Dec. 1, 1959 L. McGIHON 2,915,309

CARTON FEED MECHANISM

Filed June 11, 1956

4 Sheets-Sheet 1

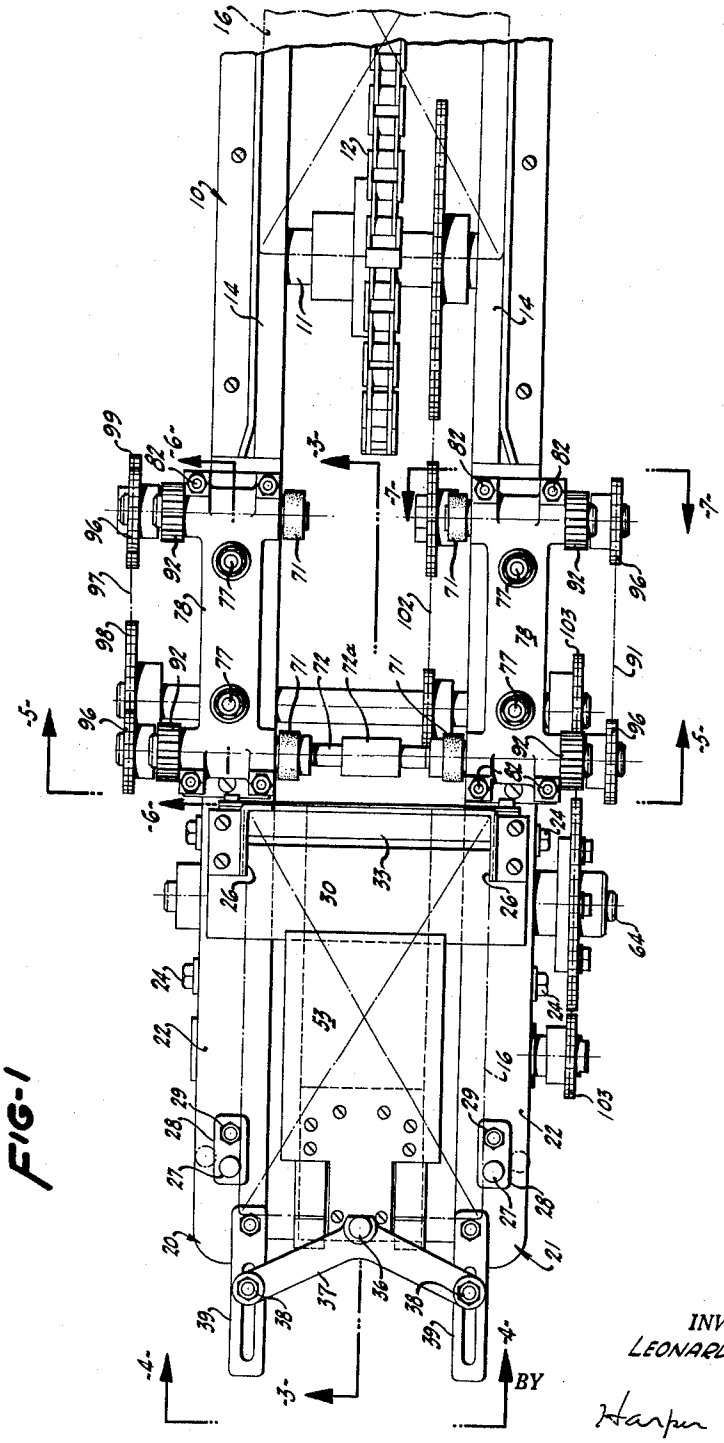


FIG-1

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Dec. 1, 1959 L. McGIHON 2,915,309

CARTON FEED MECHANISM

Filed June 11, 1956 4 Sheets-Sheet 2

FIG. 2

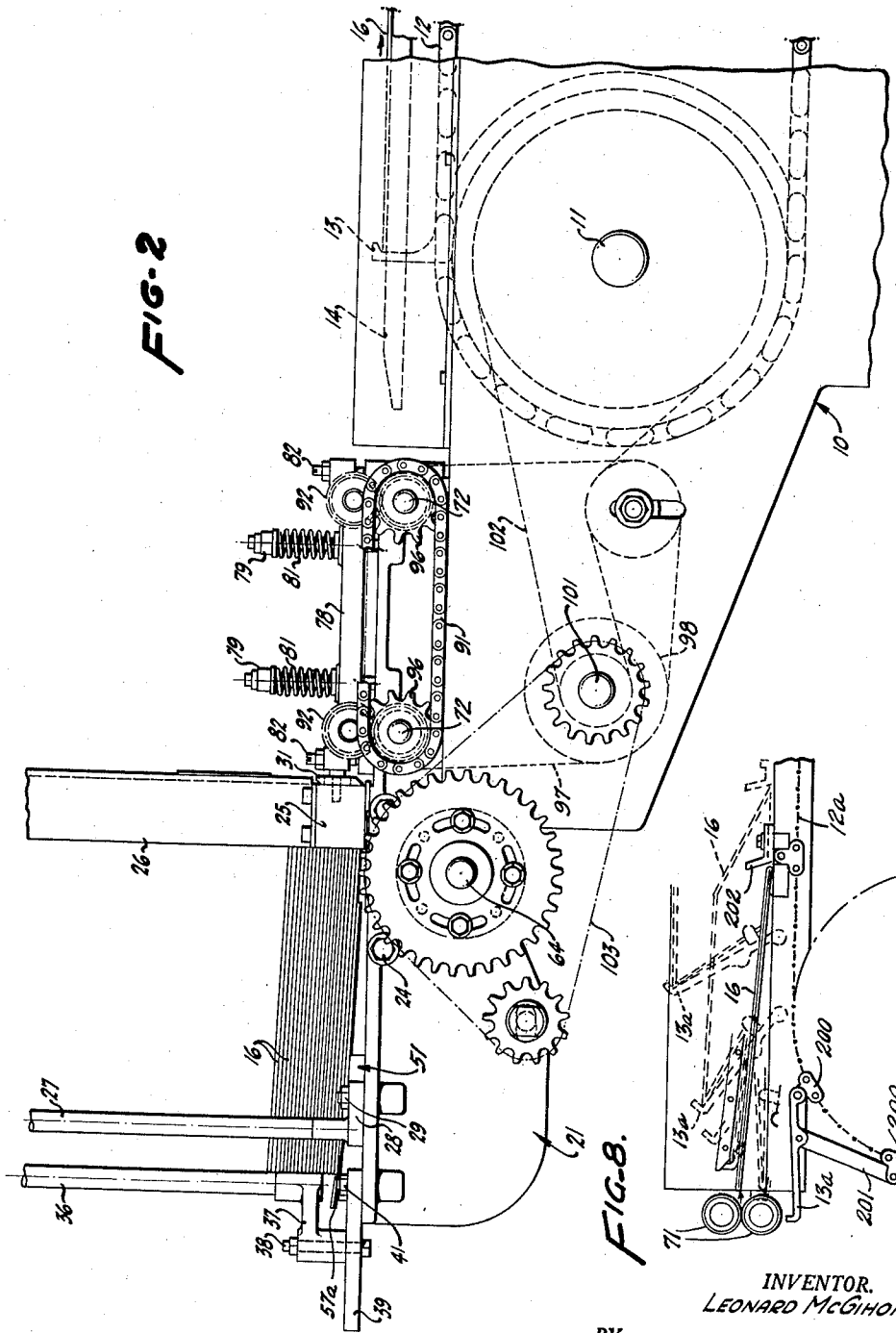


FIG. 8.

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Dec. 1, 1959 L. McGIHON 2,915,309

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4 Sheets-Sheet 3

FIG-3

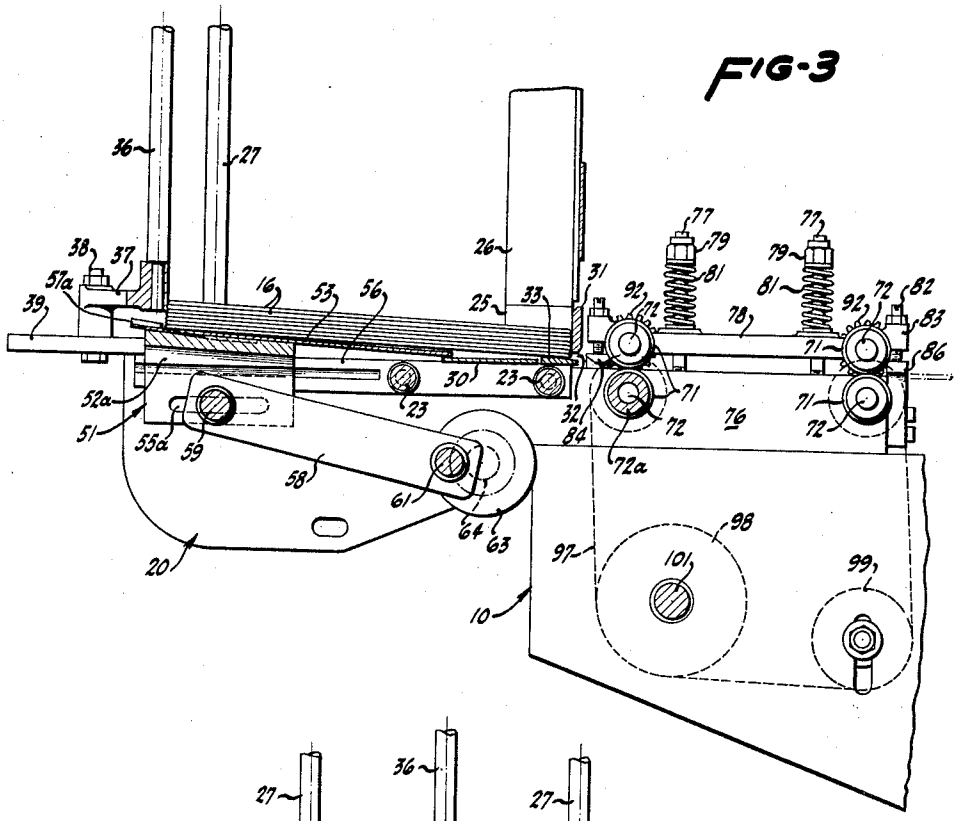
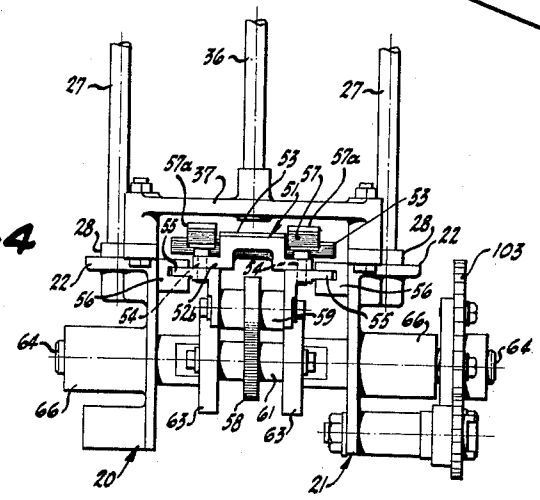


FIG-4



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Dec. 1, 1959 L. McGIHON 2,915,309

CARTON FEED MECHANISM

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4 Sheets-Sheet 4

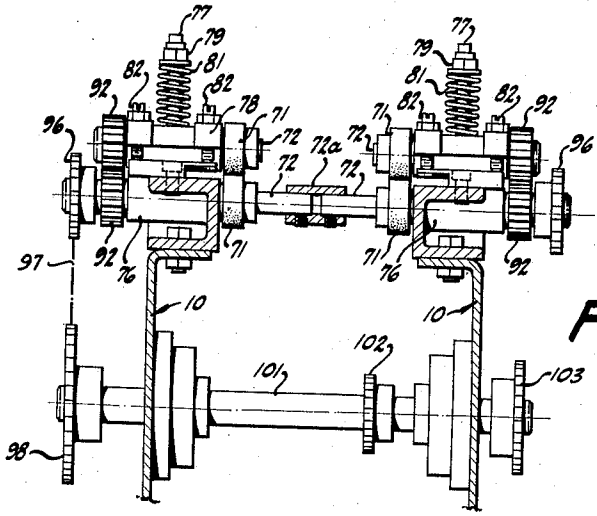


FIG-5

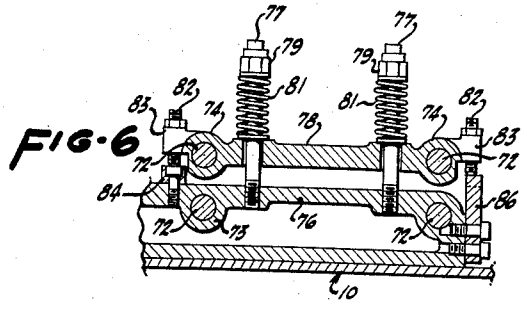


FIG-6

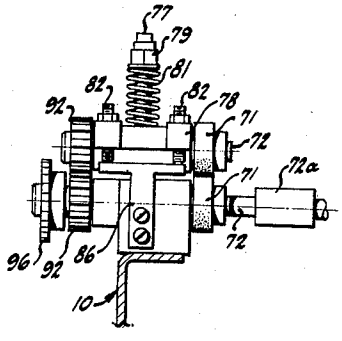


FIG-7

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United States Patent Office 2,915,309 Patented Dec. 1, 1959

2,915,309

CARTON FEED MECHANISM

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Application June 11, 1956, Serial No. 590,547

4 Claims. (Cl. 271—10)

The present invention relates to feed mechanisms for supplying cartons one at a time from a stack of cartons to a machine for erecting, filling and closing the cartons automatically. The invention is concerned more particularly with an improved feed mechanism of the above character which is reliable in operation, which effects a carton-by-carton feed without interruption due to irregularities in the cartons, and which is adjustable to accommodate different lengths of cartons.

The above and other objects of the invention are attained as described in the accompanying specification, taken in conjunction with the attached drawings, in which:

Figure 1 is a plan view of a feed mechanism of the above character.

Figure 2 is a side elevational view of the feed mechanism shown in Figure 1.

Figure 3 is a longitudinal sectional view taken generally in a plane indicated by line 3—3 in Figure 1.

Figure 4 is an end view taken as indicated by the line 4—4 in Figure 1.

Figure 5 is a transverse sectional view taken in a plane indicated by the line 5—5 in Figure 1.

Figure 6 is a fragmentary sectional view taken in a plane indicated by the line 6—6 in Figure 1.

Figure 7 is a fragmentary transverse sectional view taken as indicated by line 7—7 in Figure 1.

Figure 8 is a schematic view illustrating a modified form of the invention, being taken similarly to a portion of Figure 2.

The carton erecting, closing and filling machine with which the instant invention is associated may be of the type described and claimed in my co-pending application Serial No. 485,943, filed February 3, 1955 for Carton Feeding, Erecting, Filling and Closing Mechanism, to which reference is made for a complete disclosure of this machine. For the purposes of the present invention it is sufficient to understand that the machine includes opposite frame members **10** which are suitably connected together and in which a transverse shaft **11** is journaled to carry a feed chain **12** for a series of carton progressor elements or fingers **13** thereon which pass between a pair of tracks **14** on the opposite frame members **10** respectively. In Figures 1 and 2 a carton **16** is shown on the tracks **14** and being carried through the machine after being fed thereon from the feed mechanism about to be described.

The feed mechanism includes a pair of opposite similar auxiliary frame castings **20**, **21** which may be suitably bolted to the side members **10** of the machine and each of which at its top has a horizontal longitudinally extended flange **22** which serves to support the various parts of the feed mechanism including the storage hopper for a stack of cartons. The frame castings **20** and **21** are connected in spaced relation by a pair of spacer rods **23** secured by cap screws **24**.

The hopper for the stack of cartons includes a pair of angle shaped uprights **26** (Figures 1, 2 and 3) having a bottom flange bolted to the respective rectangular blocks

25 secured over flanges **22**, a pair of opposite upright posts **27** spaced from the angle shaped uprights **26** and adapted to engage the opposite sides of the closed carton blanks **16**. Each post **27** extends upwardly from a base bracket **28** which is pivotally mounted and adjustably clamped in place on one of the top flanges **22** by a bolt and nut mechanism **29**. As seen in Figure 1 by swinging the base brackets **28** the adjustment of the posts **27** with respect to a carton may be made. In general the adjustment to the width of different cartons is effected by varying the spacing between the opposite frame members **10** and by replacing various cross members with members of the appropriate length.

To confine the cartons length when below the brackets **26**, at the discharge end of the hopper, a transverse plate **31** (Figure 3) is provided which is adjustably secured for vertical adjustment to the blocks **25** so that a gap **32** between the transverse member **31** and a horizontal carton support plate **33** can be adjusted to accommodate the thickness of one carton blank. The plate **33** is interposed between the blocks **25** and the flanges **22** adjacent a support plate **30**. At the other end of the carton blanks an upright post **36** is provided carried in spaced relation from the upper surface the frame casting **21** by a transverse support member **37** which is adjustably secured by bolt and nut mechanism **38** on a slotted arm **39** secured by a cap screw **41** to the respective flanges **22** of the frame brackets.

Means are provided for effecting a carton by carton feed from the bottom of the stack of the cartons and this means includes a slide structure **51** including a casting **52***a* to which a carton support plate **53** is secured, and opposite flanges **52***b* disposed in a lower plane than the top surface **52***a* and apertured to pass fastening screws **54** for two opposite angle shaped guide members **55**. The horizontal flanges of the guide members **55** are received in opposite track members **56** for horizontal sliding movement. At either side of the carton-supporting surface **52***a* a pair of spring arms **57** are provided having thereon at their rearward ends feed blocks **57***a* of a thickness to engage the lowermost carton **16** of the stack.

For operating the feed structure **51** there is provided a crank arm or link **58** adjustably secured in the slotted sides **55***a* of the slide structure by a transverse clamping member **59**. At the opposite end the connecting link **58** is connected to a cross shaft **61** extending between two eccentrics **63** carried by respective shafts **64** in bosses **66** of the side castings **20** and **21**. Upon each rotation of the eccentrics **63** the feed blocks **57** will pick up the lowermost carton and project it forwardly or to the right as seen in Figure 3 for the extent of feed of the eccentrics, and thus serve to engage this carton blank with feed mechanism about to be described. As seen in Figures 1, 2 and 5, two pairs of spaced feed rollers **71** are provided carried by respective shafts **72** in fixed lower bosses **73** and in movable upper bosses **74**. As seen in Figure 6 the lower fixed bosses **73** at each side of the machine are carried in a frame bracket **76** on a side frame member **10** of the machine and this frame bracket **76** carries a pair of fixed shafts **77** projecting upwardly and passing through suitable apertures in a movable bracket **78** which includes movable bosses **74**. The shafts **77** are threaded at the upper ends to receive retaining nut **79**, for compression springs **81** which serve to urge the movable bosses **74** downwardly with respect to the fixed bosses **73** and thereby engage the pairs of rollers **71**. To provide a limit stop for this engagement suitable pairs of set screws **82** are provided in respective vertical bosses **83** in the upper movable casting **78** and engage suitable stop screws **84** at one end and suitable stop members **86** at the other.

By this means the rollers can be properly spaced to en-

gage firmly a carton blank advanced between the rollers and to propel this carton blank onto the tracks **14** for engagement by the feed elements **13**.

As seen in Figures 1, 2, 3 and 5, the respective upper and lower shafts **72** of each pair of feed rollers **71** are connected together by an intermeshing pair of gears **92**. Also the lowermost shafts **72** adjacent the feed end of the machine are connected by a coupling collar **72***a*. Also shafts **72** in each case are extended to carry a sprocket **96**. The sprockets **96** at the near side of the machine as viewed in Figure 2 are connected by a chain **91**. The sprockets **96** at the opposite side of the machine (Figures 1 and 3) are connected by a chain **97** which also engages an idler sprocket **99** and a drive sprocket **98** on the drive shaft **101**. The shaft **101** is suitably journaled on the framework of the machine and is connected through a suitable chain and sprocket drive with the shaft **11** of the machine. The shaft **101** also serves through a chain sprocket mechanism **103** to drive the eccentrics **63** in a suitable manner. From the above description it will be seen that the various elements of the carton feed mechanism are all driven in synchronism with the conveying means of the carton handling machine.

To summarize the operation of the feed mechanism, the carton hopper composed of the angle shaped uprights **26** and the upright posts **27** and **36** are adjusted appropriately to accommodate the stack of cartons to be handled, and the stack of cartons is placed therein, resting on the inclined plate. When the machine starts to operate the reciprocation of the slide structure **51** and its feed blocks **57** carried by the spring arms **56** engage the lowermost carton **16** and advance this carton through slot **32** to engage the first set of feed rollers **71**. These feed rollers **71** are driven of course in timed relation to the feed chain **12** and its progressors **13** and the carton is projected rapidly by the sets of feed rollers **71** onto the tracks **14** into position between a pair of adjacent progressor elements **13** which then carry the carton along the tracks **14** for subsequent operation.

Figure 8 shows a modified form of the invention wherein a carton erecting finger **13***a* is attached to the chain **12***a* by a compound linkage including chain links **200** and a connecting link **201**, the carton **16** being urged against a stop member **202** by the link **13***a* as it is elevated in going from the turn on the sprocket to the straight stretch of the chain **12***a*. As seen in Figure 8, the end of the erecting finger **13***a* will travel between the feed rollers **71**.

While I have shown and described a preferred embodiment of the invention, it will be apparent that the invention is capable of variation and modification from the form shown, so that the scope thereof should be limited only by the scope of the claims appended hereto.

I claim:

1. In a carton erecting and closing machine, a feed mechanism including a hopper for cartons and reciprocatory means for ejecting the cartons carton-by-carton from the hopper, a pair of spaced-apart frame brackets extending from the discharge end of said feed mechanism, each of said frame brackets having a pair of transverse bosses therein spaced along the length of said frame brackets; similar bosses of said respective frame brackets being aligned, a feed roller in each of said bosses, an elongated movable bracket positioned above each of said frame brackets, each of said movable brackets having a pair of bosses vertically aligned with the bosses of the associated frame bracket, a roller journaled in each of the bosses of said movable brackets and engaging the associated roller mounted in said frame brackets, and spring means urging each of said movable brackets towards the associated frame bracket.

2. In a carton erecting and closing machine as recited in claim 1 in which the space between the remote pairs of rollers in the direction of feed is open, and a feed element forming a part of said erecting and closing mechanism and having a path of travel passing between said remote pairs of rollers.

3. In a feed mechanism for carton blanks, a hopper construction for a stack of cartons comprising a plurality of upright carton confining members including a post for engaging one side of the cartons intermediate ends thereof, a frame structure, means for supporting said post on said frame structure including a supporting bracket extending to either side of the post and a pair of supporting arms secured for pivotal adjustment on said frame structure and having a slotted connection with said bracket, support means for said cartons in said hopper including a slide structure having a carton-supporting surface inclined downwardly in the direction of feed, and means for operating said slide structure.

4. In a carton erecting and closing machine, a feed mechanism including a hopper for cartons and reciprocatory means for ejecting the cartons carton-by-carton from the hopper, respective sets of rollers at the discharge side of said hopper for receiving the carton therefrom, said sets of rollers being spaced apart along the direction of travel of the carton and each set of rollers comprising opposite pairs of rollers, the space between the remote pairs of rollers in the direction of the feed being open, and said erecting and closing mechanism including a feed element having a path of travel passing between said remote pairs of rollers.

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