April 18, 1950 J. KIEVIT 2,504,698

MACHINE FOR MAKING ROLL DISPENSING CONTAINERS

Filed Sept. 28, 1948 6 Sheets-Sheet 1

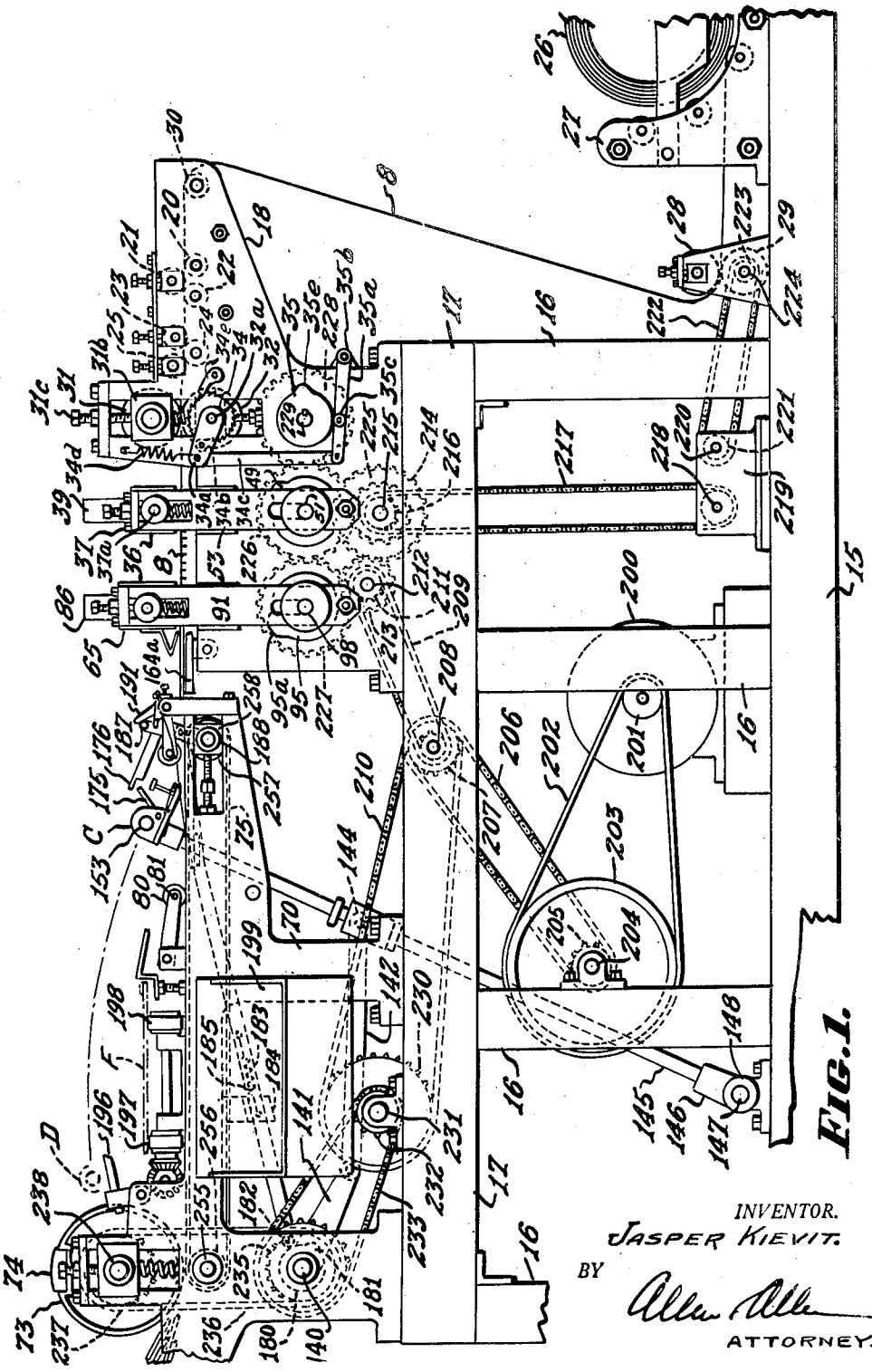


FIG. 1.

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MACHINE FOR MAKING ROLL DISPENSING CONTAINERS

Filed Sept. 28, 1948 6 Sheets-Sheet 2

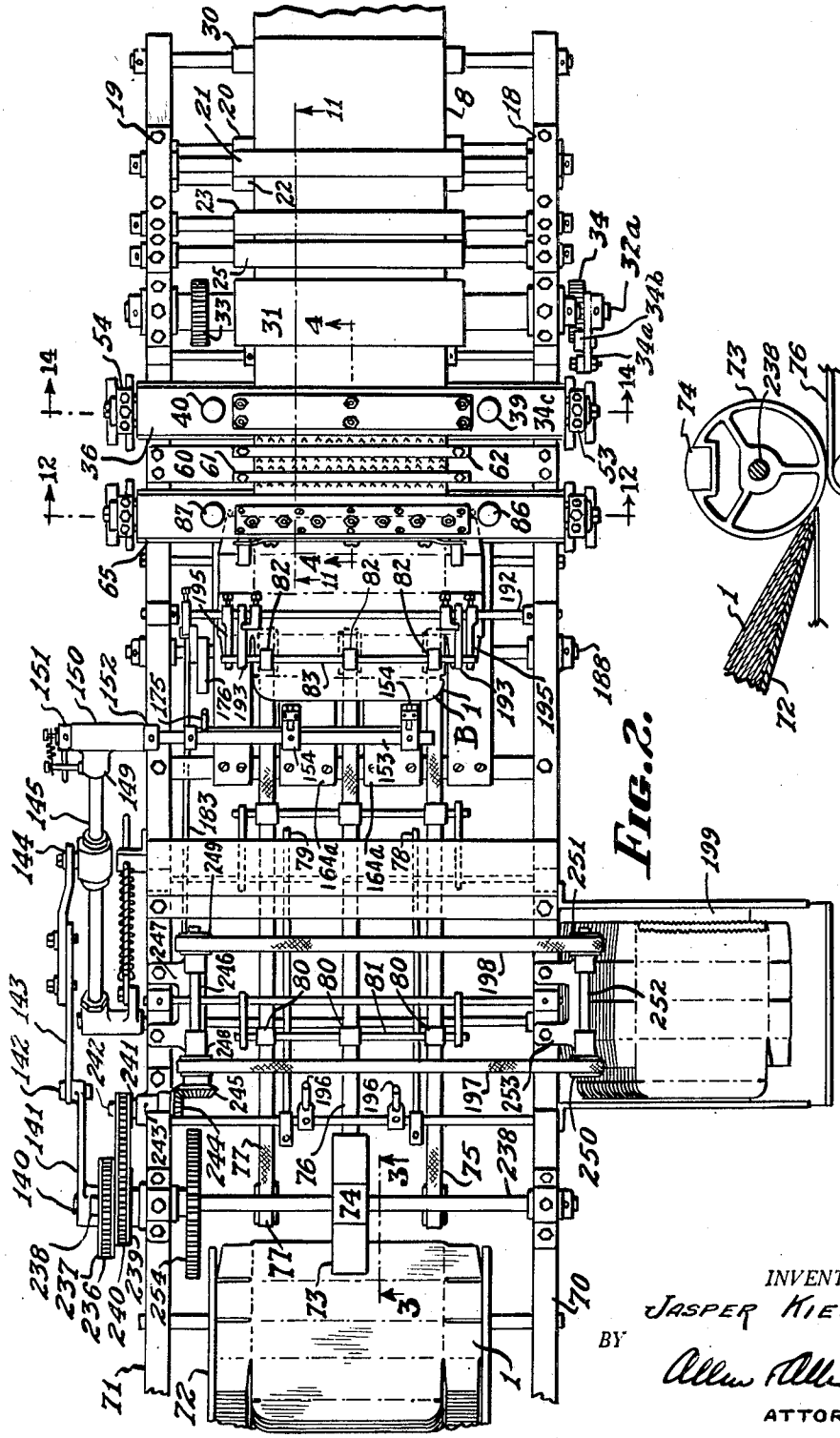


Fig. 2.

Fig. 3.

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April 18, 1950 J. KIEVIT 2,504,698

MACHINE FOR MAKING ROLL DISPENSING CONTAINERS

Filed Sept. 28, 1948 6 Sheets-Sheet 3

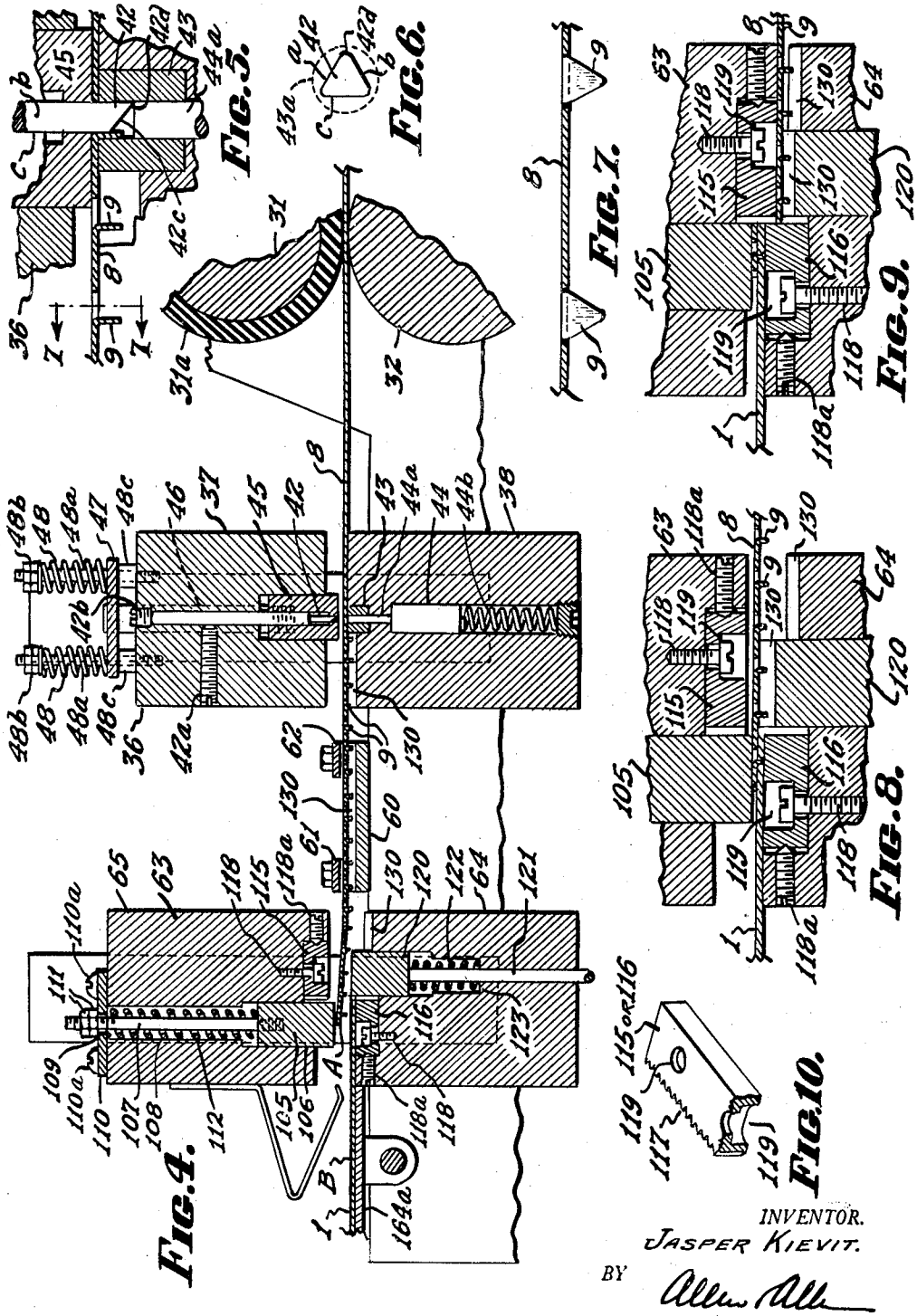


FIG. 4.

FIG. 5.

FIG. 6.

FIG. 7.

FIG. 8.

FIG. 9.

FIG. 10.

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April 18, 1950 J. KIEVIT 2,504,698

MACHINE FOR MAKING ROLL DISPENSING CONTAINERS

Filed Sept. 28, 1948 6 Sheets-Sheet 4

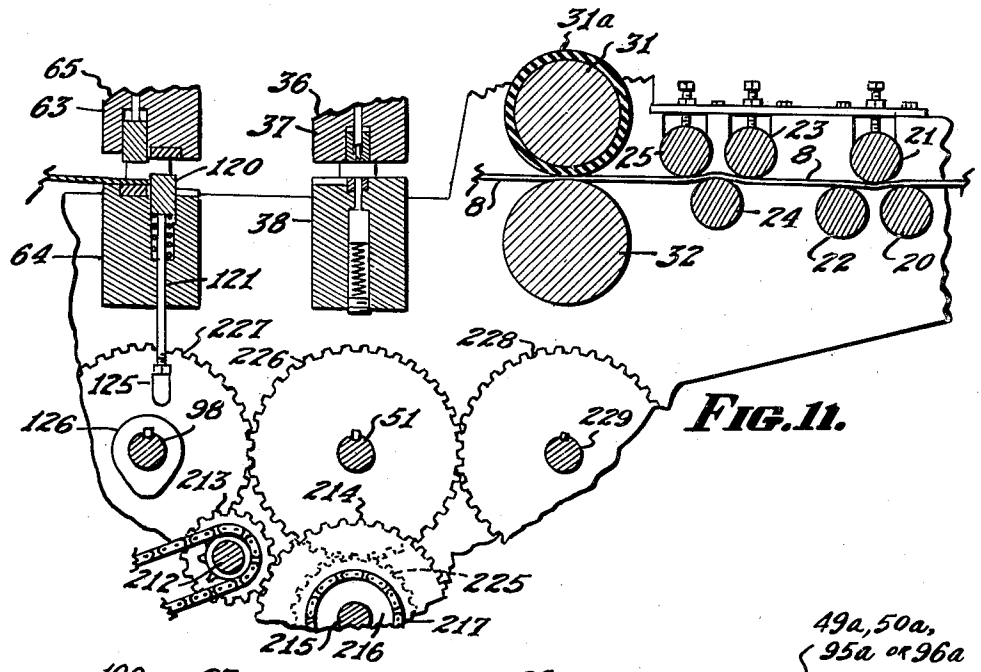


FIG. 11.

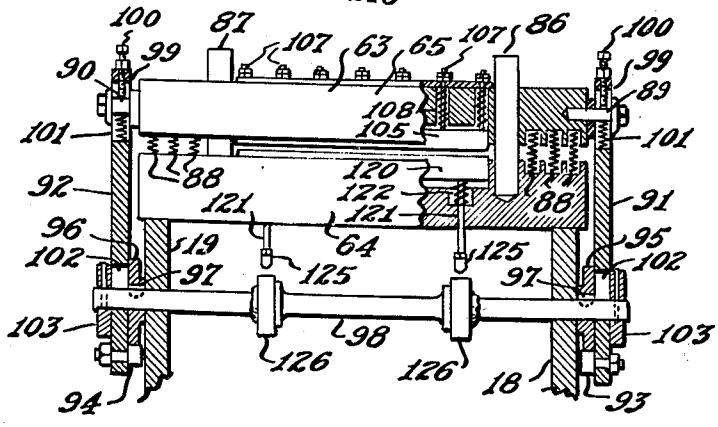


FIG. 12.

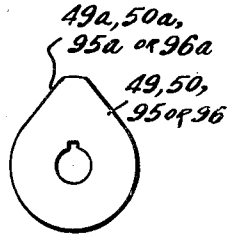


FIG. 13.

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April 18, 1950 J. KIEVIT 2,504,698

MACHINE FOR MAKING ROLL DISPENSING CONTAINERS

Filed Sept. 28, 1948 6 Sheets-Sheet 5

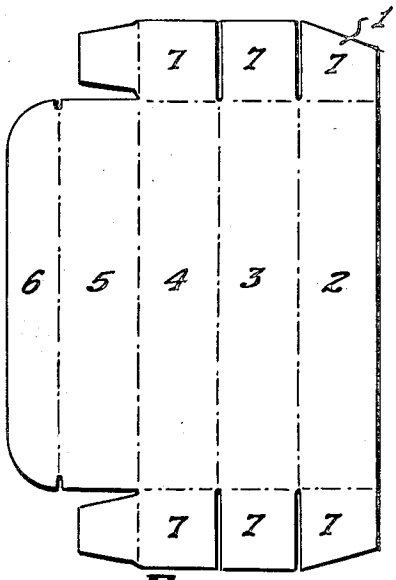


FIG. 15.

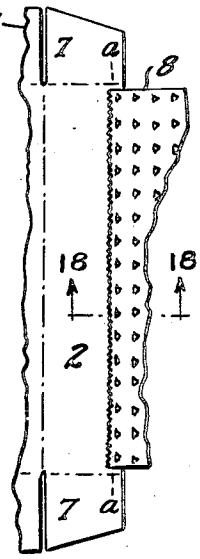


FIG. 16.

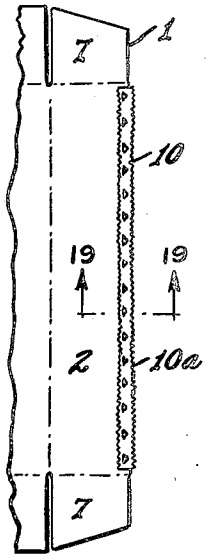


FIG. 17.

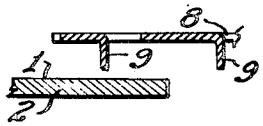


FIG. 18.



FIG. 19.

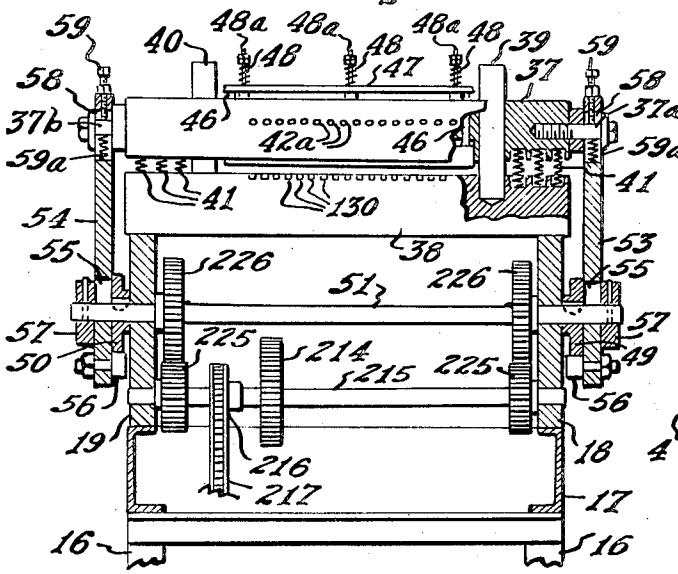


FIG. 14.

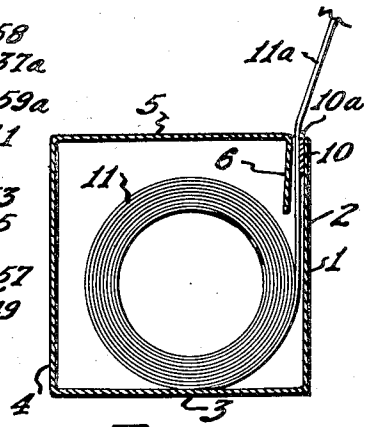


FIG. 20.

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April 18, 1950 J. KIEVIT 2,504,698

MACHINE FOR MAKING ROLL DISPENSING CONTAINERS

Filed Sept. 28, 1948 6 Sheets-Sheet 6

FIG. 22.

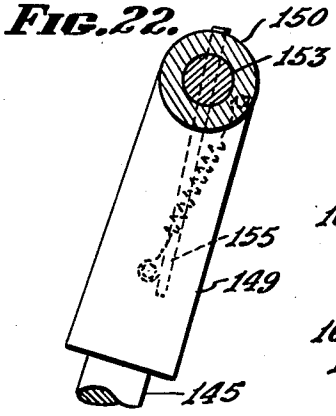


FIG. 21.

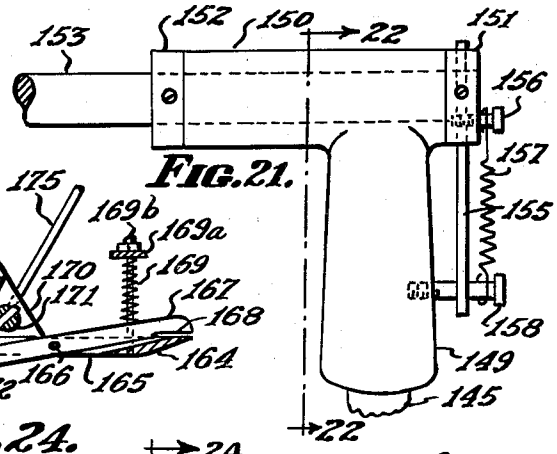


FIG. 24.

FIG. 23.

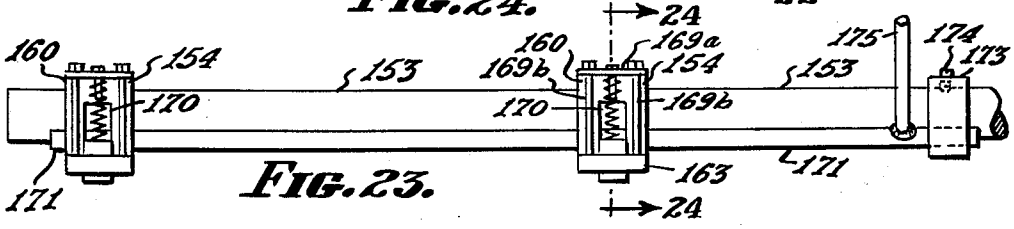
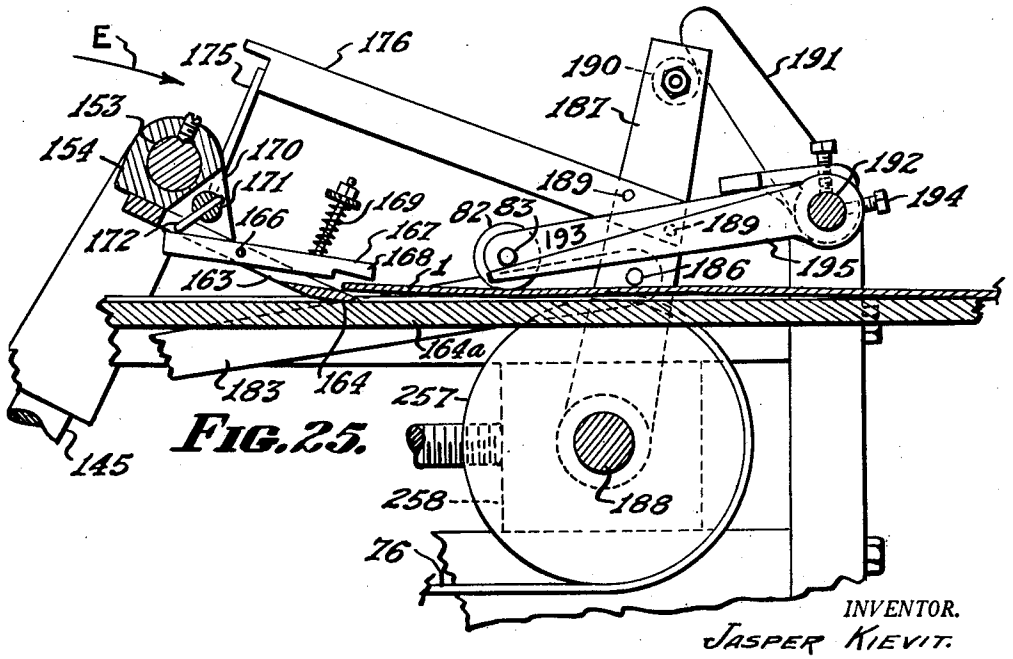


FIG. 25.



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Patented Apr. 18, 1950 2,504,698

UNITED STATES PATENT OFFICE

2,504,698

MACHINE FOR MAKING ROLL DISPENSING CONTAINERS

Jasper Kievit, Middletown, Ohio, assignor to The Crystal Waxing Company, Middletown, Ohio, a corporation of Ohio

Application September 28, 1948, Serial No. 51,620

7 Claims. (Cl. 1—2)

1

My present invention relates to machines and methods employed in the manufacture of paperboard boxes or containers of the type wherein a roll of paper or the like is contained. In this type of box it is conventional practice to arrange the roll so that as the web is withdrawn from the roll (retained within the box) the web passes outward through a slot or passageway existing between the front wall panel of the box and the closure flap. When the user has withdrawn a strip of paper of desired length, the withdrawn portion is torn off, using the upper edge of the front wall to facilitate the tearing off of the withdrawn portion. To facilitate this operation the upper edge of the front wall panel is often reinforced and provided with a reinforced tear off knife. This is usually a thin, narrow stiffening strip often made of metal, plastic or the like, which is affixed to the carton blank while the blank is in knock down flat condition.

So far as I am advised, these metal or reinforcing strips have heretofore been provided in coils of tape-like material which are cut off to length prior to attachment to the box wall, and the methods of attaching these tear off knives to the blanks has entailed considerably greater expense in proportion to the cost of the finished container than my new method involves, wherein the fabrication of the tear-off knives and their attachment to the box walls is accomplished in a substantially unitary sequence of operations.

More specifically therefore, my present invention relates to an improved method and machine for fabricating and attaching tear-off knives to box blanks.

An object of my invention is to provide an improved method for forming and affixing tear-off strips of the type herein described, to box blanks which are subsequently set up into containers of the roll dispensing type.

It is an object of my invention to provide an efficient machine for rapidly fabricating tear-off knives and attaching them to the blanks for roll dispensing containers, the sequence of operations being such that tear-off strips are fabricated from a roll of metal of a width equivalent to the length of the tear-off knives. As the web is fed along it is first stamped to provide clinching tongues, when the fabricated strips are clinched to the container wall and finally the strip is cut off from the advancing end of the web of metal. I refer to the pending operation which prepares the "tear-off" knife for application to the carton wall as a fabricating step.

Thus instead of feeding a metal tape parallel

2

with the edge of the front wall of the container and attaching it to the box wall, it is my object to feed a web of thin metal along and form attaching tongues as it is fed, then to clinch these tongues to the box wall and finally to cut off the strip laterally of the metal web to form the individual tear-off knife for each carton. Since no problem of registering each unitary tear-off knife with a box wall edge is involved, much greater speeds of operation can be effected. The tear-off knife, it will be understood, has a cutting edge, preferably serrated, against which the withdrawn portion of the web is pulled with enough tension to cause severance of the withdrawn portion of the web. Other words may be used, such as "cutting edge" to define the stiffening strip against the edge of which the web is severed.

The foregoing objects and other advantages and improvements will be apparent in the specification and description which follow, reference now being made to the drawings wherein:

Figure 1 is a side elevational view of a preferred type of machine with parts broken away and certain other parts in section.

Figure 2 is a plan view of the machine.

Figure 3 is a fragmentary sectional view taken along the line 3—3 of Figure 2.

Figure 4 is an enlarged fragmentary sectional view taken along the line 4—4 of Figure 2.

Figure 5 is a further enlarged fragmentary detail explanatory of the punching or forming operation.

Figure 6 is an end elevation of a punch or forming die as employed in my machine.

Figure 7 is a sectional view taken along the line 7—7 of Figure 5 showing the downwardly bent fastening prongs or tongues in detail.

Figure 8 is an enlarged fragmentary detail view illustrating the clinching operation.

Figure 9 is a similar view illustrating the shearing operation.

Figure 10 is a fragmentary perspective of a shearing element.

Figure 11 is a fragmentary enlarged sectional view taken along the line 11—11 of Figure 2.

Figure 12 is a sectional view taken along the line 12—12 of Figure 2, but with parts broken away and other parts in section to illustrate certain details of the clinching and shearing mechanism.

Figure 13 is a side view of a cam member.

Figure 14 is a sectional view taken along the line 14—14 of Figure 2 with parts broken away and other parts in section showing certain details of the punching and forming mechanism.

Figures 15, 16, 17, 18 and 19 illustrate various steps in attaching the "tear-off" strip or metal edge to the carton blanks.

Figure 20 is a sectional view illustrating a container formed in accordance with my invention.

Figure 21 is a fragmentary elevational view of certain detailed construction of the machine.

Figure 22 is a sectional view taken on line 22—22 thereof.

Figure 23 is an elevational view of the gripper bar assembly employed to remove the finished cartons from the machine.

Figure 24 is a section taken on line 24—24 thereof.

Figure 25 is a sectional view taken on various planes as best suited to illustrate the function of the gripper members.

Briefly my machine embodies means for feeding a metal or plastic web from one end of the machine and a carton blank from the other end, the advancing end of the web and the blank being moved toward each other for purpose of uniting them at a certain work station. During operation of the machine a carton blank is conveyed to position against an abutment whereby further movement of the blank is arrested and it awaits further operation of the machine. The web is intermittently advanced in measured increments by a pair of measuring feed rolls. Operating in timed relation with each forward movement of the web a punching and forming mechanism functions as the initial fabricating step wherein a series of transverse rows of small downwardly depending prongs or fastening lugs are punched out. The forward edge of the web, with a single transverse row of the prongs or clinching teeth thus formed, is guided into position over the awaiting carton blank, whereafter a clinching device operates to secure the advancing portion of the web, to the carton blank. Immediately thereafter a shearing device operates to sever the attached portion of the metal strip from the web. The carton blank, thus in its finished condition with the metal tear-off knife cut off from the web and attached thereto, is next removed from the machine, as will later be described in detail, and the cycle of operations is completed.

Some of the operations just described and others to be later disclosed, will be more clearly understood by reference to Figures 15 through 20. As shown in these figures the carton blank 1 comprises main body panels 2, 3, 4 and 5, the panel 2 being the ultimate front wall of the erected dispensing container as shown in Figure 20, and the panel 5 forming the top cover panel to which is articulated the closure flap 6. End wall panels, generally indicated at 7, will, of course, be provided and it will readily be understood that these end panels may be arranged in any of various manners to form suitable end closures.

As seen in Figure 15, the carton blank 1 may be assumed to be positioned at rest and the metal web 8 is about to be advanced and guided in the direction of the arrow X, the web being slightly elevated above the blank. It will be observed that the web 8 is formed with transverse rows, *a* to *a*, *b* to *b*, or *c* to *c*, of downwardly bent prongs or fastening lugs 9, shown in greatly enlarged section in Figure 18. Referring now to Figures 16 and 18, the web 8 has been advanced to a position above the carton with the first transverse row, *a* to *a*, of the prongs 9 in suitable position to be forced through the carton blank and clinched thereto. Just as this clinching operation is completed the attached web and carton blank will appear as in Figure 16 with the row, *a* to *a*, of fastening prongs engaging the blank.

The next operation entails severing that portion of the web which has just been attached as the individual tear-off knife of the carton blank. The result of this operation is illustrated in Figures 17 and 19 from which figures it will now be apparent that the finished carton blank 1 is provided with a metal "tear-off" knife or cutting edge 10, this strip being securely attached to the carton blank by virtue of the prongs 9 which as seen in Figure 19 extend through the boxboard and are clinched or bent over as shown at 9*a*.

It may be noted that the individual "tear-off" knife 10 is formed with a serrated edge 10*a* which improves the cutting action in making a neat lateral. The transversely extending serrated edge is produced by a similar configuration of the shearing elements later to be described.

Figure 20 illustrates the erected container with a roll of paper or the like 11 therein. It may be pointed out that the paper strip 11*a* is withdrawn from the box through the passageway existing between the front wall panel 2 and the closure flap 6 and that the withdrawn portion 11*a* of the strip may be readily severed from the roll 11 by pulling the strip downward against the serrated edge 10*a* of the "cut-off" knife 10.

Referring now to Figures 1 and 2, my machine comprises a suitable base 15 with upright members 16 supporting an elevated framework 17. Mounted on this framework 17 is a pair of suitable castings 18 and 19 which serve to mount a series of straightening rolls 20, 21, 22, 23, 24 and 25, which rolls serve to remove any excess curvature from the incoming metal strip 8. The metal or plastic web will preferably be supplied in a roll or coil 26 which may be placed in a suitable decoiling device such as that shown at 27, the free end of the web being gradually withdrawn from the coil by a pair of slowly driven feed rolls 28 and 29. As shown the web then passes upward and over an idler roll 30 whereafter it is drawn through the straightening rolls by action of the measuring rolls 31 and 32.

The roll 31 is provided with a rubber sleeve 31*a* (Fig. 11), the rollers 31 and 32 being geared together as indicated at 33 (Fig. 2). The roll 31 is journaled in sildable bearing blocks 31*b* and pressure adjusting screws 31*c* are provided. Fixed on the shaft 32*a* of the lower roll 32 is a ratchet wheel 34. A lever arm 34*a*, mounted for operation upon the shaft 32*a*, carries a pawl 34*b* and at its outer end is pivotally connected to a link 34*c*. A tension spring 34*d* urges the parts to the position shown.

At its lower end the link 34*c* is pivotally connected to a lever arm 35*a* which is itself pivotally mounted as at 35*b*, on the frame and carries a roller or cam follower 35*c*. A cam 35 having a rise or hump 35*e* is fixed on shaft 229, later to be described, and engages the cam roller 35*c* to produce an oscillating movement of the lever 35*a* which lever, acting through link 34*c*, produces a similar oscillation movement of the arm 34*a* resulting in the pawl 34*b* turning the ratchet wheel 34, and consequently the rolls 32 and 31 to feed the web 8 forward. The lineal movement of the web will, of course, be determined by the rise of the cam. A pawl 34*e* engages the ratchet wheel to prevent possible backlash.

By means of the arrangement just described, the web 8 is advanced step by step, from right to left as seen in Figures 1 and 2, in measured

increments and in timed relation with other movements of the machine. The web, thus being advanced, next passes into the punching and forming device generally indicated at 36.

Referring now to Figures 4, 5, and 14, which show enlarged detail of the mechanism with which this initial fabricating step is accomplished, the web passes between upper and lower coacting members 37 and 38. The upper member 37 is slidably mounted on studs 39 and 40 (see Fig. 14), and is urged to the position shown by a series of compression springs 41. This upper member 37 carries a series of punches or forming dies 42 arranged transversely to the strip. The lower member 38 is fixedly mounted in the frame members 18 and 19, previously mentioned, and has a series of female die elements 43 which coact with the punches 40 to produce the downwardly bent prongs or clinching teeth 9. Figure 5 shows the position assumed by the parts during a forming operation and it may be pointed out that a resiliently mounted plunger or stripper device 44 having a reduced portion 44*a* and urged to the position shown in Figure 4 by a compression spring 44*b*, is provided in conjunction with each of the forming dies. This plunger is depressed by the forming operation whereafter, in returning to its normal position, it serves to lift or strip the prongs 9 from the female die element 43 permitting the web 8 to be advanced from the position shown. There is also a stripping means for the punches 42. This consists of a bar 45 resiliently mounted in the member 37 and formed as shown to surround the lower ends of the punches 42. The stripper bar 45 is fixed to rods 46 slidably mounted in the member 37, the rods 46 being fixed at their upper ends to a plate 47. The plate 47, and consequently the stripper bar 45, is urged downwardly by compression springs 48 which surround studs 48*a*, the springs bearing against the plate 47 and lock nuts 48*b*. Downward movement of the stripper assembly is limited by the short sleeves 48*c* mounted on the studs 48*a* as shown.

The required movement of the upper member 37 is produced by action of cams 49 and 50, having humps or rises 49*a* and 50*a* respectively, which cams are fixed at either end of a shaft 51 journaled in the frame members 18 and 19. The member 37 is provided with pins or studs 37*a* and 37*b* respectively engaged by slidably mounted links 53 and 54. At their lower ends the links 53 and 54 are provided with cam followers or rollers 56 which coact with the cams to produce the required downward movement of the upper forming member 37. As shown, the links 53 and 54 are slotted near their lower ends as at 55, the shaft 51 extending through these slots and having affixed collars 57 to retain the links 53 and 54 in operative relation. At their upper ends the links 53 and 54 are provided with slots 58 through which the studs 37*a* and 37*b* extend. Adjusting screws 59 bear against the studs to permit adjustment and small compression springs 59*a* act as take-up means preventing undue loss of motion.

The punches or forming members 42 are removably and adjustably mounted in the member 37, by means of set screws 42*a* and adjusting screws 42*b* arranged as seen in Figure 4.

Referring now to Figures 5 and 6, the cutting and forming ends of the punches 42 are triangular in cross section, the sides of the triangle being indicated at *a*, *b*, and *c*. The end of each punch is ground to an angle indicated at 42*c*

producing a high point or initial piercing edge 42*d*. The inside diameter of the female element 43 is indicated at 43*a* and it will be observed that the arrangement is such that as the punch 42 strikes the metal strip the high point 42*d* will first pierce the metal. Continued downward movement of the punch will then cause the sides or edges *a* and *b* to act as cutting means forming a V-shaped cut, while the side *c* acts as a bending agent to form the cut portion downwardly and produce the fastening lugs or clinching teeth 9 as seen in Figure 7.

As the web 8 with its transverse rows of downwardly bent fastening prongs leaves the forming mechanism it passes between a lower guide plate 60 and upper guide bars 61 and 62 which direct the web into the clinching and shearing mechanism generally indicated at 65 and wherein the strip occupies the position A as indicated in Figure 4. As here shown the web is positioned between upper and lower members 63 and 64 respectively of the clinching and shearing mechanism awaiting operation thereof to clinch the strip to a wall of an awaiting carton blank 1, which blank has been conveyed into position indicated at B by means and mechanism next to be described.

Referring again to Figures 1 and 2, there is mounted at the left end of the machine a pair of castings 70 and 71 which support a conventional feed board 72 and feed wheel 73. As well known in the art the feed wheel 73 has a friction pad 74 which serves to withdraw the carton blanks, one at a time, from the feed board and deposit the blank thus withdrawn on a conveyor here shown as comprising belts 75, 76 and 77, which are driven by suitable means later to be described. Suitable hold down bars 78 and 79 are of course, provided and rollers 80 mounted on a shaft 81 bear lightly against the blank as it is carried forward by the belts. The blank is carried forward until it strikes an abutment, later to be described, within the clinching and shearing mechanism, which abutment halts movement of the blank and it comes to rest in the position indicated at B in Figure 2. It will here be noted that the blank is retained in the position shown by the rollers 82 mounted on shaft 83, which rollers bear lightly against the blank pressing it against the conveyor belts which slip beneath the blank and frictionally urge it to position. In Figure 4 the relative positions of the web 8 and the carton 1, just prior to the clinching operation are indicated at A and B respectively.

Referring now to Figure 12, the upper member 63 of the clinching and shearing device is slidably mounted on studs 86 and 87, which studs are fixedly mounted in the lower member 64. The member 64 is in turn rigidly mounted between the frame members 18 and 19. Compression springs, generally indicated at 88 and arranged as shown, serve to urge the member 63 upward with respect to member 64. The member 63 has studs 89 and 90 engaged by links 91 and 92 which links are respectively provided, near their lower ends with cam rollers 93 and 94. Cams 95 and 96 having humps or rises 95*a* and 96*a* respectively, are keyed as at 97 to a shaft 98 suitably journaled in the frame members 18 and 19. For purpose of adjustment, the links 91 and 92 are slotted as at 99 and are provided with adjusting screws 100 which bear against the studs 89 and 90. Springs 101 serve as take-up devices and maintain the relative position of the links as shown. The lower ends of the links are slotted as at 102,

the shaft 98 extending through these slots and having affixed collars 103 which retain the links in operative relation.

Referring again to Figure 4 the upper member 63 is provided with a resiliently mounted pressure bar 105 slidably mounted in a channel 106 of member 63. The bar 105 has a series of studs 107 which extend through enlarged holes 108 of member 63 and also through perforations 109 of a plate 110 fixed by screws 110a to the member 63. At their upper ends the studs 107 are threaded to receive lock nuts 111. Each of the studs 107 is surrounded by a compression spring 112 which bears against the plate 110 and the pressure bar 105 urging the bar 105 to the position shown. Also mounted in the member 63 is a shearing element or die 115 which coacts with a similar shearing element 116 mounted in the lower member 64. The shearing elements each have a serrated cutting edge 117 and are retained in operative relation by screws 118, the heads of which engage with elongated slots or holes 119 which permit adjustment of the shearing members by means of adjusting screws 118a.

With the metal strip now positioned as at A and the carton blank positioned as at B, the member 63 is pulled downwardly toward the member 64 by action of the cams 95 and 96 previously described. This downward movement of member 63 first causes the pressure bar 105 to contact the advanced end of the web at A and drive the first transverse row of clinching teeth 9 through the carton blank. The prongs 9, being slightly longer than the thickness of the boxboard, will be bent over or clinched as at 9a in Figure 19. Just as this clinching operation is completed, the relative position of parts will be as shown in Figure 8, where it will be observed that the web 8 is now affixed to the carton blank 1.

With the clinching operation thus completed the member 63 moves farther downward to the position of Figure 9 during which movement the shearing elements 115 and 116 sever the advanced portion of the web 8 from that portion which was clinched to the carton blank 1 and the blank with its metal edge attached appears as in Figure 17.

During the shearing operation as just described, the metal strip 8 is gripped between the upper knife 115 and a spring mounted pressure bar 120 retractably mounted in the lower member 64. The bar 120 is provided with a pair of depending studs 121 each surrounded by a compression spring 122 which bears against a shoulder 123 of member 64 to urge the bar 120 to the position shown in Figure 4. As seen in Figures 10 and 11, the studs 121 extends down through the member 64 and are provided at their lower ends with cam followers 125 engaged by cams 126 fixed on the shaft 98. The cams 126 assure that after each shearing operation the bar 120 will be lifted to the position of Figure 4 where it will be observed that the bar 120 serves to guide or lift the web 8 to a position slightly above the carton blank 1, and also that the bar 120 serves as an abutment for positioning the carton blank. To provide clearance for the downwardly bent fastening prongs 9 the members 38, 60, 64 and 120 are provided with suitable grooves generally indicated at 130.

Referring again to Figures 1 and 2, the completed carton blank with its metal tear-off edge attached remains in the position indicated at B awaiting removal from the machine as will next be described. For this purpose a shaft 140 journaled in the frame members 70 and 71 has affixed a crank arm 141 having pivoted connection as at 142 to a link 143, which link is pivotally attached as at 144 to a member 145. The member 145 is itself provided with a pivoted bearing arrangement at its lower end, the member 145 being affixed by means of a casting 146 to a transverse shaft 147 journaled in a suitable bearing 148.

This pivoted arrangement of the member 145 permits the member to be oscillated by action of the crank arm 141 and the link 142. The approximate limits of the oscillating movement thus produced at the upper end of member 145 are indicated in Figure 1 at C and D. Fixed to the upper end of the oscillating member 145 is a casting 149 having a transversely disposed bearing portion 150. Journaled in this bearing 150 and retained therein by collars 151 and 152 is a shaft 153 which carries a pair of fingers or gripper devices 154.

Referring now to Figures 21 and 22, the collar 151 is fixed to the shaft 153 by means of a long pin 155. A stud 156 mounted in the collar is engaged by a tension spring 157, the other end of which spring engages a stud 158 mounted in the casting 149. By the arrangement shown, the pin 155 normally abuts the stud 158 so that no rotational movement of the shaft 153 occurs. However, the arrangement permits a slight rocking of the shaft 153 which rocking is advantageous at the position where the fingers or pick-up members engage the carton blank to remove it from the machine as will later be understood.

The fingers or pick-up devices each comprise a member 160 fixed to the shaft 153 by a set screw 161. Fixed to the member 160 by screws 162 is a plate 163 having a beveled edge 164 and a central slot or cut-out portion 165. A pin 166 mounted in the plate 163 serves as a pivot for a finger or clamp member 167, which is mounted within the slot 165. One end of the finger 167 is formed as at 168 and a light compression spring 169 urges this end of the finger to a closed position against the plate 163, thus forming a gripping means for engaging the carton blank. At its upper end the spring 169 abuts against a plate 169a mounted by means of studs 169b secured in the plate 163.

As best seen in Figure 23, a shaft 171 extends through both of the gripping devices 154, and also through a collar 173 fixed by screw 174 to the shaft 153, the shaft 171 being rotatably mounted in these members, and having an operating lever 175. The members 160 each have a slotted or cut-out portion 170 and within these slotted portions the shaft 171 is provided with short pins 172, which are arranged to bear against the finger elements 167. A rocking movement of the shaft 171 will thus cause the pins 172 to rock the fingers about their pivot pins 166 causing the ends 168 of the fingers to be rotated slightly counterclockwise against compression of the springs 169, thus effecting an open position of the gripping elements. This position of the parts is shown in Figure 25 where the oscillating member 145 with its transverse shaft 153 carrying the gripper elements 154 is approaching its extreme limit of oscillating movement in the direction indicated by the arrow E and reversal of travel is about to occur. As the parts arrive at this position the operating lever 175 is contacted by an abutment member 176 causing the shaft 171 to be rotated slightly counterclockwise and bringing the gripper elements to an open position suitable for engaging the carton. Also as the gripper assembly approaches the position E,

the beveled edge 164, of the plates 163, strikes against platform members or plates 164a mounted in the frame. This results in slight rotational movement of the shaft 153 as the shaft and its associated elements move into position to engage the carton 1.

Referring briefly to Figure 1, the shaft 140 mounts a cam 180 having a rise or hump 181. A roller or cam follower 182 is mounted in a bar 183 slidably mounted in a bracket 184 and urged to position against the cam by a tension spring 185. The arrangement of the cam 180 is such that just as the gripper bar 153 commences its reversal of movement the bar 183 is shifted against tension of the spring 185. Referring again to Figure 25, the other end of the bar 183 is pivotally connected as at 186 to a lever arm 187 pivotally mounted on the shaft 188. The abutment member 176 previously mentioned is fixed by screws 189 to the lever 187. As thus described movement of the bar 183 will cause the lever 187 to be shifted in clockwise rotation carrying with it the abutment member 176 and removing the abutment from the operating lever 175, permitting the springs 169 to close the fingers 167 against the carton blank. The lever 187 also carries a roller 190 which serves to shift or rock a lever 191 fixed on shaft 192. The pressure rollers 82, as previously mentioned are mounted on the shaft 83. The shaft 83 is itself mounted in supporting arms 193 which arms are freely pivoted on the shaft 192. Fixed to the shaft 192 by screws 194 are lever arms 195 which engage beneath the shaft 83. It will now be apparent that the shifting of lever 187 will also rock the lever 191, shaft 192 and lever 195, which lever engaging the shaft 83 will lift the pressure rollers 82 away from the carton blank. This permits free withdrawal of the blank by the gripper mechanism which carries the blank to the left as seen in Figure 1 where, as the gripper mechanism approaches the position indicated at D a pair of abutments 196 are arranged to abut the leading edge of the carton blank. The blank, striking these abutments, is thus withdrawn or stripped from the gripper mechanism which continues its movement sufficiently to effect complete removal and the carton blank drops by gravity to the position indicated at F upon a cross conveyor comprising belts 197 and 198 which carry the carton from the machine to a suitable receiving device such as the receiver indicated at 199. With the removal of each carton as just described, a new carton blank is withdrawn from the hopper and conveyed into position, the operation of the machine being continuous.

It will readily be understood that the various mechanisms embodied within my machine may be suitably driven and operated in timed relation by various arrangements of driving mechanism and that I am not to be limited to the arrangement thereof as shown in the drawings and next to be described.

Referring to Figure 1, a motor 200 has a pulley 201 driving a belt 202 running over a larger pulley 203, which is mounted on a shaft 204. The shaft 204 is journaled in suitable bearings on the frame and has a sprocket 205 driving a chain 206 which in turn drives a sprocket 207 and shaft 208. Other sprockets fixed on the shaft 208 drive a chain 209 and a chain 210.

The chain 209 drives a sprocket 211 fixed on a shaft 212 journaled in the frame members 18 and 19. A gear 213 fixed on the shaft 212 drives a larger gear 214 fixed on shaft 215 which is also journaled in the side frames 18 and 19. Fixed on the shaft 215 a sprocket 216 drives a chain 217, which chain 217 drives a sprocket 218 of a reduction unit 219, the output or reduced speed shaft 220 of which has a sprocket 221 driving a chain 222 which drives a sprocket 223 fixed on the shaft 224 of the feed roll 29.

Also fixed on the shaft 215 a gear 225 drives gear 226 fixed on the shaft 51 previously described. The gear 226 drives a gear 227 fixed on the shaft 98, also previously described. Also driven by the gear 226 is a gear 228 mounted on a shaft 229 which shaft is journaled in the side frames 18 and 19 and has fixedly mounted the cam 35 previously described.

The gears 225, 226 and 227 mounted respectively on shafts 215, 51 and 98 may, for purpose of rigidity and smooth action of the machine, be duplicated near opposite ends of their respective shafts. This will be clear from inspection of Figure 14 which shows duplicate gears 225 and 226 near the frame members 18 and 19.

The chain 210 drives a sprocket 230 fixed on a shaft 231 journaled in bearing blocks mounted on the frame. Fixed on shaft 231 is a smaller sprocket 232 driving a chain 233 which chain drives sprocket 234 fixed on shaft 140 previously mentioned. The shaft 140 has a sprocket 235 which drives a chain 236 running over a sprocket 237 fixed on shaft 238 which shaft 238 mounts the feed wheel 73 previously described.

Referring briefly to Figure 2, the shaft 238 has a sprocket 239 driving a chain 240 which runs over a sprocket 241 fixed on a short shaft 242. The shaft 242 is journaled in a suitable bearing bracket 243 and has affixed a miter gear 244 driving a similar gear 245 fixed on a shaft 246. The shaft 246 is mounted in a suitable bearing bracket 247 and has pulleys 248 and 249 which respectively drive the cross conveyor belts 197 and 198 previously mentioned. At their other ends the belts 197 and 198 return over idler pulleys 250 and 251 mounted on a shaft 252 journaled in a suitable bearing bracket 253. A gear 254 fixed on the shaft 238 drives a gear (not shown) on shaft 255 (Figure 1), the shaft 255 being journaled in the frames 70 and 71 and having affixed pulleys 256 which drive the conveyor belts 75, 76 and 77 previously mentioned, these belts returning over pulleys 257 mounted on the shaft 138 which shaft is journaled in adjustable bearing blocks such as indicated at 258.

It will thus be observed that the method which I employ, and which is facilitated by the use of the machine illustrated, permits the assembly of dispensing cartons with tear-off knives by first moving a web of suitable reinforcing material (such as sheet metal or plastic), first fabricating that portion which is to form the "tear-off" knife by a stamping operation; second clinching the "tear-off" knife or strip to the wall of the carton before the tear-off knife is severed from the web; thirdly severing the "cut-off" knife from the web from which it was fabricated, and finally feeding the carton blank forward for assembly as a dispensing carton. It should be observed that the cutting off of the web with a serrate toothed die leaves a serrate edge for the next succeeding "cut-off" knife, and while this serves no useful function it has no disadvantages and a double cutting, one to provide a serrate edge and the other to provide a smooth leading edge is made unnecessary. Further the full width of the doubly serrated edged knife is used without waste of material.

Having thus described by invention, what I claim as new and desired to secure by Letters Patent is:

1. In combination with mechanism for intermittently feeding, to a position of temporary stoppage, the blanks for roll dispensing containers, mechanism for intermittently advancing a web of stiffening material to said position, mechanism actuable at a stage before said position is reached for stamping a transverse line of attaching teeth in the advancing web, mechanism actuable at said position in a succeeding advance of the web for crimping said attaching teeth to a wall of said container, and mechanism for cutting off the web leaving a strip permanently attached to said container wall.

2. In combination with mechanism for intermittently feeding, to a position of temporary stoppage, the blanks for roll dispensing containers, mechanism for intermittently advancing a web of stiffening material to said position, mechanism actuable at a stage before said position is reached for stamping a transverse line of attaching teeth in the advancing web, mechanism actuable at said position in a succeeding advance of the web for crimping said attaching teeth to a wall of said container, and mechanism for cutting off the web leaving a strip permanently attached to said container wall, said last noted mechanism comprising intermeshing serrated elements.

3. In a machine for applying a reinforcing strip to a wall of a web dispensing container, means for advancing step by step a web of reinforcing strip material, means for fabricating clinching elements in the leading edge of the web, means for clinching said elements and the container wall, and means for cutting off the web leaving a reinforcing strip secured to the wall of the blank.

4. In a machine for applying a reinforcing strip to a wall of a web dispensing container, means for advancing step by step a web of reinforcing strip material, means for fabricating clinching elements in the leading edge of the web, means for clinching said elements and the container wall, and means for cutting off the web leaving a reinforcing strip secured to the wall of the blank, said last mentioned means comprising serrate faced die elements.

5. In combination in a machine for attaching reinforcing strips to a wall of a web dispensing container, means for intermittently advancing a web of reinforcing material, having a width substantially equivalent to the length of the container wall, to a position engaging the container wall, and means for punching attaching tongues in the advancing edge of the web prior to its arrival to the position where it engages the container wall.

6. In combination in a machine for attaching reinforcing strips to a wall of a web dispensing container, means for intermittently advancing a web of reinforcing material, having a width substantially equivalent to the length of the container wall, to a position engaging the container wall, and means for punching attaching tongues in the advancing edge of the web prior to its arrival to the position where it engages the container wall, and means for clinching the attaching tongues to the container wall at the instant of arrival at the position of wall engagement.

7. In combination in a machine for attaching reinforcing strips to a wall of a web dispensing container, means for intermittently advancing a web of reinforcing material, having a width substantially equivalent to the length of the container wall, to a position engaging the container wall, and means for punching attaching tongues in the advancing edge of the web prior to its arrival to the position where it engages the container wall, and means for clenching the attaching tongues to the container wall and permanently severing the clinched portion of the web at the instant of arrival at the position of wall engagement.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,843,429	Marcalus	Feb. 2, 1932