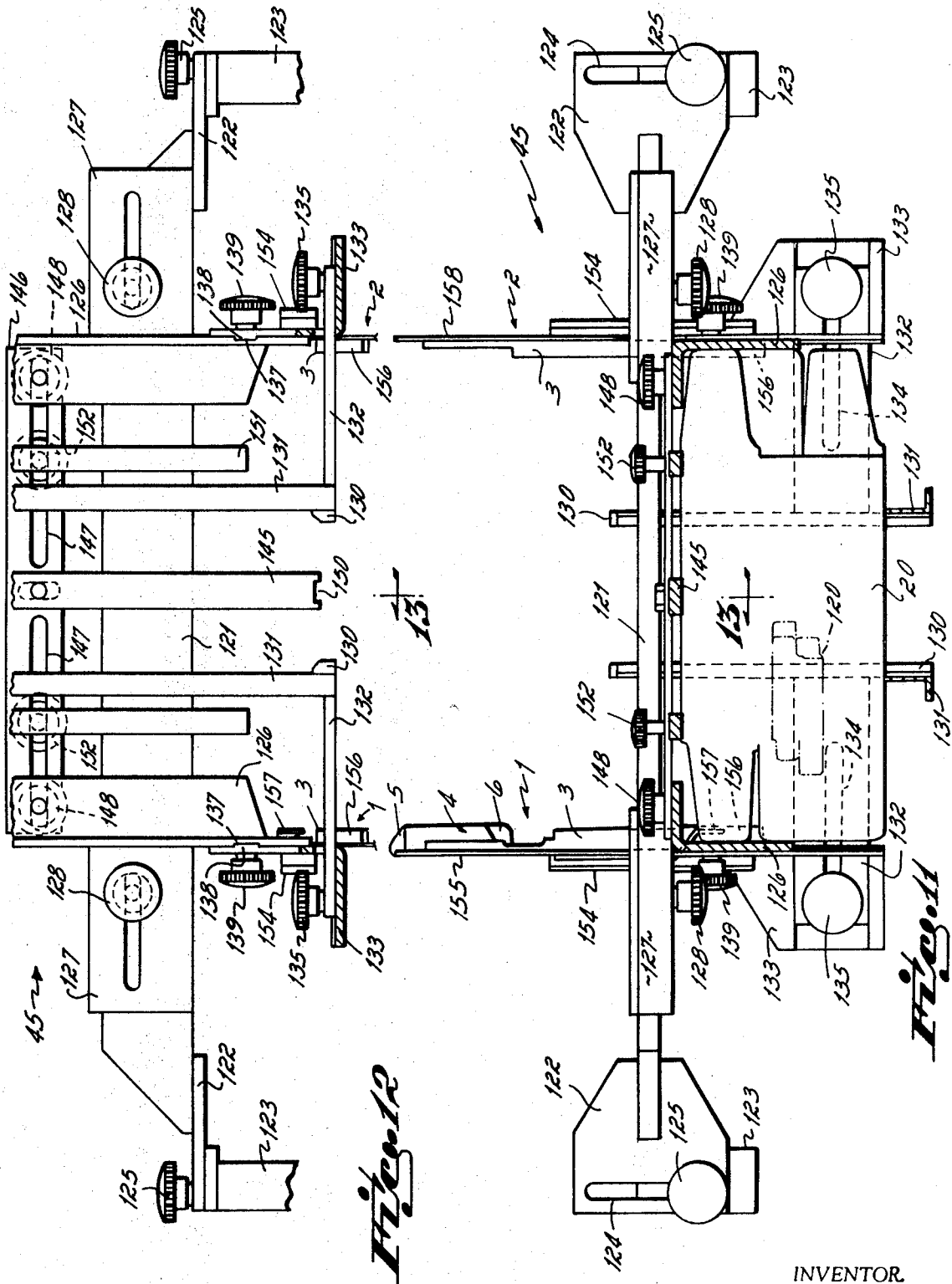


Fig. 9

INVENTOR  
*Wickliff Jones*  
 BY  
*Wood, Heron, Evans*  
 ATTORNEYS





INVENTOR  
*Wickliffe Jones*  
BY  
*Wood, Heron & Evans*  
ATTORNEYS

## CARTON FEEDING AND ERECTING APPARATUS

This invention relates to a cartoning machine and more particularly to apparatus for feeding carton blanks from a magazine and erecting them preparatory to filling them with a product.

In cartoning machines in use today, flat folded carton blanks are stacked in a magazine and fed out of the magazine one at a time from the bottom of the stack. Varying types of mechanisms have been provided for opening the carton blanks as they are fed from the stack in such a manner that the open cartons can be captured between the forward and rearward transport lugs of an endless conveyor. In thus opened condition, the cartons are conveyed adjacent a bucket conveyor having a product bucket moving alongside each carton. Means are provided to thrust the product from the bucket into the adjacent carton.

The product buckets normally have leading and trailing vertical walls or flanges which are engaged by the carton side flaps to hold the flaps open so that the product can be thrust unimpeded into the carton. In one form of a cartoning machine, the engagement of the carton flaps with the bucket vertical walls is effected by causing the bucket conveyor to move gradually upwardly to a position of alignment with the transport conveyor whereby, during the upward movement of the bucket conveyor, the vertical walls of the respective buckets gradually move into engagement with the carton side flaps.

An objective of the present invention has been to provide an improved carton opening or erecting mechanism, and more particularly this objective of the invention includes the provision of a stationary upper suction cup which is engageable with the upper portion of the carton blank, a movable opposed lower cup which is engageable with the lower surface of the carton, a stationary erecting guide adjacent the lower suction cup and a pivotable stabilizer engageable with the carton to hold it erected. The downward movement of the lower suction cup pulls the carton blank against the stationary guide, the engagement of the carton with the stationary guide causing the carton to become fully erected.

The stabilizer is adapted to be moved into position over an erected carton to hold it in erected condition while it is in the process of being captured between the transport lugs and conveyed under an overlying rail. This structure prevents the carton, due to its resilience, from popping out of its proper position between the transport lugs.

Another objective of the present invention has been to provide structure for pulling each carton blank downwardly in relation to the vertical walls of its respective product bucket so that as the carton is moved downwardly, its side flaps engage the outside surfaces of the bucket walls, thereby holding the flaps open so that the carton is in condition to receive a product from the bucket. This feature of the invention permits the elimination of the several feet of upward movement of the bucket conveyor which had heretofore been required to effect the engagement of the carton flaps with the bucket walls.

Another objective of the invention has been to provide a cartoner which is adapted to accept a wide range of carton sizes with a minimum number of adjustments required to shift the cartoner from one size of carton to another. To this end, the invention provides a magazine having simplified adjustment features to enable it to accommodate cartons of varying sizes, and a single-blade carton ejector whose adjustments are simplified because of the single blade, the magazine and carton ejector all being adapted to cooperate with the carton-erecting mechanism.

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

FIG. 1 is a fragmentary perspective view of the invention illustrating the erecting station;

FIG. 2 is a diagrammatic perspective view illustrating the carton-opening operation;

FIG. 3 is a fragmentary top plan view of the cartoner illustrating the opening mechanism;

FIG. 4 is a longitudinal cross-sectional view taken through the cartoner illustrating the mechanism of FIG. 3 in side elevation;

FIG. 5 is an enlarged view similar to FIG. 4 further illustrating the linkage system by which the several operations of the erecting mechanism are effected;

FIGS. 6, 7 and 8 are views similar to FIGS. 4 and 5 illustrating the various stages of operation;

FIG. 9 is a cross-sectional view, partly in elevation, taken along lines 9—9 of FIG. 5;

FIG. 10 is a cross-sectional view, partly in elevation, taken along lines 10—10 of FIG. 5;

FIG. 11 is a top plan view, partly in section, of the carton-containing magazine taken along lines 11—11 of FIG. 4;

FIG. 12 is a rear elevational view thereof; and

FIG. 13 is a cross-sectional view taken along lines 13—13 of FIG. 11.

As shown in FIGS. 1 and 2, the erecting mechanism receives cartons 20 which are flat folded and stacked as indicated at 21. Each carton has an upper major wall 22, an upwardly facing leading sidewall 23, a lower major wall 24, and a downwardly facing trailing sidewall 25. Side flaps 26 are hinged to the sidewalls 23 and 25.

Adjacent the stack of cartons 21 is an erecting station 29 which includes mechanism, to be described below, for opening the cartons. Running alongside the erecting station 29 is a bucket conveyor 30 which conveys individual buckets 31 as they carry products to be inserted into the cartons. Each bucket has a leading element 33 carried by a first conveyor chain and a trailing element 34 carried by a second conveyor chain. The chains are relatively adjustable to vary the spacing between the elements. Each bucket element has a bottom wall 32, a leading vertical wall 33A and a trailing vertical wall 34A. A transport conveyor 36 which receives the carton runs generally parallel to the bucket conveyor 30. The transport conveyor has a first chain which carries short forward lugs 37 and a second chain which carries taller rearward lugs 38 between which the cartons are captured.

The objective of the mechanism at the erecting station 29 is to receive a carton from the bottom of the stack 21 and open it by drawing the lower walls 24 and 25 downwardly as shown at 35 into a position in which the carton will be captured between the forward and rearward transport lugs 37 and 38. Simultaneously with the opening of the carton, the end flaps are drawn down over the outside of the vertical walls 33A and 34A of the product buckets 31 and held in the position illustrated by the carton at 39 so that a product can be thrust unimpeded into the carton.

As shown in FIGS. 3 and 4, the carton stack 21 is contained in an adjustable magazine 45, which will be described in greater detail in connection with FIGS. 11 to 13. Rearwardly of the magazine is an ejector assembly 46 which includes a single ejector blade 47 mounted on a block 48 which is slidable on rods 49. Slots and setscrews 50 provide for longitudinal adjustment of the blade; slots and setscrews 51 provide for transverse adjustment of the blade; and slots and setscrews 52 provide for vertical adjustment of the blade. The blade has a forward end 53 which is configured to engage the edge of a carton when it is slightly separated from the stack and thrust it in a forward direction out of the stack and into the erecting mechanism.

A pair of suction cups 56 mounted on elongated flexible stems 54 are located below the magazine and are mounted on a vertical rod 57 which is reciprocally mounted on a pair of guide rods 55, as will be described below. The suction cups 56 are adapted to engage the undersurface of a carton at its center to bow the lowermost carton slightly downwardly away from the cartons remaining in the stack. Thus, through the action of the suction cups 56, the lowermost carton is separated from the cartons above it and drawn into a position where it is engageable by the forward end 53 of the ejector blade. During the initial ejecting movement of the carton, the suction cups 56 stay with the carton, with the stems 54 bending forwardly so as to hold the carton bowed slightly to permit it to pass

under a forward carton stop forming part of the magazine, as will be described below.

A right-hand carton guide 1 and a left-hand carton guide 2 are mounted on the sides of the magazine 45 and project forwardly from the magazine. Each guide has a vertical wall to which a horizontal rail 3 is mounted at approximately the level of the lowermost carton in the stack. Each carton, as it is ejected from the stack, rides upon the rails until it attains the full extent of its forward ejecting movement.

The right-hand guide 1 has a side flap spreader 4 projecting inwardly from its lower edge. The spreader 4 has a leading flange 5 and a trailing flange 6 which are engaged by the respective side flaps 26 to spread them apart as shown in FIGS. 1 and 2 so that as the carton is drawn downwardly, the side flaps straddle the vertical walls 33A and 34A of the product buckets. The spreader 4 also holds the tuck flap 7 in an upwardly angled position as shown in FIG. 1 until it is picked up by a rail 8, which holds it in an upwardly angled condition until the product has been thrust into the carton.

At the erecting station 29 a vertically fixed upper suction cup 58 and a lower movable suction cup 59 are mounted in front of the magazine and form a part of the erector mechanism. The position of the cups is such as to receive a flat carton blank between them when the ejector blade 47 has thrust the carton to its forwardmost position. More particularly, it is preferred that the lower suction cup be in such a position to engage the lower major wall 24 of the carton immediately adjacent the score line 60 between wall 24 and the trailing sidewall 25 of the carton.

It should be understood that where very large cartons are to be opened, more than one upper and lower suction cup may be used, and where plural suction cups are used, the rearward cup of the lower group should be engageable with the carton adjacent the carton score line 60.

The upper suction cup 58 is fixably mounted on a bracket 62 which projects forwardly of the magazine. In FIG. 1 the bracket is shown pivoted upwardly so as to expose the rest of the erecting mechanism for the purpose of illustration. The bracket also carries a forked flexible guide 10 which forces the center portion of the carton downwardly a distance just sufficient to clear the suction cup 58. The bracket also carries a stop 62A which is engaged by an ejected carton and which thereby determines the longitudinal extent of the ejecting movement of the carton.

The lower suction cup 59 is mounted on an L-shaped bracket 63 which is in turn slidable on the vertical rods 55. Both suction cups 58, 59 are connected to a vacuum source by flexible tubes, not shown. The vacuum source is programmed to apply a vacuum to the upper suction cup 58 only during a brief period as the lower cup 59 begins its descent as, for example, the first three-eighths inch of descent. The time is just sufficient to open the carton slightly, that is, to permit the lower cup to pull the downwardly facing walls away from the upwardly facing walls and thereby to prevent both upper and lower walls from bowing together into a vee. Vacuum remains applied on the lower suction cup until it is moved away by the transport lugs.

Two laterally spaced stationary guides 64 are mounted on a frame 79 (FIG. 9) which supports the upstream sprockets for the transport conveyor and are adjacent the lower suction cup 59. Each guide is L shaped, having a horizontal leg 65 and a vertical leg 66. The horizontal leg presents a straight upper surface 69 and is engageable by the lower major wall 24 of a carton. The forward surface of the vertical leg 66 has a curved upper portion 67 and a straight lower portion 68, forming a right angle with the straight upper surface 69 of the horizontal leg. The curved upper portion 67 is engageable by the trailing sidewall 25 during the beginning of its downward movement. The vertical surface 68, cooperating with the straight horizontal surface 69, completes the squaring-up of the carton when the score line 60 is drawn into the vertex of the right angle formed between the surfaces 68 and 69.

An L-shaped stabilizer 70 is adjustably fixed by a screw 61 to an arm 71 which is in turn fixed to a shaft 72. The stabilizer has a free end 73 adapted to overlie an erected carton to hold the carton in its erected condition until it is moved by the transport conveyor 36 to a position under a stationary rail 74. The shaft 72 is rotatable in timed relation to the movement of the lower suction cup, as will appear below.

The entire ejecting and erecting mechanism is driven from a common shaft 75 which is in turn driven by a cog belt 76 connected to the main drive for the cartoner through another cog belt 77 connected to a common shaft 78. Referring to FIGS. 5, 9 and 10, the carton ejector 46 and the suction cups 56 are both operated from a rod 80 which is eccentrically mounted at 81 on a plate 82 driven by the shaft 75. The rod is connected to a lever 83 pivoted on a shaft 84. The upper end 85 of the lever 83 is pivotally connected to a link 86 which is in turn pivoted to the slidable block 48. The vertical rod 57 which carries the suction cups 56 is slidable in a bushing 89 mounted on a frame member 90. A collar 92, slidably mounted on the guide rods 55, is fixed to the rod 57 and is connected by a link 93, bellcrank lever 94 mounted on a fixed stub shaft 95, and a link 96 to the lever 83 so that oscillation of the lever 83 causes a vertical reciprocatory motion of the vertical rod 57 and, hence, the suction cups 56 in timed relation to the ejector mechanism.

The bracket 63 which carries the lower suction cup 59 is mounted on a sleeve 100 which is slidable on the vertical guide rods 55. The sleeve 100 is connected by a link 101 and a bellcrank lever 102 mounted on a fixed stub shaft 103 and a link 104. The cam follower 105 has a bearing 106 which rides in a cam track (not shown) of a cam 107 (FIG. 9) which is rotated by the shaft 75. The L-shaped stabilizer 70 is mounted on the arm 71 which is fixed to the shaft 72 on which a sprocket 113 for the transport conveyor 36 is rotatably mounted. An arm 111 is fixed to the shaft 72 at one end and is connected at its other end by a link 114 to a cam follower 115. The cam follower 115 has a bearing 116 which rides in a cam track (not shown) of a cam 117 (FIG. 9) to effect the reciprocation of the arm and, hence, the stabilizer.

The sequence of operations can best be understood by reference to FIGS. 4 through 8. As shown in FIG. 5, the operation of erecting a carton has been completed, and the apparatus is in condition to eject a fresh blank to begin a sequence of operations. As can be seen from FIG. 5, the ejector blade 47 is withdrawn to a rearmost position and the suction cups 56 are in their uppermost position. As shown in FIG. 6, a slight rotation of the shaft 75 has caused the stabilizer 70 to swing out of the way of the ejector mechanism while the transport lugs have begun carrying the freshly erected carton downstream. The suction cups 56 have lowered slightly to bow the lowermost carton away from the next adjacent carton, and in this condition the ejector blade 47 has been thrust slightly forward to engage the carton to begin its ejection from the stack. During the initial thrust, the cups 56 flex forwardly, bending their stems 54 to hold the carton bowed downwardly until it clears the stop 145.

As shown in FIG. 7, the ejection of the carton has been completed and the lower suction cup 59 has been cammed to its uppermost position in which it presses the carton blank against the upper suction cup. As shown in FIG. 8, the lower suction cup has begun its descent (the vacuum on upper cup 58 now having been relieved) and has begun the positive opening of the carton wherein the downwardly facing trailing sidewall 25 of the carton moves into engagement with the curved portion 67 of the stationary guides 64. Meanwhile, the ejector blade 47 has begun its rearward stroke, and the suction cups 56 have begun to ascend to engage a fresh carton blank. As best illustrated in FIG. 2, during the descent of the lower portion of the blank, its leading and trailing side flaps 26 are spread apart by their engagement with spreader 4 and engage the vertical walls of an adjoining bucket and lie outside those walls so as to be held open until the product is inserted from the bucket into the carton. As can be seen in FIG. 4, the mova-

ble suction cup 59 has completed its descent, bringing the score line 60 into the vertex of the angle formed by the vertical and horizontal surfaces 68 and 69 of the guides 64 to complete the squaring-up of the carton and is momentarily held in this erected condition by the suction cup 59. Just prior to the release of the suction, and to hold the carton erected, the stabilizer 70 swings to an attitude wherein its free arm 72 overlies the carton (FIG. 5) and presents a horizontal surface engageable with the upper surface of the carton to hold the carton in erected condition until the transport lugs engage it to move it downstream. As also can be seen from FIG. 5, the forward edge of the carton is spaced slightly from the forward transport lug 37. At this stage, the rearward transport lug 38 has not completed its swing around the sprocket 113. As the rearward transport lug completes its swing around the sprocket 113, it swings the carton forward against the forward transport lug and, thus, captures the carton securely between the two lugs (FIG. 6). It should be appreciated that during this swinging movement, the carton is prevented from popping out of position between the two transport lugs by the overlying free arm 73 of the stabilizer 70 until the carton passes under the rail 74 overlying the transport conveyor.

#### THE ADJUSTABLE MAGAZINE

The adjustment features of the invention are focused on the desirability of thrusting a carton, regardless of its size, to a precise position with respect to the stationary guide 64 and the lower suction cup 59. The forward thrust of the carton should result in the score line 60 always attaining the same longitudinal position overlying the vertex formed between the horizontal and vertical surfaces 69 and 68 of the stationary guide. Transversely, the final ejected position of the carton should be such as to bring its side flaps 26 in the same relative position with respect to the buckets so that the downward opening movement of the carton will cause the side flaps to engage the bucket vertical walls 33A and 34A to hold them open.

The adjustable magazine is an important feature in this adjustment relation, for its must not only be adapted to accommodate cartons of varying sizes, but it must be adapted to position those carton blanks relative to the rest of the structure so that the thrust of the carton out of the magazine will bring the ejected carton to the position described above. As shown in FIG. 11, the magazine is opened to accommodate a large carton, shown in full lines. All elements of the magazine are adjustable to accommodate a very small carton in the position shown in broken lines at 120. All adjustments are made by knurled control knobs.

The magazine 45 is supported on a crossbar 121, which has plates 122 at its ends. The plates are slidably supported on fixed blocks 123, forming a part of the cartoner frame, and have slots 124 cooperating with knobs 125 to fix the longitudinal position of the magazine. The magazine has two vertical angle members 126 which form the forward corners of the magazine. The angle members 126 are supported on the cross bar 121 by slotted brackets 127 which are fixable by knobs 128. Thus, by sliding the angle member 126 toward or way from one another, the transverse dimension of the magazine can be varied. The magazine has a bottom portion formed by horizontal arms 130 and a vertical structure at its rear formed by vertical posts 131 which are integral with the horizontal arms 130. The arms 130 are also integral with plates 132 which are adjustably mounted on brackets 133 by means of slots 134 and knobs 135. The slot and knob combination provides transverse adjustment of the vertical posts and the horizontal members 130. Each bracket 133 is in turn adjustably mounted to a respective angle member 126 for longitudinal adjustment. The angle member 126 has a longitudinal keyway 137 which cooperates with a mating key 138 on the bracket. A knob 139 is threaded into the angle member 126 and cooperates with a slot 140 (FIG. 4) in bracket 133 at the keyway to fix the longitudinal position of the bracket 133.

Thus, the longitudinal position of the vertical posts can be varied to accommodate cartons of varying longitudinal dimensions.

Each bracket 133 carries the respective right- or left-hand carton guide 1, 2. Each carton guide has an arm 154 which extends rearwardly on the outside of the magazine and which is bolted to the bracket 133. Hence, adjustment of the bracket 133 carries with it an adjustment of the position of the right- and left-hand carton guides.

The right-hand carton guide 1 has a vertical wall 155 which supports the flap spreader 4 at its lower edge. The horizontal rail 3 is mounted on the vertical wall in a position which is approximately at the level of the lowermost carton in the stack and extends forwardly to a position alongside the vertical suction cup 58 (FIG. 13). Rail 3 has a rearward downwardly inclined extension 156 which provides a ramp which the carton tuck flap rides up as the carton is ejected from the magazine. The rearward extension 156 projects into the magazine and underlies the stack of cartons. Lying above the rearward extension is an inwardly projecting arm 157 which engages the leading side flap connected to the upwardly facing leading sidewall of the carton. The arm 157 does not project rearwardly a sufficient distance to engage the carton tuck flap. Accordingly, as the carton is ejected, the leading side flap rides on the arm 157, whereas the tuck flap passes below the arm 157 and rides up the rail 3. This prevents an engagement of the tuck flap with the side flap of the carton above it as a carton is being ejected.

The opposite or left-hand carton guide 2 is not illustrated in detail. It has a rail 3 with an inclined rearward extension, but it does not have or require a spreader 4 or the arm 157. It has a vertical wall 158 (FIG. 1) which extends lower than the lowermost extremity of the sidewall 155 of the right-hand carton guide. The wall 155 is engaged by the tuck flap of the carton as it is being opened and provides resistance against a lateral thrust of the carton as it rides over the spreader 4, thus maintaining the carton in lateral alignment until it is captured by the transport lugs.

The remaining adjustment is primarily to locate the forward carton stop 145 which is mounted on a horizontal arm 146 extending between the angle members 126. The arm 146 has two horizontal slots 147 which cooperate with knobs 148 to permit a transverse adjustment of the position of the stop 145. It can be observed from FIG. 11 that when a small carton is to be fed from the magazine, the top 145 must necessarily be moved a substantial distance to the left.

The stop 145 has a downwardly facing guide notch 150 through which the ejector blade 47 passes. Optionally, the magazine may have vertically extending pickets 151 which are adjustably mounted in the slots 147 by knobs 152.

Each of the adjustable elements cooperates with a scale fixed to its supporting element. Specific adjustment directions can be prepared for every dimension of carton within the capacity of the machine so that when an adjustment is to be made, the adjustable elements are simply moved to the positions set forth in the instruction book that correspond to the calibration on the respective scales.

When the adjustments are to be made to accommodate the cartoner to a different size of carton, the magazine is first adjusted as required by the carton dimensions. The single ejector blade is longitudinally adjusted by the slot and screws 50 and is transversely adjusted by the slot and screws 51. The stabilizer 70 may be adjusted vertically by means of its screw 61. No horizontal adjustment is required in view of the fact that the rearward position of the erected carton will always remain fixed because of the fixed position of the stationary guide.

The forward transport lug chain is adjusted to accommodate the new longitudinal dimension of the carton, and similarly the chain carrying the forward bucket element is adjusted to accommodate the new carton size and the smaller product. The chains may also be adjusted laterally to accommodate the change in the transverse dimension of the carton. Other adjustments of a minor nature may be required as, for example, the position and number of the suction cups 56.

I claim:

1. Apparatus for erecting cartons stacked in a magazine, each carton having opposed upper and lower major walls interconnected by an upwardly facing leading sidewall and a downwardly facing trailing sidewall, said apparatus comprising:

an upper suction cup,  
a lower suction cup movable vertically between an upper position in which it engages said lower major wall and a lower position in which said carton is open,  
means for thrusting a flat folded blank between said suction cups,  
guide means disposed adjacent to and rearwardly of said lower suction cup, said guide means being engageable by the trailing sidewall of said carton to swing said trailing sidewall toward a vertical orientation thereby at least partially erecting said carton as said lower suction cup draws said lower major wall downwardly,  
a stabilizer pivotally mounted adjacent to and rearwardly of said suction cups,  
said stabilizer having an arm pivotable to a horizontal position overlying said upper major wall to hold said carton in erected condition, and  
means for pivoting said stabilizer to bring said arm to said horizontal position as said lower cup is moved downwardly.

2. Cartoning apparatus comprising:

a magazine for supporting a stack of folded carton blanks, each having opposed upper and lower major walls interconnected by an upwardly facing leading sidewall and a downwardly facing trailing sidewall, said sidewalls having leading and trailing side flaps connected thereto,  
a transport conveyor adjacent said magazine and having a plurality of spaced pairs of leading and trailing transport lugs defining a plurality of carton carriers,  
a bucket conveyor having a plurality of spaced product buckets, each having a leading wall and a trailing wall, said buckets being conveyed in alignment with said carton carriers,  
an upper suction cup located between said magazine and transport conveyor,  
a lower cup located below said upper cup and movable vertically between an upper position in which it engages said lower major wall and a lower position in which said carton is open,  
means for thrusting a flat folded blank from said magazine between said cups,  
guide means disposed adjacent to and rearwardly of said lower suction cup, said guide means being engageable by the trailing sidewall of said carton to swing said trailing sidewall toward a vertical orientation thereby at least partially erecting said carton as said lower suction cup draws said lower major wall downwardly,  
said bucket conveyor having an upper reach which passes to one side of said guide means and at the same level as the upper reach of said transport conveyor,

said leading and trailing walls of each said bucket being engageable by said side flaps of said carton to hold open carton flaps as said carton sidewalls are swung downwardly.

3. Cartoning apparatus according to claim 2 further comprising:

right- and left-hand carton guides mounted laterally of said guide means, one of said guides, adjacent said bucket conveyor, having an inwardly projecting spreader engageable by said leading side flap to bend said side flap to permit it to slide ahead of the leading sidewall of the bucket as said carton sidewalls are swung downwardly.

4. Apparatus according to claim 2 further comprising:

a stabilizer pivotally mounted adjacent to and rearwardly of said suction cups,  
said stabilizer having an arm pivotable to a horizontal position overlying said upper major wall to hold said carton in erected condition, and  
means for pivoting said stabilizer to bring said arm to said horizontal position as said lower cup is moved downwardly.

5. Cartoning apparatus according to claim 4 further comprising:

a horizontal rail overlying said transport conveyor under which said cartons pass when opened, said rail extending forwardly from a point adjacent to the end of said horizontal stabilizer arm.

6. A cartoner having a transport conveyor for carrying cartons and a bucket conveyor for carrying products, said cartoner being adapted to accommodate a wide range of carton sizes,

an adjustable magazine located upstream of said conveyors for supporting a stack of flat folded carton blanks,  
an ejector mechanism located upstream of said magazine and having an adjustable ejector blade for ejecting cartons one at a time from the bottom of said stack,  
an erecting mechanism between said magazine and said conveyors and having a fixed guide and at least one suction cup to pull cartons ejected from said magazine against said guide to open them.

7. A cartoner according to claim 6 in which said guide is L shaped having a vertical leg presenting a vertical surface to engage a carton trailing sidewall and a horizontal leg presenting a horizontal surface to engage a carton major bottom wall.

8. A cartoner according to claim 7 in which the said vertical leg has a curved upper surface forming an extension of said vertical surface, said curved surface being initially engageable by said carton trailing sidewall.

9. The process of adjusting a cartoner according to claim 7 to receive cartons of varying sizes comprising the steps of:

adjusting the forward position of said magazine and the longitudinal position of said ejector blade to those positions which will permit the ejector blade to thrust a carton forward until said score line between the trailing sidewall and major bottom wall overlies a preselected fixed position.

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