July 1, 1952 R. K. POTTLE 2,601,785

SAMPLING MECHANISM FOR CAN TOP FEEDING APPARATUS

Filed Oct. 30, 1946 5 Sheets-Sheet 1

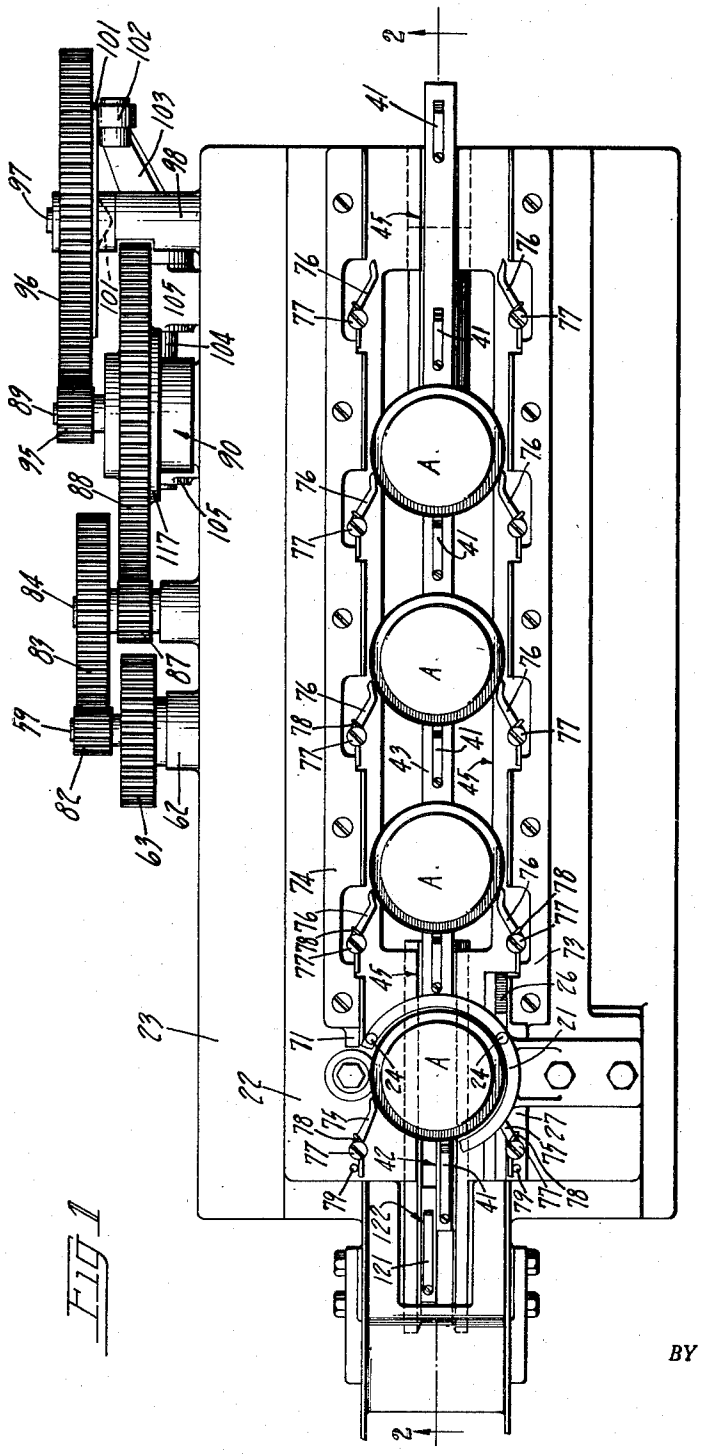


FIG 1

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SAMPLING MECHANISM FOR CAN TOP FEEDING APPARATUS

Filed Oct. 30, 1946 5 Sheets-Sheet 2

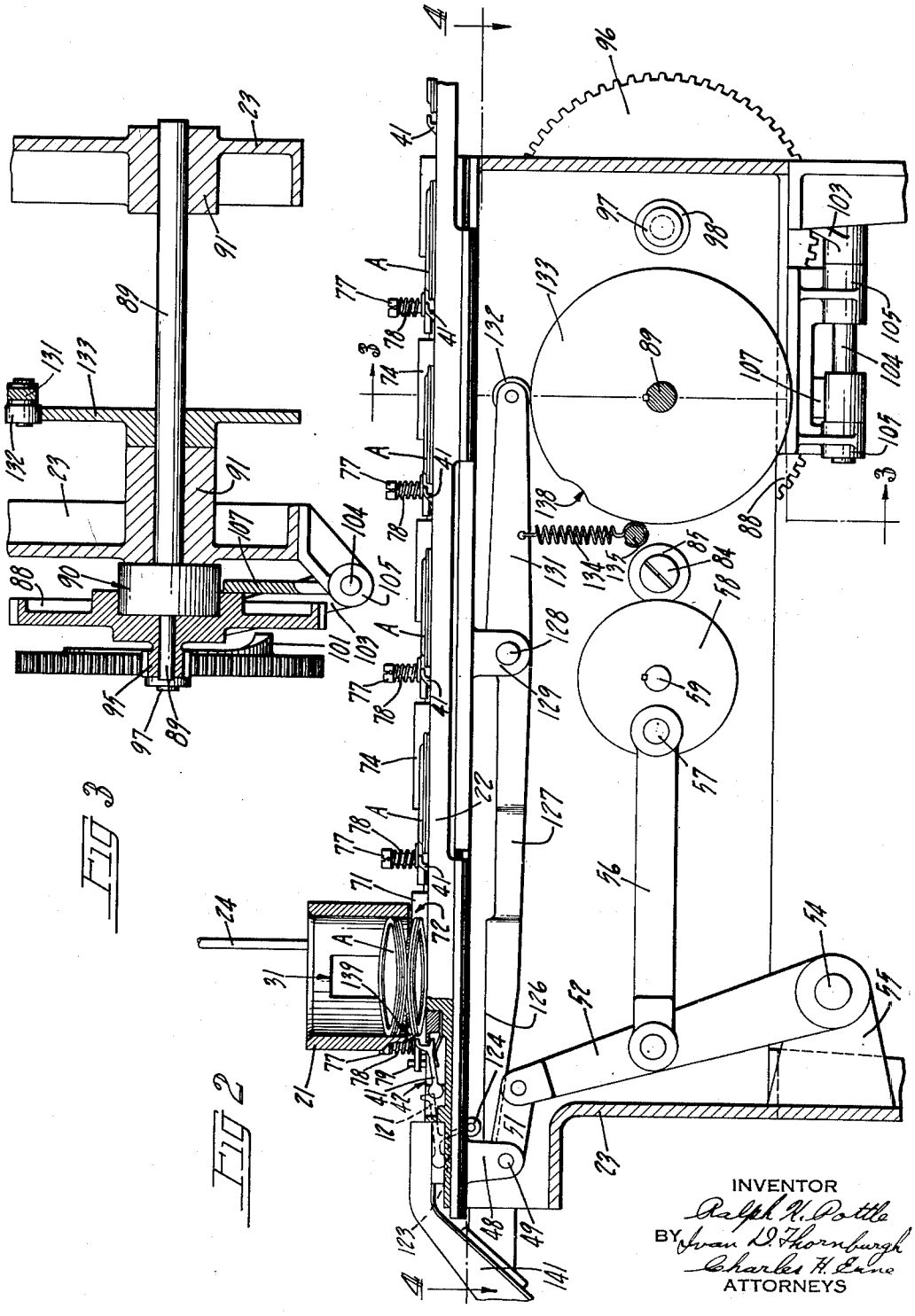


Fig 3

Fig 2

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SAMPLING MECHANISM FOR CAN TOP FEEDING APPARATUS

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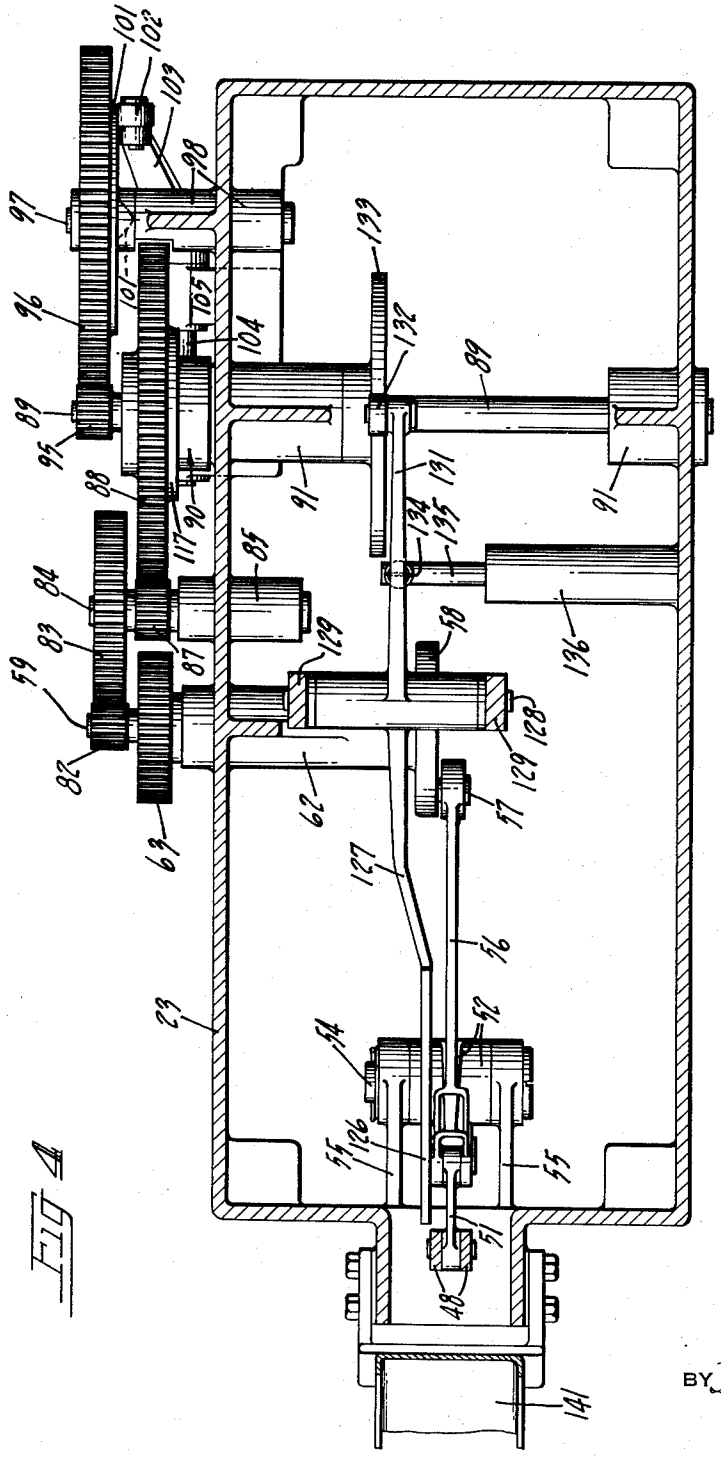


FIG 4

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SAMPLING MECHANISM FOR CAN TOP FEEDING APPARATUS

Filed Oct. 30, 1946 5 Sheets-Sheet 4

Fig 5

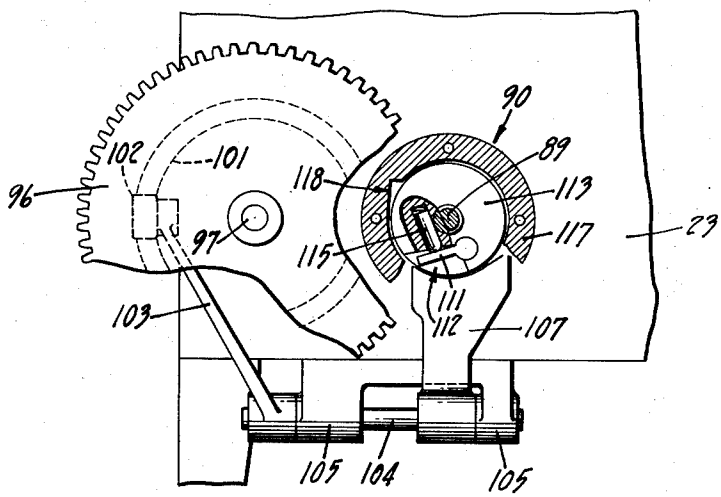
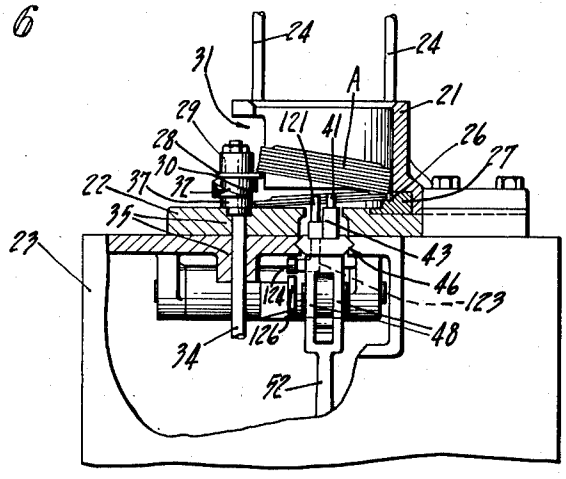


Fig 6



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SAMPLING MECHANISM FOR CAN TOP FEEDING APPARATUS

Filed Oct. 30, 1946 5 Sheets-Sheet 5

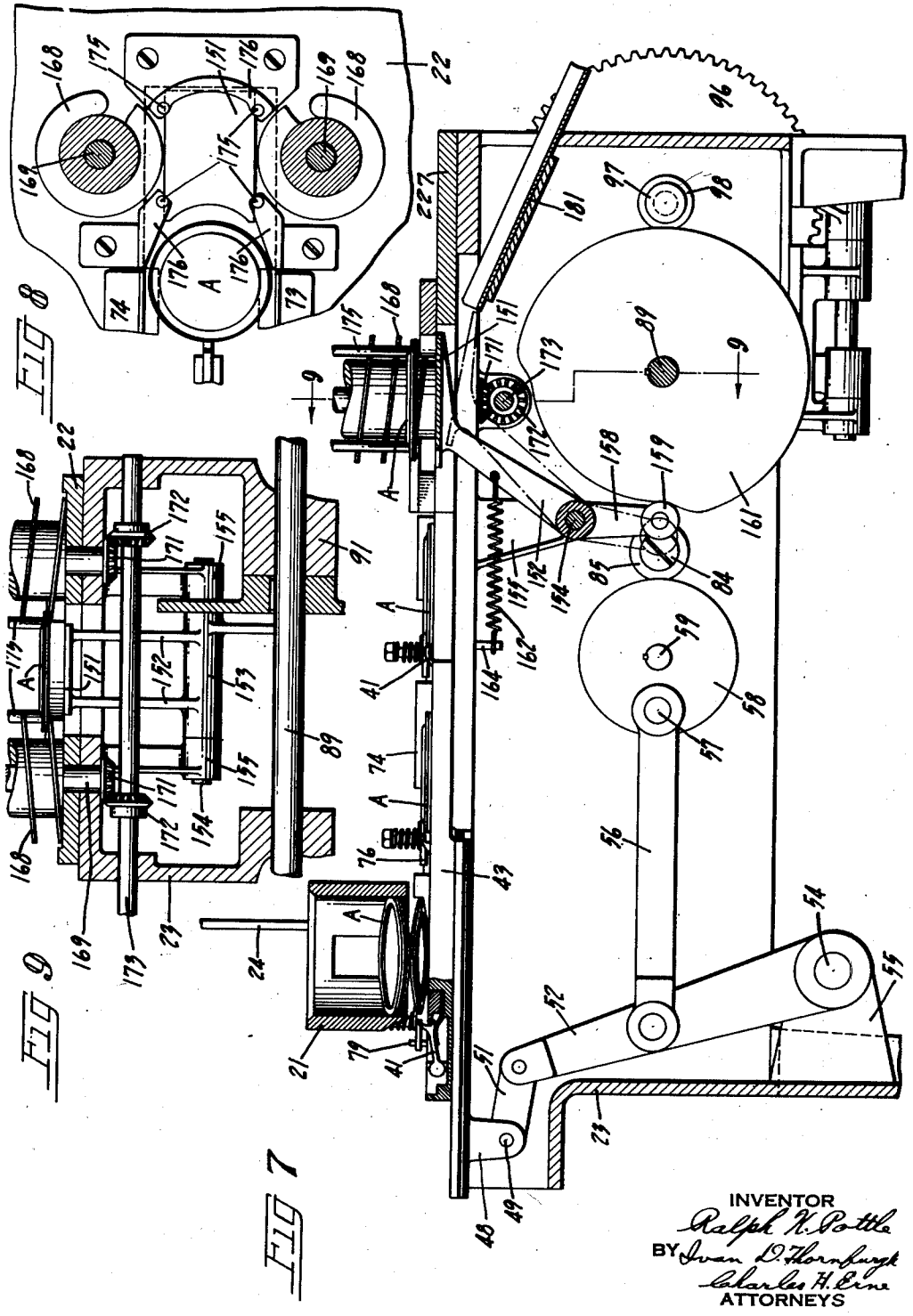


FIG 8

FIG 9

FIG 7

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2,601,785

UNITED STATES PATENT OFFICE

2,601,785

SAMPLING MECHANISM FOR CAN TOP FEEDING APPARATUS

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Application October 30, 1946, Serial No. 706,683

14 Claims. (Cl. 73—421)

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The present invention relates to a machine for counting and feeding flat articles such as can ends and the like and has particular reference to a machine in which some of the articles are diverted for inspection purposes at the termination of each count of a predetermined number of articles.

An object of the invention is the provision of a counting and feeding machine wherein flat articles are fed in a continuous procession without any interruption during counting of a predetermined number of the articles and then the counted articles are advanced along a path of travel for subsequent operation or for packing and storing.

Another object is the provision of such a machine wherein a predetermined number of articles are diverted for inspection purposes after the completion of every count so that a check may be had on the articles being advanced.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a top plan view of a machine embodying the instant invention, with parts broken away;

Fig. 2 is a longitudinal section taken substantially along the line 2—2 in Fig. 1, with parts broken away;

Fig. 3 is a transverse section taken substantially along the broken line 3—3 in Fig. 2, with parts broken away;

Fig. 4 is a top plan section taken substantially along the line 4—4 in Fig. 2, with parts broken away;

Fig. 5 is a partial side elevation showing a clutch detail, with parts broken away and parts in section;

Fig. 6 is an end elevation as viewed from the left in Figs. 1 and 2, with parts broken back and parts shown in section;

Fig. 7 is a view similar to Fig. 2 and showing a modified form of the invention, parts being broken away;

Fig. 8 is a fragmentary top plan view of the machine shown in Fig. 7; and

Fig. 9 is a sectional view taken substantially along the broken line 9—9 in Fig. 7.

As a preferred embodiment of the instant invention the drawings illustrate a machine for counting out a predetermined number of sheet metal can ends A and for advancing them along a line of travel for other operations or for packing into containers for shipment and storage. In the instant invention 250 can ends are counted out and advanced and following this, two or more ends as the case may require, are set aside for inspection purposes.

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The operation of the machine is continuous, the counting, feeding and inspecting operations being effected without any interruption in the flow of can ends through the machine. The can ends A to be counted and advanced are received from any suitable source of supply in a continuous procession. If desired these can ends may come directly from the presses which produce them.

The can ends as they are received in the machine fall into position on top of a stack of such ends located in a magazine 21 (Figs. 1, 2 and 6) which is bolted to a plate 22 mounted on top of a frame 23 which constitutes the main frame of the machine. Guide rods 24 secured in the top of the magazine keep the ends in place on the stack.

The can ends in the magazine are disposed at an angle to the horizontal, the lowermost can end in the stack being supported at two oppositely disposed points adjacent its outer edge and transversely of the machine. The lowermost edge portion of this can end rests on a stationary step 26 formed in a guide rail 27 secured to the plate 22 and extending through the magazine 21. The opposite upper edge portion of the can end rests on a ledge 28 of a rotatable cut off knife or element 29 which is disposed in an opening 31 in the side of the magazine.

The cut-off knife 29 is cylindrical in shape and is formed with a wide spiral thread 32 which extends out to and is an extension of the ledge 28. This arrangement provides a wedge shaped cut-off blade 30, which is mounted on the upper end of a drive shaft 34 journaled in bearings 35 formed in the plate 22 and in the frame 23. The shaft is rotated continuously in any suitable manner in time with the other moving parts of the machine. This is a conventional cut-off device used in many can making machines.

Rotation of the cut-off knife 29 separates the two lowermost can ends at the bottom of the stack in the magazine. This is effected by the rotating cut-off blade 30 at the upper end of the groove 32, cutting in between the second can end from the bottom and the can end next above.

Hence for each rotation of the cut-off knife 29, one pair or two can ends as a unit are separated from the remaining can ends in the stack and are moved down through the spiral groove in the

knife. The guide rail 27 functions as a hinge point. At the lowermost end of the spiral groove 32 the pair of can ends drop free of the cut-off knife and come to rest on the plate 22. They are then in an opposite inclined position with the one edge portion still supported on the step 26 of the guide rail 27 and the opposite edge portion supported on the plate 22. A shoulder 37 on the bottom of the cut-off knife temporarily retains the two ends in this position.

While in this downwardly inclined position the pair of can ends are fed as a unit from the magazine 21 and are advanced along a straight line path of travel for subsequent operations or for packing as hereinbefore mentioned. This advancement of the can ends is effected by a plurality of spring held feed dogs 41 (Figs. 1 and 2) which are disposed in spaced recesses 42 formed in a reciprocating feed or stroke bar 43 (see also Fig. 6). The stroke bar extends longitudinally of the machine for substantially its full length in an opening 45 formed in the plate 22. The bar operates in a slide-way 46 formed in the machine frame 23.

The feed bar 43 is reciprocated through a forward or feeding stroke and thence through a return stroke in time with the separation of the can ends from the stack within the magazine, there being one feeding stroke for each pair of can ends. For this purpose the feed bar is formed with a pair of depending lugs 48 (Fig. 2) which carry a pivot pin 49 mounted in one end of a short link 51. The opposite end of the link is pivotally carried on the upper end of an actuating arm 52. This arm is mounted on a pivot pin 54 carried in a pair of spaced bearing blocks 55 (see also Fig. 4) which extend inwardly from the machine frame 23.

Intermediate its ends, the arm 52 is pivotally connected to the outer end of a crank link 56. The inner end of the link is mounted on a crank pin 57 secured in a crank disc 58 (see Figs. 2 and 4) keyed to a rotatable drive shaft 59 which may be the main drive shaft of the machine. The drive shaft is journaled in a long bearing 62 formed on the machine frame 23. This drive shaft is rotated continuously in any suitable manner, as for example through a gear 63 (Fig. 4), at a speed which gives it one rotation for each pair of can ends separated by the cut-off knife 29 from the bottom of the stack of ends in the magazine 21. Thus the speed of the drive shaft is timed with the separation of the can ends. This provides proper reciprocation of the feed bar 43 in time with the separation of the can ends.

On a forward or feeding stroke of the feed bar 43 its feed dog 41 engaging behind the pair of can ends A separated from the stack in the magazine 21 advances these two can ends along the guide rail 27 and a cooperating parallel rail 71 which is disposed adjacent the cut-off knife 29. A clearance opening 72 formed in the side of the magazine adjacent its base permits of this feeding of the can ends from the magazine. The step 26 of the rail 27 is tapered downwardly along this path of travel so that the pair of can ends shifts from an inclined position into a horizontal position as the ends advance along the rail.

At the end of the feeding stroke, the feed bar 43 moves back through a return stroke to its original position, leaving the fed pair of can ends in their advanced position for further advancement on succeeding strokes of the feed bar. Guide rail extensions 73, 74 of the rails 27, 71 are

provided for guiding the can ends through the machine during succeeding strokes of the feed bar.

At the time the feed bar begins this back stroke the next pair of can ends to be advanced has already been separated from the remainder of the stack in the magazine. Hence during the return stroke, the feed dog 41 engages this separated pair of ends and is depressed as the dog travels back under them.

The separated can ends are held against backward movement during this travel of the feed dog, by a pair of holding fingers 75 (Figs. 1 and 2) which are located one on each side of the separated can ends. The can ends in advance of the first pair are held by pairs of similar fingers 76. These fingers are mounted on pivot pins 77, one of which is secured in the guide rail 27 while the others are fastened in the plate 22. A coil spring 78 around each pin normally holds the fingers in an inwardly projected position. A stop pin 79 adjacent a tail piece on each of the fingers 75, and secured in the plate 22, limits the inward travel of the fingers 75. In like manner a necked-in portion of the two guide rail extensions 73, 74 adjacent a tail piece of each finger 76 permits their travel. Both of these stop elements permit outward movement for a purpose which will be hereinafter explained.

In the instant machine, 250 can ends are to be counted out and advanced before diversion of the can ends for inspection purposes. This is the equivalent of 125 unitary pairs of can ends as fed from the magazine 21 by the feed bar 43. Thus the feeding of 250 can ends requires half the number of feeding strokes of the feed bar.

The counting of these required can ends and strokes of the feed bar 43 is effected by a simple gear counting mechanism which includes a properly proportioned continuously operating gear train and a clutch device. For this purpose the drive shaft 59 (Figs. 1, 2 and 4) carries on its outer end a pinion 82 which meshes with and drives an intermediate idler gear 83. The idler gear is mounted on a short idler shaft 84 journaled in a bearing 85 formed in the machine frame 23. The idler shaft is continuously rotated.

The idler shaft 84 carries a driving pinion 87 which meshes with and drives a cam shaft gear 88. This gear is loosely mounted on one end of a normally stationary cam shaft 89 which carries a one revolution clutch 90 (Figs. 3 and 5). The cam shaft is carried in bearings 91 formed in the machine frame 23. The gear 88 rotates continuously at a speed 21 times slower than the feed bar drive shaft 59. In other words the cam shaft gear makes one revolution for every 21 revolutions of the drive shaft and for the feeding of 21 sets or pairs of can ends.

The cam shaft gear 88 is formed integrally with a driving pinion 95 which meshes with and drives a clutch gear 96. This clutch gear is mounted on a short shaft 97 which is journaled in a long bearing 98 formed in the machine frame 23. This clutch gear completes the counting gear train and is continuously rotated at a speed of one revolution for every 125 pairs of can ends fed by the feed bar 43.

Hence during one complete cycle of operation of the machine, the reciprocating feed bar 43 continuously feeds 125 pairs of can ends A while the counting gear train operates to rotate the clutch gear 96 through one complete revolution. As the feed bar 43 moves forward through its

125th feeding stroke and thus advances the 125th pair of can ends, the clutch gear 96 completes its single revolution. Thereupon the clutch 90 is operated and this sets the cam shaft 89 into motion for one complete revolution.

Operation of the clutch 90 is effected by a cam 101 (Figs. 3, 4 and 5) which is formed on the side of the clutch gear 96. The cam operates against a cam roller 102 which is carried on the upper end of a lever 103. The lower end of the lever is mounted on a rocker shaft 104 carried in a pair of spaced bearings 105 which depend from the machine frame 23. Between the bearings the rocker shaft 104 carries a flapper plate 107 of the clutch 90.

The flapper plate 107 normally is in a position to engage against a clutch dog 111 (Fig. 5). The dog is pivotally mounted in a recess 112 formed in a clutch barrel 113 of the clutch 90. The clutch barrel is secured to the cam shaft 89. The dog within the recess 112 is backed up by a spring barrel 115 located in a bore in the clutch barrel 113.

As the clutch gear 96 approaches the end of its single revolution, its cam 101 rocks the lever 103 and the flapper plate 107 inwardly. This movement of the flapper plate releases the clutch dog 111 from its flapper plate engaging position and hence its spring barrel 115 forces the dog outwardly. The clutch dog thus engages the inner surface of a clutch ring 117 which surrounds the clutch barrel and which is formed on the continuously rotating cam shaft gear 88. The outer end of the released clutch dog immediately falls into a notch 118 formed in the rotating clutch ring 117. This locks the gear 88 and the cam shaft 89 together for one complete rotation of the cam shaft.

During this one revolution of the cam shaft 89 the flapper plate 107 is returned to its normal position so as to reengage the clutch dog 111 at the end of the rotation. Engagement of the dog releases it from the clutch ring notch 118 and the cam shaft thereupon stops while the gear 88 continues to rotate through a new cycle.

The single rotation of the cam shaft 89 effects the discharge from the magazine 21 of one pair of can ends for inspection purposes, as hereinbefore mentioned. This is brought about by a discharge dog 121 (Figs. 1, 2 and 6) which is pivotally mounted in a recess 122 formed in the feed bar 43 adjacent and to the rear of the feed dog 41. This dog is normally depressed below the upper surface of the feed bar and hence is inactive during the feeding of the 125 pairs of can ends.

Intermediate its ends, the discharge dog 121 is formed with a depending arm 123 (Figs. 2 and 6) which carries a roller 124. The roller 124 of the discharge dog is disposed adjacent a longitudinal track 126 which extends along and below the path of travel of the feed bar 43. This track is formed on the outer end of a lever 127 (see also Fig. 4) which is mounted on a pivot shaft 128 carried in a pair of spaced bearings 129 formed on the machine frame 23. This lever is formed with an inner arm 131 which carries a cam roller 132. The cam roller operates against an edge cam 133 mounted on the cam shaft 89. A spring 134 stretched from the arm 131 to a pin 135 in a lug 136 of the bearing 85, keeps the cam roller in engagement with the cam.

During normal operation of the feed bar 43 the roller 124 of the discharge dog 121 is out of engagement with the track 126 and this keeps the dog depressed so that it readily passes under the can ends in the magazine 21. However, just as soon as the feed bar 43 begins the return stroke following its 125th feeding stroke, which is coincident with the beginning of the rotation of the cam shaft 89, the cam roller 132 on the arm 131 falls into a notch 138 (Fig. 2) in the cam 133 and this rocks the lever 127 upwardly. This upward movement of the lever lifts the track 126. The track engages and raises the dog roller 124 and this lifts the discharge dog 121 above the top surface of the feed bar.

With the discharge dog 121 in an elevated position during the 125th return stroke of the feed bar, the dog engages and discharges from the magazine 21 the 126th pair of can ends A. The dog pushes this pair of ends backward, past the holding fingers 75 (Figs. 1 and 2), through an opening in the side of the magazine and delivers these ends into a chute 141 secured to the machine frame 23. The chute directs these two can ends to any suitable place of deposit for inspection purposes.

As soon as the discharge dog 121 has delivered the 126th pair of can ends into the chute 141 for inspection, the cam roller 132 of the arm 131 rides out of the cam notch 138. This rocks the lever 127 back into its original position and thus permits the discharge dog 121 to fall back into its depressed position in the feed bar.

Since the 126th pair of can ends has been diverted for inspection purposes on the 125th back stroke of the feed bar 43, there are no separated can ends ready in the magazine to be fed forward on the next following or 126th feeding stroke of the feed bar. Hence on this stroke of the feed bar no can ends are fed forward. This creates a space or skip in the continuous feeding operation of the feed bar and thus marks the termination of one feeding cycle of 125 pairs of can ends. The cam shaft 89 upon the completion of this cycle ceases rotation, through withdrawal of the clutch dog 111 as hereinbefore mentioned, and remains stationary through the following feeding operations of the feed bar 43 until another batch of 250 can ends have been counted out and advanced as described above.

As a modified form of the invention, Figs. 7, 8 and 9 of the drawings illustrate a machine which is similar to the preferred form just explained but in which the means for discharging the can ends for inspection purposes are slightly different. In this modified form of the invention the guide rails 73, 74 along which the can ends A advance in pairs, are cut short and terminate adjacent a continuing movable platform 151 disposed in a recess formed in the plate 22. This platform is formed on the upper ends of a pair of arms 152 projecting upwardly from a hub 153 carried on a shaft 154 journaled in a pair of spaced bearing brackets 155 depending from the table of the main frame 23.

The hub 153 is formed with a depending cam arm 158 which carries a cam roller 159 which operates against an edge cam 161 mounted on the cam shaft 89 in place of the usual cam 133. A spring 162 holds the cam roller against the cam. One end of the spring is hooked into one of the platform arms 152 while the other end is secured to a pin 164 secured in the table of the main frame. The cam 161, like the cam 133 in the preferred form of the invention, is normally stationary and thus holds the platform stationary.

Can ends advanced along the guide rails 73, 74

by the stroke bar 43 are deposited on the platform 151 on the forward stroke of the bar by the last feed dog 41 on the bar. These can ends are immediately picked up from the platform for further advancement, by feeding devices comprising a pair of spaced and parallel, vertically disposed feed screws or worms 168 located above and adjacent opposite sides of the platform.

The feed screws 168 are mounted on vertical shafts 169, the lower ends of which extend through the plate 22 and are journaled in bearings formed in the table of the main frame 23. The screws are continuously rotated in unison and in opposite directions by bevel gears 171 which are carried on the lower ends of the screw shafts. These gears mesh with and are driven by driving gears 172 carried on a drive shaft 173 journaled in bearings formed in the main frame. The drive shaft 173 is rotated in any suitable manner in time with the other movable parts of the machine.

Hence as a pair of can ends A are received on the platform 151, the feed screws 168 immediately pick them up and convey them upwardly to a suitable place of deposit. The moving can ends are guided during this vertical travel by a plurality of vertically disposed guide bars 175 disposed adjacent the screws. There are four of these guide bars and they are carried in brackets 176 bolted to the plate 22.

As in the preferred form of the invention, 125 pairs of can ends A are advanced along the guide rails 73, 74 and are picked up by the feed screws 168 before the one revolution clutch 90 is tripped to set the cam shaft 89 in operation to throw out one or more pairs of following can ends for inspection purposes. This tripping of the clutch 90 is effected just as the stroke bar 43 is about to move forward through its 126th stroke to deliver the 126th pair of can ends onto the platform 151.

Setting of the cam shaft 89 into motion by the tripping of the clutch 90 rotates the cam 161 through one revolution. As soon as the cam begins to turn, the cam roller 159 rides up onto a long high portion of the cam and this immediately rocks the platform 151 downwardly into an inclined position as shown in dotted lines in Fig. 7. In this position, the platform is below and in spaced relation to the lower level of the feed screws 168 and its forward end is in alignment with a downwardly inclined discharge chute 181 secured to the main frame 23. This movement of the platform takes place just as the stroke bar begins to move forward on its 126th stroke. The platform remains in this depressed position for approximately three quarters of the revolution of the cam 161, which is sufficient time to permit the stroke bar 43 to complete its forward stroke and to move back through about one half of its return stroke.

Hence the stroke bar 43 delivers the 126th pair of can ends onto the depressed, incline positioned platform and instead of these ends being picked up by the feed screws 168, the ends pass directly over the platform and enter the discharge chute 181. The chute directs them to any suitable place of deposit for inspection purposes. It is in this manner that certain of the can ends after the completion of each count of 125 pairs, are diverted for inspection purposes.

Just before the cam 161 completes its one revolution, the cam roller 159 rides off the high portion of the cam. This returns the platform 151 to its normal can end receiving position for the reception of the next 125 pairs of can ends to be picked up by the feed screws 168. The platform is in this position when the stroke bar 43 completes its 126th return stroke.

As soon as the bar completes this return stroke the clutch 90 operates to stop the rotation of the cam shaft 89 as in the preferred form of the invention. The cam 161 thereupon comes to rest and thus holds the platform 151 in its elevated position as described above for the duration of the feeding of the next batch of can ends.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a machine for counting and feeding flat articles, the combination of a magazine for holding a supply of articles, a reciprocable feed bar adjacent said magazine, actuating devices for moving said feed bar through a feeding stroke and a return stroke, means on said feed bar for advancing the articles, means for counting a plurality of feeding strokes of said feed bar to advance a predetermined number of articles, discharge means also on said feed bar and operable only on a return stroke after said predetermined number of articles has been advanced, and means connected with said counting means for operating said discharge means to divert from said magazine a second number of articles for inspection purposes.

2. In a machine for counting and feeding flat articles, the combination of a magazine for holding a supply of articles, a reciprocable feed bar adjacent said magazine, actuating devices for moving said feed bar through a feeding stroke and a return stroke, a feed dog on said feed bar for advancing the articles, means for counting a plurality of feeding strokes of said feed bar to advance a predetermined number of articles, a normally inactive discharge dog also on said feed bar and operable only on a return stroke after said predetermined number of articles has been advanced, and means connected with said counting means for activating said discharge dog to divert from said magazine other articles for inspection purposes.

3. In a machine for counting and feeding flat articles, the combination of article supplying means, a reciprocable feed bar adjacent said article supplying means, actuating devices for moving said feed bar through a feeding stroke and a return stroke, a feed dog on said feed bar for advancing from said article supplying means during a plurality of feeding strokes a predetermined number of articles, a normally inactive discharge dog also on said feed bar and operable only on a return stroke after said predetermined number of articles has been advanced for diverting from said article supplying means a second predetermined number of articles for inspection purposes, and means for activating said normally inactive discharge dog on said return stroke for bringing it into article diverting position.

4. In a machine for counting and feeding flat articles, the combination of articles supplying means, a reciprocable feed bar adjacent said article supplying means, actuating means for

moving said feed bar through a feeding stroke and a return stroke, means on said feed bar for advancing from said article supplying means during a plurality of feeding strokes a predetermined number of articles, normally inactive means also on said feed bar and operable only on a return stroke after said predetermined number of articles has been advanced for diverting from said article supplying means a second predetermined number of articles for inspection purposes, and means for activating said normally inactive means on said return stroke for rendering it operable for diverting said articles from said article supplying means.

5. In a machine for counting and feeding flat articles, the combination of article supplying means, a reciprocable feed bar adjacent said article supplying means, actuating devices for moving said feed bar through a feeding stroke and a return stroke, means on said feed bar for advancing a predetermined number of articles from said article supplying means during a plurality of feeding strokes, a normally inactive discharge dog carried in said feed bar in a depressed position, and means operable on a return stroke of said feed bar following the advancement of said predetermined number of articles for raising said inactive discharge dog into operative position for diverting from said article supplying means a second predetermined number of articles for inspection purposes.

6. In a machine for counting and feeding flat articles, the combination of article supplying means, a reciprocable feed bar adjacent said article supplying means, actuating devices for moving said feed bar through a feeding stroke and a return stroke, means on said feed bar for advancing from said article supplying means during a plurality of feeding strokes a predetermined number of articles, a normally inactive discharge dog carried in said feed bar in a depressed position, an actuating element carried on said inactive discharge dog, and means operable on a return stroke of said feed bar following the advancement of said predetermined number of articles and engageable with said actuating element on said inactive discharge dog for raising said dog into operative position for diverting from said article supplying means a second predetermined number of articles for inspection purposes.

7. In a machine for counting and feeding flat articles, the combination of a magazine for holding a supply of articles, a reciprocable feed bar adjacent said magazine, actuating devices for moving said feed bar through a feeding stroke and a return stroke, means on said feed bar for advancing from said magazine during a plurality of feeding strokes a predetermined number of articles, a normally inactive discharge dog carried in said feed bar in a depressed position, an actuating element carried on said inactive discharge dog, actuating means engageable with said actuating element for raising said discharge dog into operative position for diverting from said magazine a second predetermined number of articles for inspection purposes, and cam means operable in time with said feed bar actuating devices for bringing said actuating means into engagement with the discharge dog on the return stroke of said feed bar following the advancement of said predetermined number of articles for separating articles for inspection purposes.

8. In a machine for counting and feeding flat articles, the combination of article supplying means, means for separating said articles from said article supplying means, an article support adjacent said article supplying means for retaining the separated articles in a predetermined position, feeding means for engaging and advancing a predetermined number of said articles along said support after they are separated from said article supplying means, counting means connected with said feeding means for counting the feeding operations of said feeding means to count out a predetermined number of articles advanced, and means moved by said counting means and operable after the advancement of all of said counted articles for diverting a subsequently separated number of articles from beyond the engagement of said feeding means to leave said articles for inspection purposes.

9. In a machine for counting and feeding flat articles, the combination of article supplying means, a platform for receiving the articles from said article supplying means, counting means for counting out a predetermined number of articles received on said platform, feeding devices disposed adjacent said platform for removing the received articles from said platform and for advancing the same, shifting means connected between said platform and said counting means for shifting said platform away from said feeding devices after the advancement of said predetermined number of articles to divert the next received articles away from said feeding devices, and means for removing the diverted articles from said platform for inspection purposes.

10. In a machine for counting and feeding flat articles, the combination of a source of supply of articles, feeding means for advancing said articles from said source of supply, a platform for receiving the articles from said feeding means, feeding devices disposed adjacent said platform for removing the received articles from said platform for further advancement, counting means for counting the feeding operations of said feeding means to count out a predetermined number of articles advanced into said feeding devices, means operable by said counting means for shifting said platform for diverting a said article from said feeding devices for inspection purposes after the advancement of said predetermined number of articles, and means for receiving said diverted articles.

11. In a machine for counting and feeding flat articles, the combination of article supplying means, an article support located adjacent said article supplying means and extending laterally therefrom, means for separating said articles from said article supplying means and for positioning them on said support, feeding means for advancing the separated articles along said article support, a gear train connected with said feeding means for counting the feeding operations of said feeding means to count out a predetermined number of articles advanced, a one-revolution clutch operable by said gear train at the termination of a count of said predetermined number of articles, cam means operable by said clutch through a predetermined cycle, and means operable by said cam means for removing from said support a second number of articles for inspection purposes.

12. In a machine for counting and feeding flat articles, the combination of article supplying means, an article support located beneath said article supplying means and extending laterally therefrom, means for separating articles from

said article supplying means and for depositing the articles on said support, feeding means for advancing the separated articles along said support, counting means connected with said feeding means for counting the feeding operations of said feeding means to count out a predetermined number of articles advanced, and a vertically oscillatable member moved by said counting means and having cooperation with said feeding means after the advancement of said predetermined number of articles for removing articles for inspection purposes from said support.

13. In a machine for counting and feeding flat articles, the combination of article supplying means, an article support located adjacent said article supplying means and extending laterally therefrom, means for separating said articles from said article supplying means and for positioning them on said support, feeding means operable longitudinally of said support for advancing the separated articles from said article supplying means, counting means connected with said feeding means for counting the feeding operations of the feeding means to count out a predetermined number of articles advanced, an oscillatable discharge device laterally movable relative to said feeding means for removing articles from said support for inspection purposes, and cam means operable by said counting means after the advancement of said predetermined number of articles for actuating said discharge device.

14. In a machine for counting and feeding flat articles, the combination of article supplying means, feeding means for advancing said articles from said article supplying means, a platform disposed in the path of travel of said advancing articles for receiving the articles from said feeding means, counting means for counting a predetermined number of articles received on said platform, feeding devices for removing from said platform all articles constituting said counted predetermined number, and means connected between said platform and said counting means for shifting said platform periodically after the completion of said count for shifting a said article from position where it is removed in a different manner, it then being further advanced by said feeding means to permit its disposition for inspection purposes.

RALPH K. POTTLE.

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