

March 17, 1959

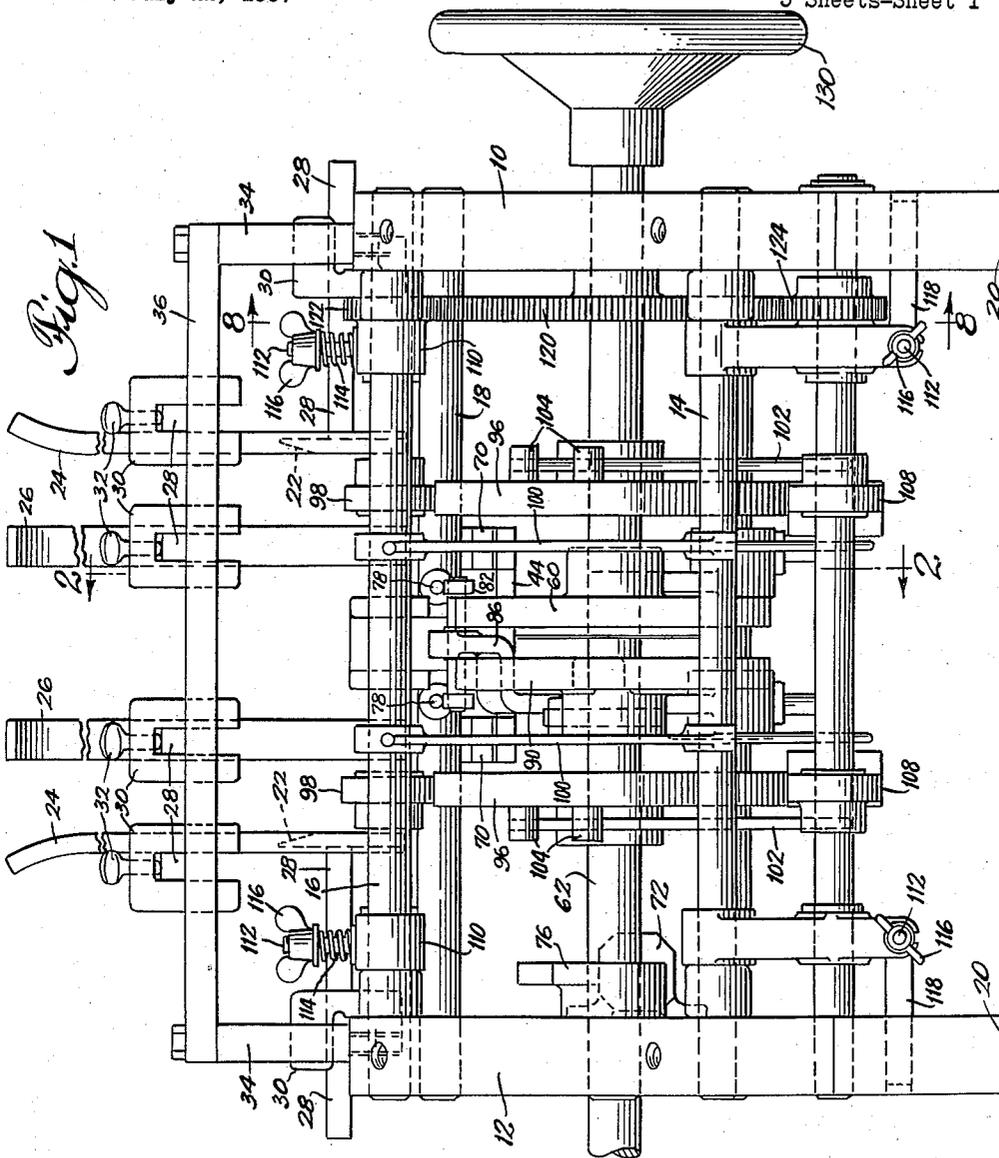
R. E. TAGGART

2,877,737

CARTON BLANK FEEDER AND GLUER

Filed July 22, 1957

5 Sheets-Sheet 1



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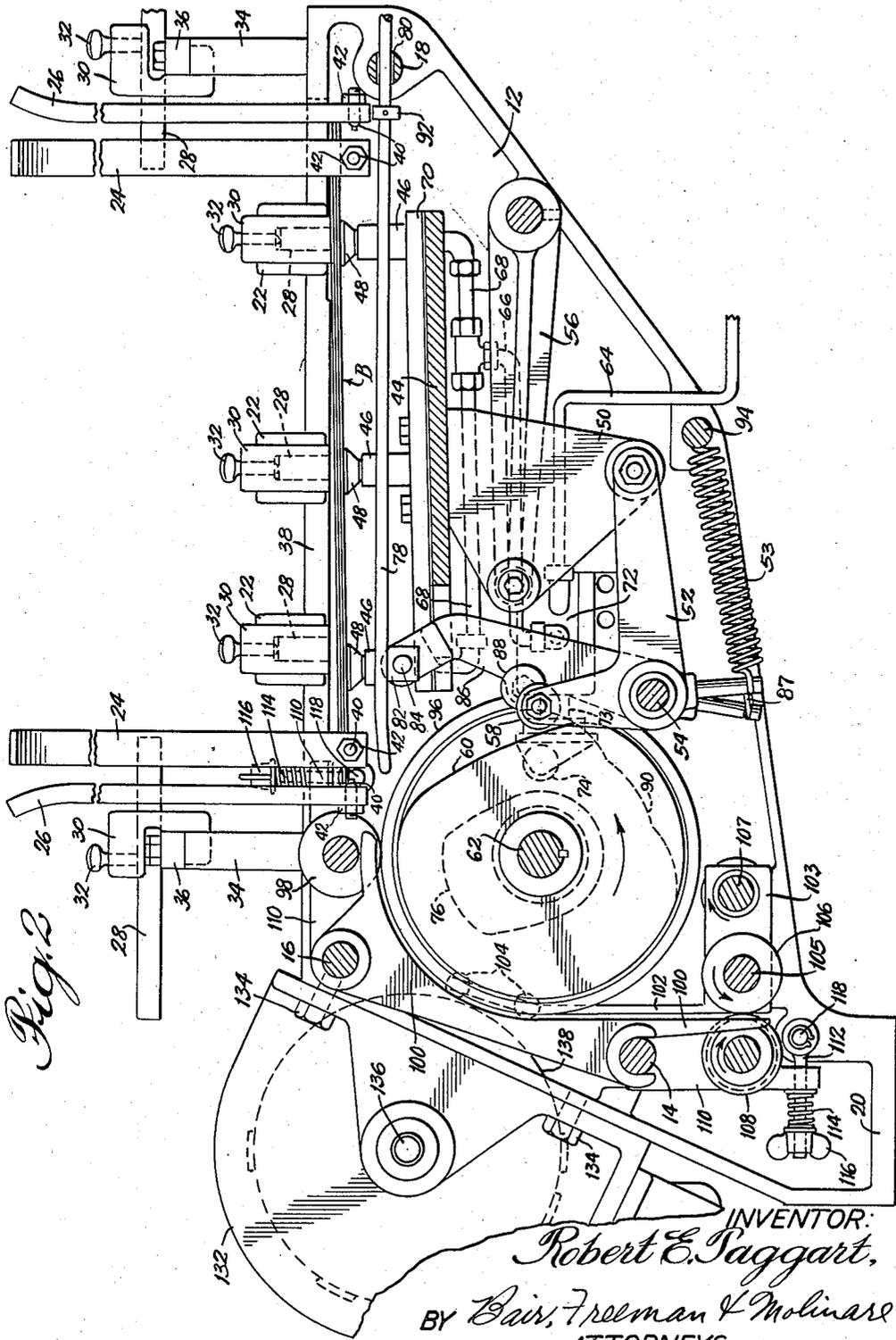
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CARTON BLANK FEEDER AND GLUER

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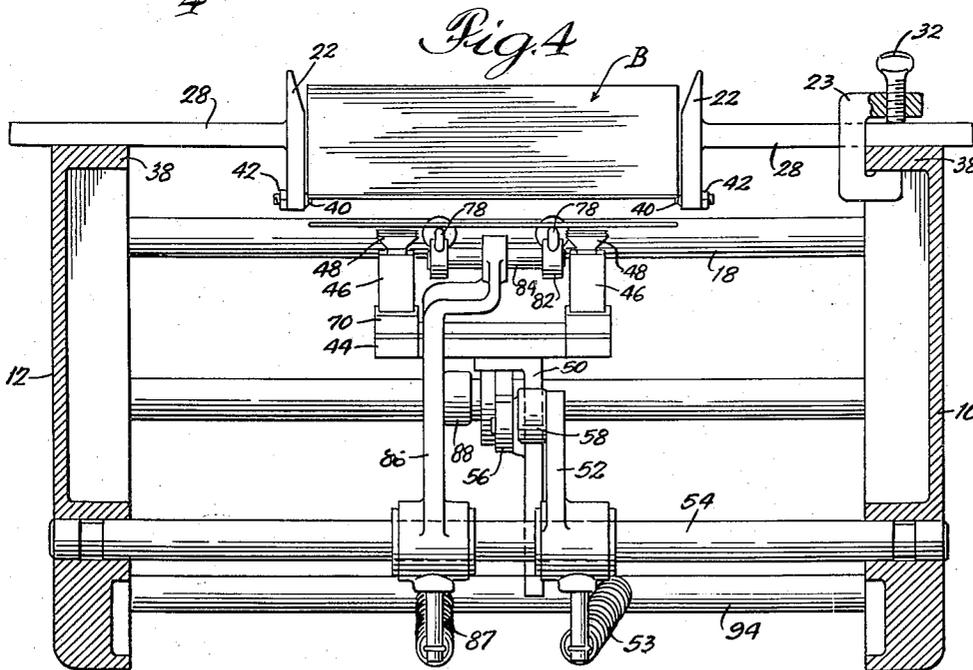
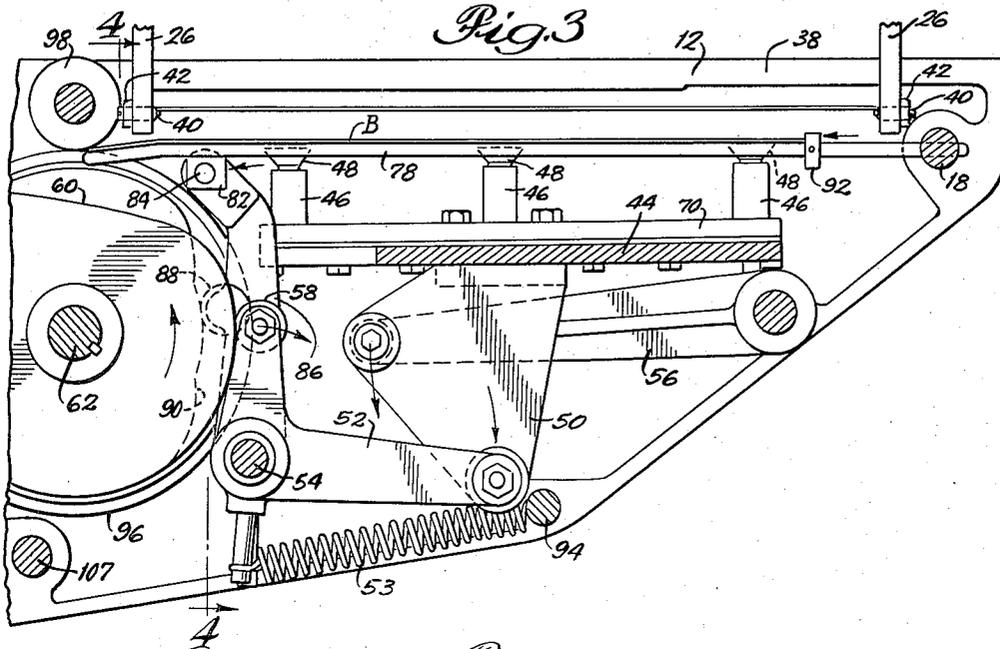
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CARTON BLANK FEEDER AND GLUER

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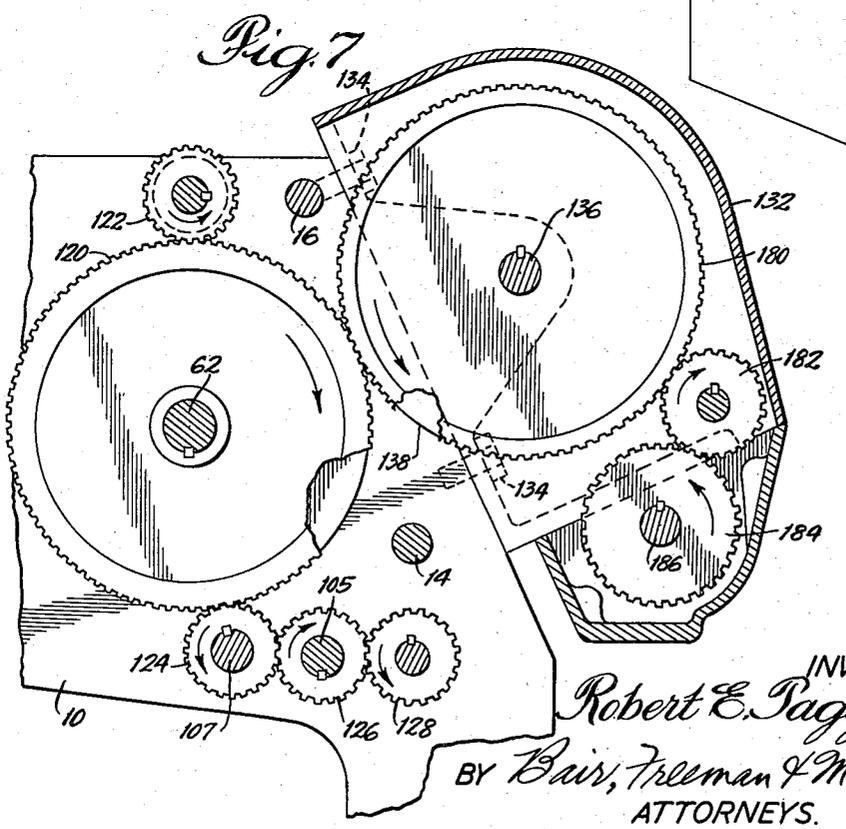
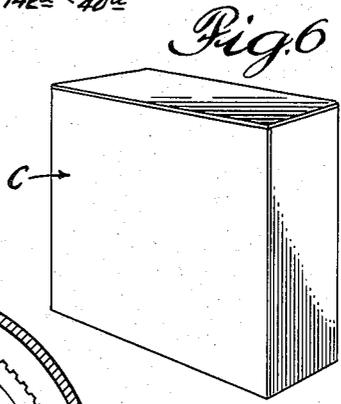
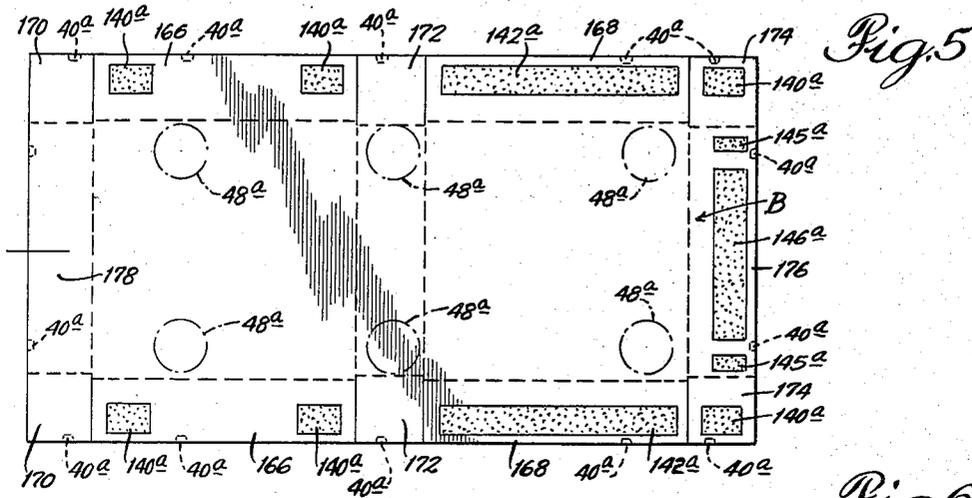
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CARTON BLANK FEEDER AND GLUER

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5 Sheets-Sheet 4



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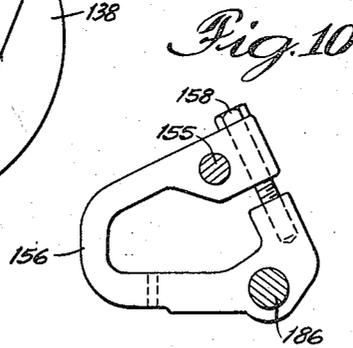
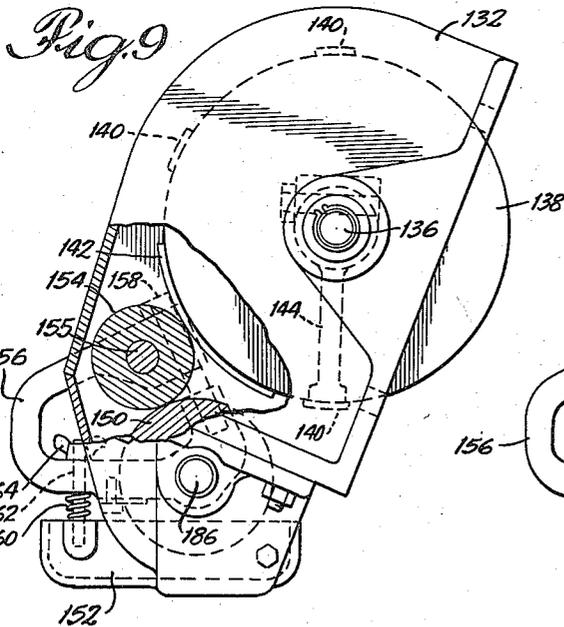
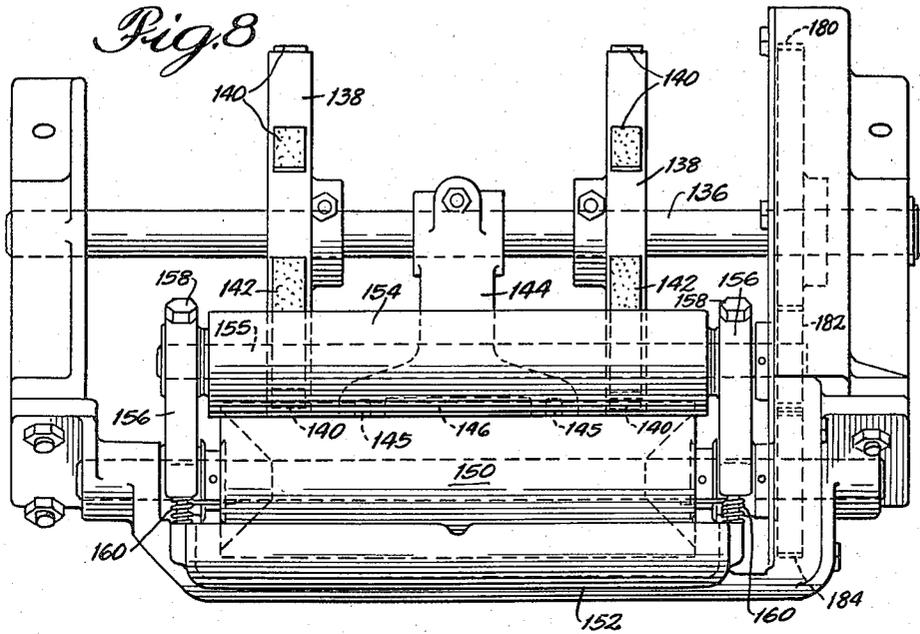
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CARTON BLANK FEEDER AND GLUER

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5 Sheets-Sheet 5



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2,877,737

CARTON BLANK FEEDER AND GLUER

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Application July 22, 1957, Serial No. 673,435

10 Claims. (Cl. 118—212)

This invention relates to a feeder and gluer for cartons such as butter and oleomargarine cartons, and is used in a cartoning machine wherein the carton blanks are supplied flat, the glue applied and the product then cartoned.

One object of the invention is to provide a machine of this character having a carton blank magazine for holding a stack of the flat carton blanks, and having means below the magazine for removing the lowermost carton blank only each cycle operation of the machine and positioning it properly for the forming thereof around the product after certain spots of glue have been applied to the blank for holding the carton glued together after it is so formed.

Another object is to provide a carton blank feeder which includes a vertically movable set of vacuum cups to engage the lowermost blank and lower it onto a horizontally movable feed frame, which frame then moves the blank into an assembly of opposed feed discs and draw rolls for picking up the leading edge of the blank and propelling the blank through a quarter turn from horizontal position to vertical position during which the glue spots are deposited at proper positions on the blank for subsequent gluing of the carton together after the product is wrapped therein.

Still another object is to provide a cam and lever arrangement for vertically reciprocating the vacuum cups and horizontally oscillating the feed frame in properly timed cycles of operation.

A further object is to provide feed discs for the blank around which the blank travels from horizontal to vertical position.

Still a further object is to provide a gluer associated with the feed disc and draw roll assembly and including gluing discs and a gluing arm opposing the feed discs for spotting the side flaps and the end flap respectively of the carton blank with spots of glue at desirable points for gluing the flaps closed after the product is wrapped in the carton by a cartoning machine to which my carton feeder and gluer is attached.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my carton feeder and gluer, whereby the objects above contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in detail on the accompanying drawings, wherein:

Fig. 1 is a rear end elevation of my carton feeder with the carton gluer removed;

Fig. 2 is a vertical sectional view thereof on the line 2—2 of Fig. 1;

Fig. 3 is a view similar to a portion of Fig. 2 showing the parts in a different position;

Fig. 4 is a vertical sectional view on the line 4—4 of Fig. 3;

Fig. 5 is a plan view of a carton blank with glue spots indicated thereon as applied by my carton gluer;

Fig. 6 is a perspective view of the carton in closed condition after the product has been cartoned therein;

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Fig. 7 is a side elevation of the reverse side of the left half of Fig. 2 showing a housing for the gears of the carton gluer in vertical cross section;

Fig. 8 is an end elevation of the carton gluer detached from the carton feeder;

Fig. 9 is a side elevation thereof similar to Fig. 2 and with portions of the carton gluer broken away and other portions thereof shown in vertical cross section, Fig. 8 being a view looking at the left side of Fig. 9; and

Fig. 10 is a side elevation of an adjustable glue transfer roll support which I use in my carton gluer.

On the accompanying drawings I used the reference numerals 10 and 12 to indicate side frames which are connected by cross rods 14, 16 and 18 to form a frame work for my carton feeder and a support for my carton gluer. The side frames 10 and 12 are provided with feet 20 which are attached to a butter cartoning machine of usual construction (not shown).

I provide a carton blank magazine in the form of carton blank guides 22, 24 and 26, there being six of the guides 22, four of the guides 24 and four of the guides 26, making a total of 14. This number, however, may be varied depending on the size and weight of material in the carton blanks. A supporting bar 28 is welded to each carton guide 22, 24 and 26 and these bars are supported by means of clamps 30 and clamp screws 32. The clamps 30 for the carton guides 22 coact with flanges 38 of the side frames 10 and 12 while the clamps for the carton guides 24 and 26 coact with a cross bar 36 supported by a pair of posts 34 on the side frames 10 and 12. The clamp and clamp screw arrangement provides for desirable adjustment of the placement of the carton blank guides 22, 24 and 26 to suit the size of blank being held in the magazine. Each of the carton blank guides has a supporting screw 40 which has a reduced inner end to support the stack of cartons as shown in Fig. 4 and these screws are adjusted relative to the guides, lock nuts 42 being provided to retain the adjustment.

Referring to Fig. 2, a platform 44 is provided from which posts 46 extend upwardly (six are illustrated) and at the top of each post is a vacuum cup 48 of neoprene or the like. A bracket 50 is secured to the underside of the platform 44 for supporting the platform and pivoted to this bracket is a bell crank 52 and a link 56. The bell crank 52 is oscillatable on a shaft 54 and carries a cam follower roller 58 which coacts with a platform cam 60 on a cam shaft 62. A spring 53 is provided to normally retain the roller 58 in contact with the cam 60. The spring is anchored to a cross rod 94.

Vacuum lines 64, 66 and 68 are provided, the line 64 extending from a suitable vacuum pump and the line 66 being connected to the line 64 by means of a vacuum valve 72. The line 68 connects the line 66 to opposite ends of a manifold 70 from which the vacuum connections are made through the posts 46 to the vacuum cups 48. The valve 72 has a stem 73 carrying a cam follower roller 74 adapted to coact during a certain segment in the cycle of operations with a vacuum valve cam 76 on a cam shaft 62.

A pair of carton supporting rods 78 are provided and these are reciprocally mounted by being slidable through holes 80 in the stationary cross rod 18 and are provided with brackets 82 at their forward ends supported on a pin 84. The pin 84 is supported by the upper end of an arm 86 pivoted on a stationary shaft 54 and carries a cam follower roller 88 adapted to coact with a supporting rod cam 90 on the cam shaft 62. A spring 87 is connected between the cross rod 94 and the arm 86 to bias the roller 88 into engagement with the cam 90. A collar 92 is provided on each rod 78 adjacent the rear end thereof for a purpose which will hereinafter appear.

A pair of feed discs 96 are provided for the carton.

blank, and an opposing draw roll 98 contacts the upper portion thereof. A pair of carton blank guide brackets 100 serve to bend the carton blank around the feed discs 96 and these brackets are supported on the cross rod 14 and 16 as shown in Fig. 2. Adjacent the lower ends of the brackets 100 are a pair of carton blank guide rods 102 having their lower ends supported on plates 103. These plates in turn are perforated to receive shafts 105 and 107 whereby the plates are supported. Knobs 104 on the rods 102 serve to engage the blank and impart a degree of stiffness thereto for the gluing operation as will hereinafter appear. A pair of draw rolls 106 are provided and opposing draw rolls 108 draw the carton blank downwardly from between the guides 100 and 102. Both of the rolls 98 and 108 are spring biased toward their respective feed discs and draw rolls 106 by being carried by arms 110 pivoted on the cross rods 16 (Fig. 1) and 14 (Fig. 2) respectively and provided with springs 114 under wing nuts 116 on screw eyes 112 which are anchored to the side frames 10 and 12 by stationary pins 118.

Driving means is provided for the draw roll 98 and the draw rolls 106 and 108, as shown in Fig. 7, by means of a gear 120 on the cam shaft 62 meshing with a pinion 122 for the roll 98 and an idler pinion 124 on the shaft 107. Pinions 126 (on shaft 105) and 128 for the draw rolls 106 and 108 respectively mesh with each other, and the pinion 126 meshes with the idler pinion 124. The pitch diameters of the gear 120 and the pinions 122, 126 and 128 match the diameters of the feed disc 96 and the draw rolls 98, 106 and 108 respectively for proper feeding of the carton blank and the orienting thereof from a horizontal to a vertical position as it passes through the guides 100 and 102.

The cam shaft 62 is driven by any suitable means (not shown) to rotate once each cycle of operation of a cartoning machine to which my carton feeder and gluer is attached. The timing of the lands 140, 142, 145 and 146 as they engage the carton blank is accomplished through a gearing arrangement which drives the glue applicator discs 138, the glue roll 150 and the glue transfer roll 154. For this purpose I provide a gear 180 on the glue applicator shaft 136 (see Fig. 7) meshing with the gear 120, a pinion 182 meshing therewith for driving the transfer roll 154 and a pinion 184 meshing with the pinion 182 for driving the glue roll 150. A hand wheel 130, as shown in Fig. 1, is provided to operate the carton feeder and gluer by hand for checking its operation when desired.

My carton gluer comprises a gluer housing 132 secured to the side frames 10 and 12 as by cap screws 134. A glue applicator shaft 136 is journaled in the housing and has thereon a pair of glue applicator discs 138 opposing the feed discs 96. Each glue applicator disc 138 has two small glue applying lands 140 and a relatively long glue applying land 142. There is also an arm 144 on the shaft 136 having a pair of small glue applying lands 145 and a relatively long one indicated 146. The various lands 140, 142, 145 and 146 apply glue in patterns indicated 140a, 142a, 145a and 146a on the carton blank B as shown in Fig. 5. Also, in this figure a pattern for the supporting screws 40 is shown at 40a, and the positions of the vacuum cups are indicated at 48a.

A glue roller 150 dips into a glue pot 152 (Fig. 9) for picking up glue therefrom and the glue is transferred to a transfer roll 154 which contacts the lands 140, 142, 145 and 146 as they pass by the roller 154. The roller 154 is carried by a shaft 155 supported in U-brackets 156 having adjusting screws 158 for springing the arms of the brackets closer together for additional pressure of the transfer roller 154 on the glue roller 150. The arms 156 are pivotally mounted on the shaft of the glue roller. The arms are spring urged at 160, thus tending to engage the roller 155 with the lands 140, 142, 145 and 146 under spring pressure, and the pressure may be adjusted by wing nuts 164 on threaded studs 162 passing through the springs 160.

Practical operation

In the operation of my carton feeder and gluer, the platform 44 is elevated as to the position shown in Fig. 2 for contact of the vacuum cups 48 with the lowermost carton blank B whereupon the valve 72 is opened for applying vacuum to the vacuum cups. The cups pull the lowermost carton blank off the supporting screws 40 as the platform lowers to the position shown in Fig. 3 whereupon the vacuum valve 72 closes. The carton blank is now supported on the supporting rods 78. These rods are moved forwardly so that the collars 92 engage the rear edge of the blank as shown and move its leading edge between the rotating feed discs 96 and the opposed draw rolls 98. Thereupon these discs and rolls will draw the carton from the supporting rods and project it between the guide brackets 100 and the guide rods 102 so as to orient the carton from the horizontal plane into the vertical plane. When the lower edge of the carton reaches the draw rolls 106 and 108 they will draw the carton from between the guides 100 and 102 and feed it downwardly into the wrapping machine in a vertical position to be engaged by the product and thereafter folded by the cartoning machine mechanism (not shown) around the product to produce the filled and closed carton C of Fig. 6.

During the passage of the carton blank between the guide knobs 104 and the guides 100, the spots 140a, 142a, 145a and 146a of glue are applied to the blank in the positions indicated in Fig. 5 so that subsequently in the cartoning machine two of the spots 140a on side flaps 166 of the blank will engage end flaps 170 and 172, after which the side flaps 168 are folded over the flaps 166 and the spots 142a fasten the side flaps together. The spots 146a on the closure flap 176 coact with the opposite closure flap 178 and finally the spots 140a on end flaps 174 are contacted with the flaps 168 to seal the package in closed condition as in Fig. 6.

During the application of the glue, the discs 120 back up the carton blank for the lands 140 and 142. There is no backing for the lands 145 and 146 but since the carton blank is curved by its passage around the discs 120 and between the guides 100 and 102, it presents sufficient stiffness for this purpose. The knobs 104 also help by providing additional support for the curved portion of the blank to which the glue spots 145a and 146a are applied.

From the foregoing description it will be obvious that I have provided a carton feeder and gluer which effectively removes one carton blank at a time from beneath a stack of cartons by the use of a vacuum gripping means for the blank and properly feeds the blank and applies glue thereto, all in timed relation during a cycle of operations so as to deliver a carton blank in a vertical position for cartoning a product such as butter or oleomargarine in a standard cartoning machine. The parts are designed to apply predetermined glue patterns to the carton blank in such a way that the glue is not smeared out of position during the operation nor when the flaps of the carton are closed.

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

I claim as my invention:

1. In a carton feeder and gluer for a cartoning machine, means for supporting the marginal edges of a stack of flat carton blanks, a feeder frame, means for moving said frame upwardly and downwardly, vacuum cups carried by said frame for engaging the lowermost carton blank when said frame is moved upwardly, a support for said carton blank, said vacuum cups depositing the blank on said support as said frame is moved

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downwardly, said support being reciprocable and having means to engage one edge of the blank for projecting the other edge thereof when said support is reciprocated in one direction, feed discs and opposing draw rolls to receive said projected edge of said blank, means for rotating said feed discs and said draw rolls for picking up said carton blank from said support and withdrawing it therefrom, a set of draw rolls for discharging said carton blank to a cartoning position, and means for spotting said blank with glue as the blank is advanced by said feed discs and draw rolls.

2. In a carton feeder and gluer for a cartoning machine, means for supporting the marginal edges of a stack of flat carton blanks, a feeder frame means for moving said frame upwardly and downwardly, vacuum cups carried by said frame for engaging the lowermost carton blank when said frame is moved upwardly, a support for said carton blank, said vacuum cups depositing the blank on said support as said frame is moved downwardly, said support being reciprocable and having means to engage one edge of the blank for projecting the other edge thereof when said support is reciprocated in one direction, feed discs and opposing draw rolls to receive said projected edge of said blank, means for rotating said feed discs and draw rolls for picking up said carton blank from said support and withdrawing it therefrom, a curved guide adjacent said feed discs for changing the course of the blank from substantially horizontal to substantially vertical, a set of draw rolls for discharging said carton blank to a cartoning position, and means for spotting said blank with glue as the blank is advanced past said guide element by said feed discs and draw rolls.

3. In a carton feeder and gluer for a cartoning machine, means for supporting the marginal edges of a stack of flat carton blanks, a feeder frame, means for moving said frame upwardly and downwardly, vacuum cups carried by said frame for engaging the lowermost carton blank when said frame is moved upwardly, a support for said carton blank, said vacuum cups depositing the blank on said support as said frame is moved downwardly, and means for moving the blank off said support and spotting it with glue.

4. In a carton feeder and gluer for a cartoning machine, means for supporting the marginal edges of a stack of flat carton blanks, a feeder frame, means for moving said frame upwardly and downwardly, vacuum cups carried by said frame for engaging the lowermost carton blank when said frame is moved upwardly, a support for said carton blank, said vacuum cups depositing the blank on said support as said frame is moved downwardly, said support being reciprocable and having means to engage one edge of the blank for projecting the other edge thereof when said support is reciprocated in one direction, feed discs and opposing draw rolls to receive said projected edge of said disc, means for rotating said feed discs and draw rolls for picking up said carton blank from said support and withdrawing it therefrom, a set of draw rolls for discharging said carton blank to a cartoning position, and means for spotting said blank with glue as the blank is advanced by said feed discs, said means comprising a glue pot, a glue roller rotatable therein, a transfer disc receiving glue from said glue roller, said transfer disc having elevated portions spaced around its periphery, said portions being the only portions thereof receiving glue from said glue roller and thereby transferring a glue pattern to said carton blank, and a transfer arm for the closure flap of the carton blank having raised portions for providing a predetermined glue pattern on said closure flap.

5. In a carton feeder and gluer for a cartoning machine, means for supporting the marginal edges of a stack of flat carton blanks, a feeder frame, means for moving said frame upwardly and downwardly, vacuum cups carried by said frame for engaging the lowermost carton blank when said frame is moved upwardly, a vacuum

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valve pneumatically connected with said vacuum cups and opened while said feeder frame is in raised position and during the lowering thereof, a support for said carton blank, said vacuum cups depositing the blank on said support as said frame is moved downwardly whereupon said vacuum valve is closed, said support being reciprocable and having means to engage one edge of the blank for projecting the other edge thereof when said support is reciprocated in one direction, feed discs and opposing draw rolls to receive said projected edge of said blank, means for rotating said feed discs and draw rolls for picking up said carton blank from said support, withdrawing it therefrom and changing its course substantially 90°, a set of draw rolls for discharging said carton blank to a cartoning position, and means for spotting said blank with glue as the blank is advanced by said feed discs and draw rolls and during the time its course is being changed.

6. A carton feeder and gluer comprising means for supporting the marginal edges of a stack of carton blanks, a feeder frame, means for moving said frame upwardly and downwardly, vacuum cups carried by said frame for engaging the lowermost carton blank when said frame is moved upwardly, a support for said carton blank, said vacuum cups depositing the blank on said support as said frame is moved downwardly, said support having means to engage one edge of the blank for projecting the other edge thereof when said support is moved in one direction, feed discs and opposing draw rolls to receive said projecting edge of said blank, means for rotating said feed discs and draw rolls for picking up said carton blank from said support and withdrawing it therefrom, a set of draw rolls for discharging said carton blank to a cartoning position, and means for spotting said blank with glue as the blank is advanced by said feed discs, said means comprising a glue pot, a glue roller rotatable therein, a transfer roller engaging said glue roller, a transfer disc receiving glue from said transfer roller, said transfer disc having elevated portions spaced around its periphery, said portions being the only portions thereof receiving glue from said transfer roller and thereby transferring a glue pattern to said carton blank, and a transfer arm for the closure flap of the carton blank having raised portions for providing a predetermined glue pattern on said closure flap.

7. In a carton feeder and gluer for a cartoning machine, means for supporting the marginal edges of a stack of flat carton blanks, a feeder frame, means for moving said frame upwardly and downwardly comprising a cam shaft, a cam thereon, pivoted arms for supporting said feeder frame, one of said arms having a roller contacting said cam for imparting pivotal movement to the arms, vacuum cups carried by said frame for engaging the lowermost carton blank when said frame is moved upwardly, a support for said carton blank, said vacuum cups depositing the blank on said support as said frame is moved downwardly, said support being reciprocable and having means to engage one edge of the blank for projecting the other edge thereof when said support is oscillated in one direction, means for imparting reciprocating movement to said carton support comprising a cam on said cam shaft and an arm cooperating therewith, said arm being pivoted at one end and supporting one end of said support at its opposite end, the other end of said support being slidably mounted, feed discs on said cam shaft and opposing draw rolls to receive said projected edge of said blank, means for rotating said cam shaft and said draw rolls for picking up said carton blank from said support and withdrawing it therefrom, a set of draw rolls for discharging said carton blank to a cartoning position, and means for spotting said blank with glue as the blank is advanced by said feed discs and draw rolls.

8. A carton feeder and gluer comprising means for supporting the marginal edges of a stack of carton blanks,

a feeder frame, means for moving said frame upwardly and downwardly, vacuum cups carried by said frame for engaging the lowermost carton blank when said frame is in raised position, a support for said carton blank, said vacuum cups depositing the blank on said support as said frame is lowered, means for applying vacuum to said cups only while in said raised position and while they are moved downwardly, said support having means to engage one edge of the blank for projecting the other edge thereof when said support moves in one direction, feed discs and opposing draw rolls to receive said projected edge of said blank, means for rotating said feed discs and draw rolls for picking up said blank from said support and withdrawing it therefrom, a second set of draw rolls for discharging said carton blank to a cartoning position, and means for spotting said blank with glue as the blank is advanced by said feed discs, said means including a transfer disc having elevated portions spaced around its periphery, said portions being the only portions thereof receiving glue and transferring a glue pattern to said carton blank, and a transfer arm for the closure flap of the said carton having raised portions for providing a predetermined glue pattern on said closure flap.

9. A carton feeder and gluer comprising means for supporting the marginal edges of a stack of carton blanks, a feeder frame, means for imparting up and down movement to said frame comprising a cam shaft, a cam thereon, pivoted arms for supporting said feeder frame, one of said arms having a roller contacting said cam for imparting pivotal movement to the arms, vacuum cups carried by said frame for engaging the lowermost carton blank when said frame is in raised position, a support for said carton blank, means for imparting reciprocating movement to said carton support comprising a cam on said cam shaft and an arm cooperating therewith, said arm being pivoted at one end and supporting one end of said support at its opposite end, the other end of said support being slidably mounted, said vacuum cups depositing the blank on said support as said frame is lowered, means for applying vacuum to said cups only

while in said raised position and while they are moved downwardly, said support having means to engage one edge of the blank for projecting the other edge thereof when said support moves in one direction, feed discs and opposing draw rolls to receive said projected edge of said blank, means for rotating said feed discs and draw rolls for picking up said blank from said support and withdrawing it therefrom, a second set of draw rolls for discharging said carton blank to a cartoning position, and means for spotting said blank with glue as the blank is advanced by said feed discs, said means including a transfer disc having elevated portions spaced around its periphery, said portions being the only portions thereof receiving glue and transferring a glue pattern to said carton blank, and a transfer arm for the closure flap of the carton having raised portions for providing a predetermined glue pattern on said closure flap, said transfer disc and transfer arm being driven in timed relation to said feed discs to synchronize the glue patterns with the discharge of carton blanks by said feed discs and draw rolls.

10. In a carton feeder and gluer for a cartoning machine, means for supporting the marginal edges of a stack of flat carton blanks, a feeder frame, means for imparting up and down movement to said frame comprising a cam shaft, a cam thereon, pivoted arms for supporting said feeder frame, one of said arms having a roller contacting said cam for imparting pivotal movement to the arms, vacuum cups carried by said frame for engaging the lowermost carton blank when said frame is moved upwardly, a support for said carton blank, said vacuum cups depositing the blank on said support as said frame is moved downwardly, said support being reciprocable, means for moving the blank off said support, said last means comprising a cam on said cam shaft and an arm cooperating therewith, said arm being pivoted at one end and supporting one end of said support, the other end of said support being slidably mounted, and means for spotting the blank with glue.

No references cited.