Oct. 18, 1949. F. HUNTAR 2,484,830

CAN AND COVER FEEDING MECHANISM

Filed Sept. 25, 1946 4 Sheets-Sheet 1

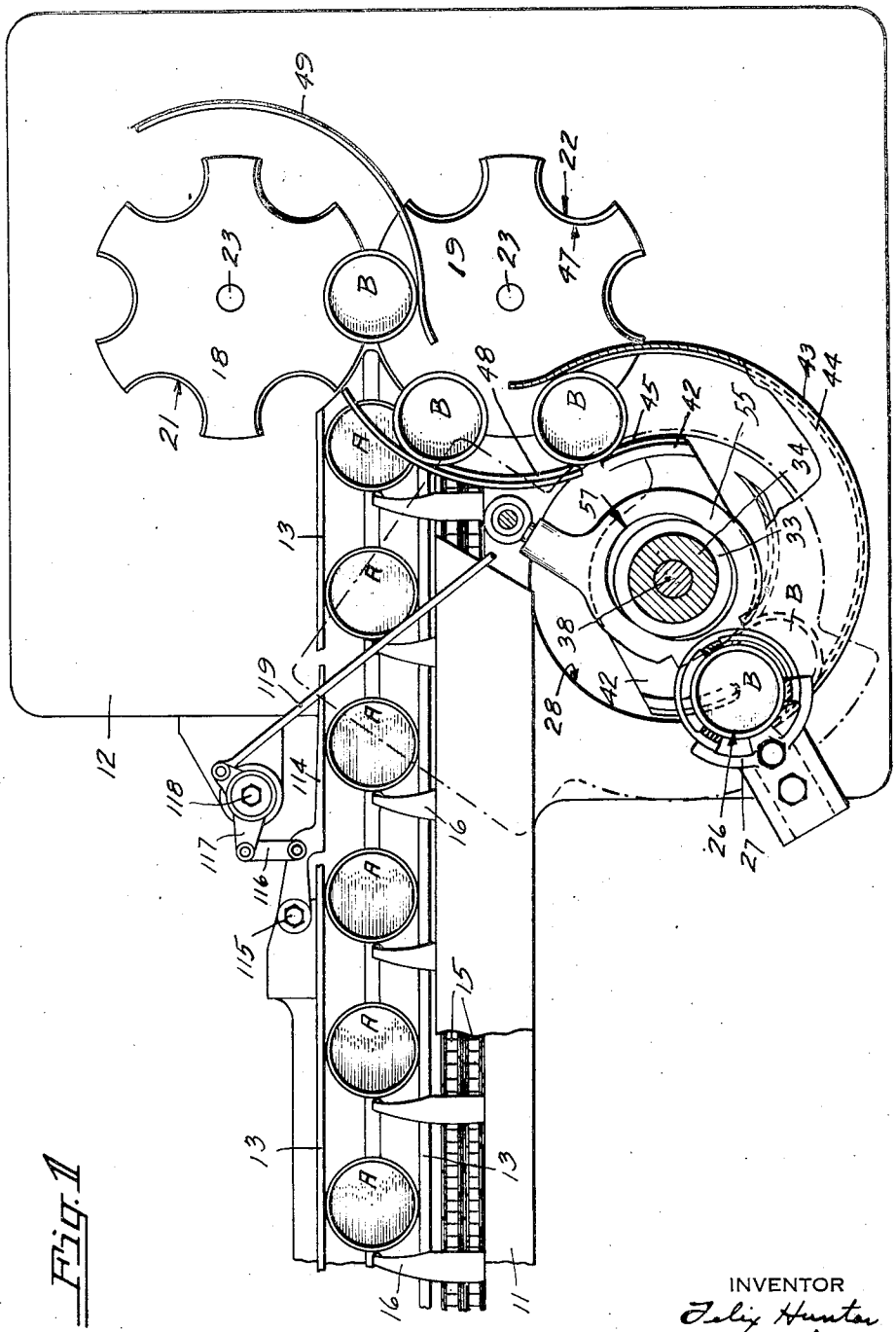


Fig. 1

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Fig. 2

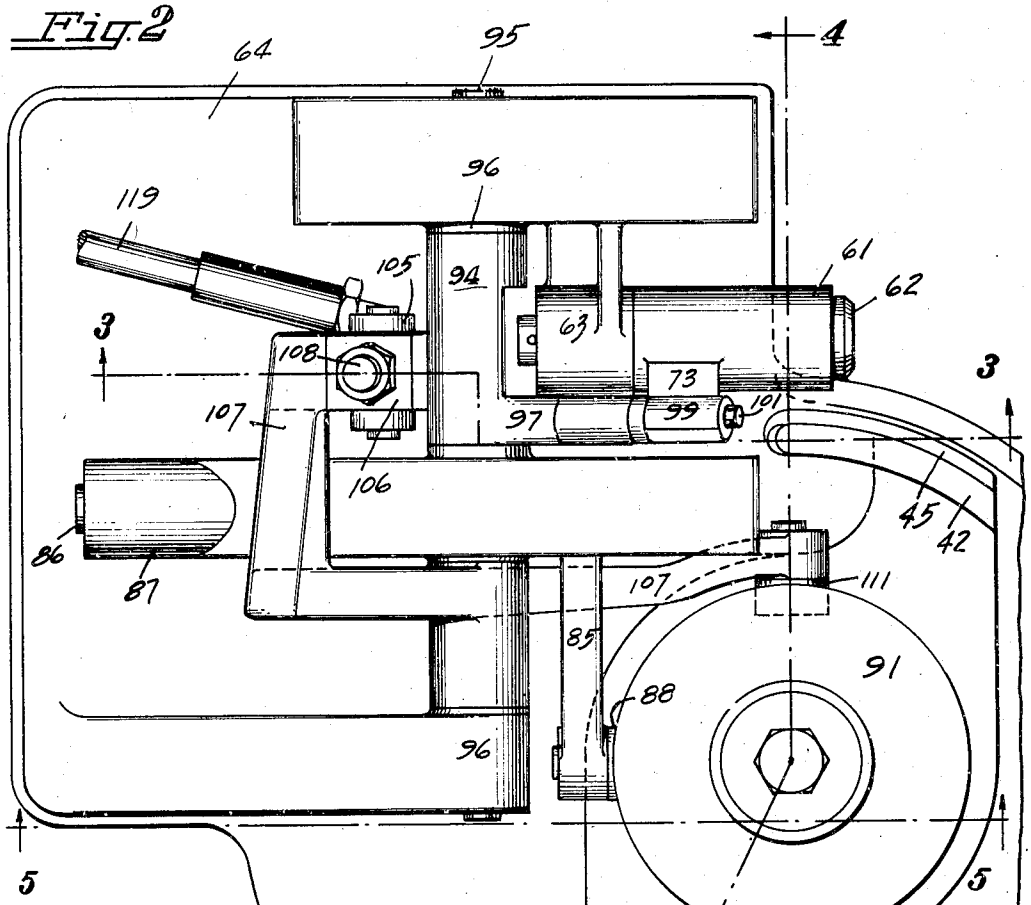
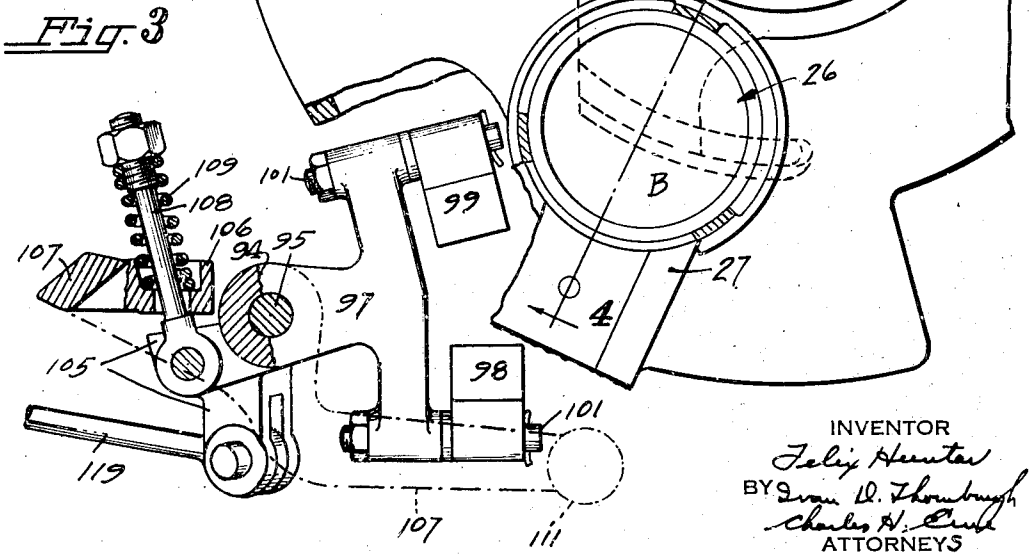


Fig. 3



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Filed Sept. 25, 1946 4 Sheets-Sheet 3

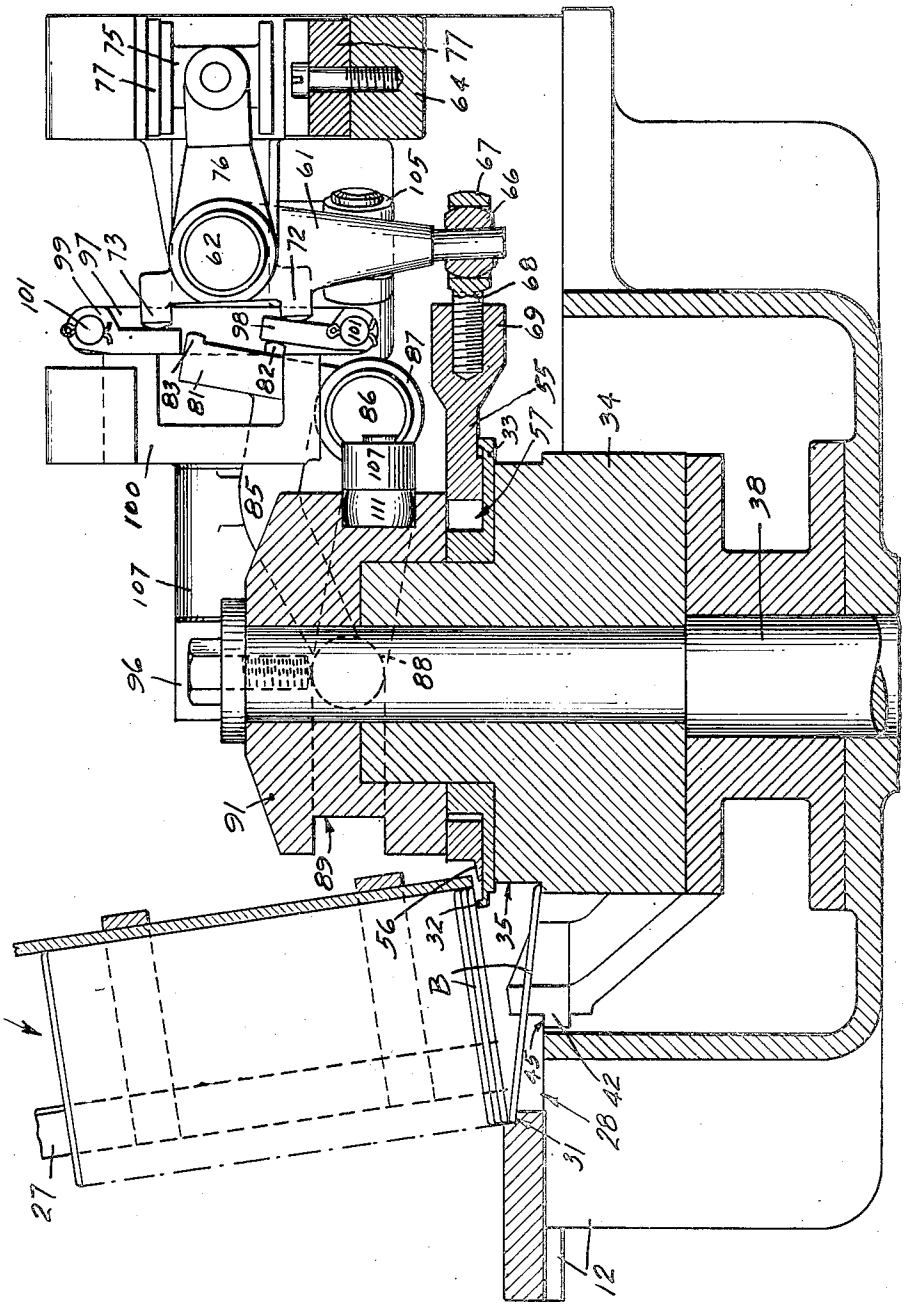


Fig. 4

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Filed Sept. 25, 1946 4 Sheets-Sheet 4

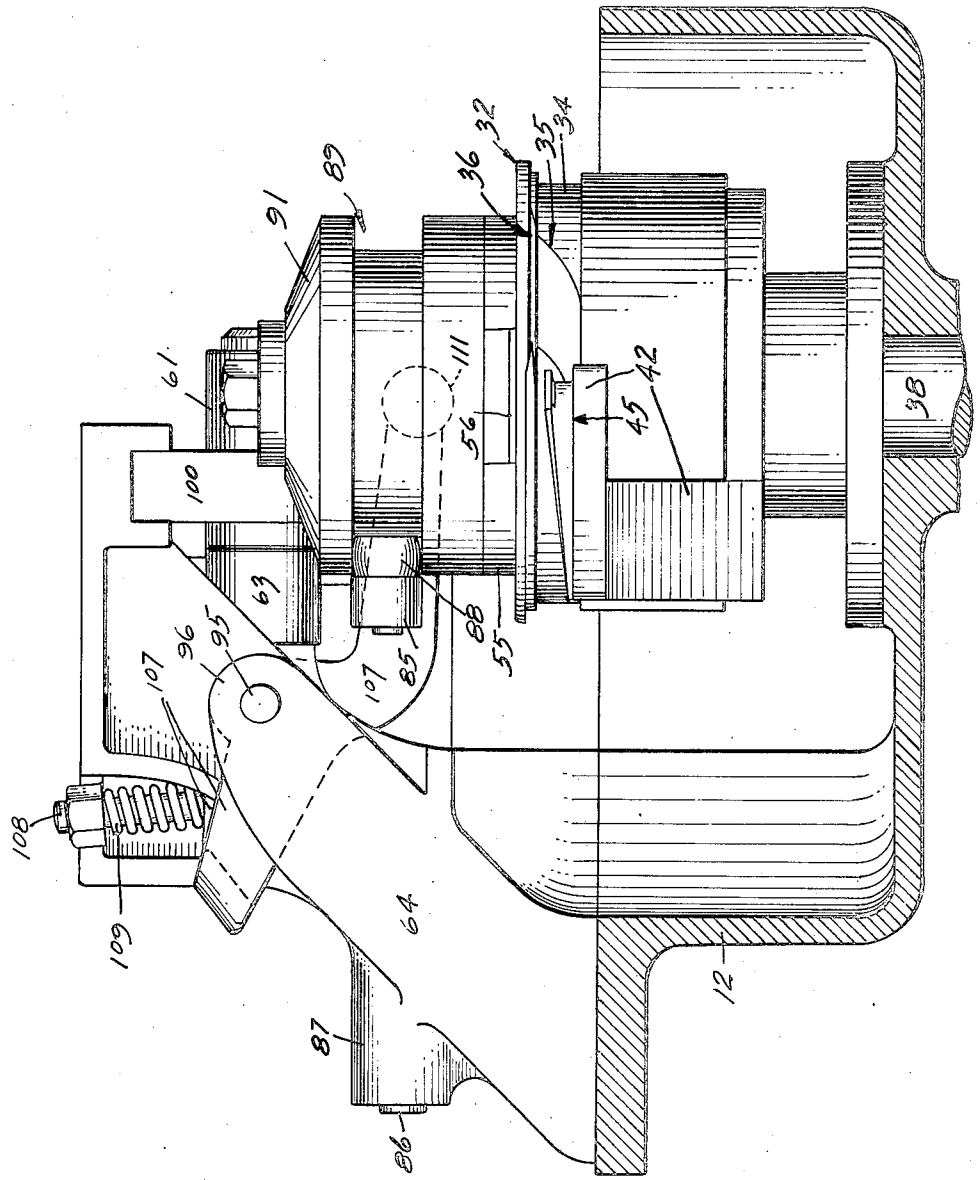


FIG. 5

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Patented Oct. 18, 1949 2,484,830

UNITED STATES PATENT OFFICE

2,484,830

CAN AND COVER FEEDING MECHANISM

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Application September 25, 1946, Serial No. 699,129

7 Claims. (Cl. 113—114)

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The present invention relates to a can and a can cover or end feeding mechanism for can making machinery and has particular reference to an improved high speed cover feed which operates to feed covers only when cans are in place to receive them.

An object of the invention is the provision in a can and cover feeding mechanism of improved cover feeding devices wherein quick and accurate operation by a continuously moving trigger element may be had for nullifying the feeding of a cover when a can is missed and therefore a space occurs in a procession of cans moving continuously through the machine.

Another object is the provision of such an improved cover feeding device wherein most of the elements of the device remain stationary during normal feeding of the covers so that wear and tear on the device is reduced to a minimum.

Another object is the provision of such an improved cover feeding device wherein the normally stationary elements, after being tripped for rapid action, are set into motion only in timed relation with the continuously operating elements of the device.

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 portion of a can machine embodying the instant invention, with parts broken away;

Fig. 2 is an enlarged top plan view of the cover feeding mechanism associated with the machine illustrated in Fig. 1, with parts broken away; and

Figs. 3, 4 and 5 are sectional views taken substantially along the respective lines 3—3, 4—4 and 5—5 in Fig. 2, with parts broken away.

As a preferred embodiment of the instant invention the drawings illustrate principal parts of a machine in which either cans having a bottom end or can bodies without a bottom end (referred to hereinafter as cans A) are fed along a predetermined path of travel for receiving a cover or can end B, subsequently secured thereon in any suitable manner.

In the machine the cans A advance in a continuously moving procession and in an upright position along a table 11 (Fig. 1) formed as a part of a frame 12 which may be the main frame of the machine. The entering cans are maintained in a straight line by a pair of guide rails 13 between which they pass, the rails being secured to the table 11.

Advancement of the cans is effected in spaced-apart and timed order by a continuously moving chain conveyor 15 having feeding fingers 16 secured thereto and spaced along its length. The

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conveyor may be actuated by suitable sprockets which are rotated in any suitable manner in time with other moving parts of the machine.

Each advancing can A passes into a pair of rotating feed turrets 18, 19 (Fig. 1) being received into peripherally spaced turret pockets 21, 22. These turrets are mounted on vertical shafts 23, carried in the machine frame 12, the shafts being rotated in any suitable manner in unison and in time with the other moving parts of the machine.

At the time the can A moves into position between the turrets 18, 19 a cover B is positioned on the can. The covers are advanced from a supply stack of such covers in time with the advancement of the cans. This stack of covers is retained in a magazine 26 (Figs. 1, 2 and 4) having a silghtly inclined stack support 27 secured to the machine frame 12 adjacent the turret 19.

The lowermost cover B in the supply stack is disposed over an opening 28 in the machine frame 12. The edge of this lowermost cover, adjacent the stack support 27, rests on a ledge 31 (Fig. 4) formed on the stack support. Opposite the stack support, the edge of the cover is supported on a peripheral bead 32 formed on the upper surface of an annular, continuously rotating separator disk 33. This disk is secured to the upper face of a separator screw 34. Disk 33 has a pair of diametrically disposed spiral grooves 35 cut into its cylindrical outer surface. The upper or entrance ends of the grooves are adjacent the separator disk 33 and they communicate with a pair of diametrically disposed cutout notches 36 (Fig. 5) formed in the bead 32 and in the peripheral edge of the disk.

The separator disk 33 and its separator screw 34 constitute a divider element for separating the lowermost cover B from the stack. This element is mounted on a continuously rotating vertical shaft 38 which is journaled in suitable bearings formed in the machine frame 12. The shaft is rotated in any suitable manner in time with the other moving parts of the machine and through this rotation separates one cover from the stack for each half rotation of the element, i. e., one cover each time a notch 36 comes adjacent the stack. This is a conventional cover separator device.

In such a device, rotation of the separator element brings a cut-out notch 36 adjacent the inner supported edge of the cover B and thus permits the cover to enter the adjacent spiral groove 35. During the immediately following continued rotation of the separator element, the edge of the cover rides down along the spiral groove and this separates the cover from the remainder of the stack. This separating action also pivots the cover on the support ledge 31 bringing it into a nearly horizontal position. In this position the

cover is in the path of travel of a feed finger 42 which is mounted on and which rotates with the shaft 38.

The rotating finger 42 engages behind the separated cover and propels it along a curved guide rail 43 toward the feed turret 19. The cover during this travel is supported in part on ledges 44 formed on the guide rail 43 and on a ledge 45 formed on the finger. The guide rail is secured to the table 11. The finger deposits the cover into a pocket 47 formed in the feed turret 19 just above and concentric with a can pocket 22. There is one of these cover pockets for each of the can pockets. At such a time the can pocket is empty.

Thus the cover which has been deposited in the feed turret 19 is moved around in a circular path but in a lineal travel equal to the movement of the can moving over the table and along the guide rails 13. A curved guide rail 48 disposed adjacent the outer periphery of the turret retains the covers in their pockets. The cover and the can come into vertical alignment as the can enters between the feed turrets and the cover is deposited onto the can as the can enters into the turret pocket 22 just below the cover. The can and its cover remain in the feed turret 18 and are carried along a curved path of travel during which time the cover may be secured to the can. A curved guide rail 49 secured to the table 11 retains the can and its cover in place in the pockets 21 of the feed turret 18 during this travel.

Provision is made for nullifying the action of the cover separator element to prevent the feeding of a cover from the supply stack when a can is missing in the procession of cans entering the machine. This is effected in time with the advancement of the cans so that no cover will be fed unless there is a can to receive it.

Withholding of a cover B to prevent separation from the supply stack for feeding into the feed turret 19 is brought about by a normally stationary, annular slide or stop member 55 (Figs. 1 and 4) which rests on top of the separator disk 33 being confined for the most part within its cover support bead 32. Adjacent the cover magazine 26, the stop member 55 is formed with a stop ledge 56 which is insertable under the edge of the lowermost cover in the supply stack upon movement of the stop member toward the stack.

The stop member 55 is formed with a centrally disposed clearance opening 57 for the upper portion of the separator screw 34 and for the shaft 38, as best shown in Fig. 4. This clearance opening permits sliding of the stop member 55 across the top of the separator disk 33.

Movement of the stop member is effected by a shift lever or element 61 which is mounted on a pivot pin 62 secured in a boss 63 formed on a bracket 64 bolted to an upright portion of the machine frame adjacent the cover separator element. The lower end of the shift lever is formed with a universal joint ball 66 which operates in a ring section 67 of a bolt 68 threadedly secured in a boss 69 formed on the stop member 55 opposite its stop ledge 56.

The shift lever 61 is movable on its pivot pin 62 into two positions for shifting the stop member 55 and its stop ledge 56 into cover feeding or non-feeding relation to the separator cut-out notch 36. For this purpose the lever 61 is formed with two actuating buttons or projections 72, 73 disposed one on each side of the pivot pin 62.

Upon being shifted into one or the other of these positions, the shift lever 61 is held against movement in the opposite direction by a magnetic holding block 75 which is carried on an arm 76 projecting out from the lever. The holding block moves with the lever through a path of travel extending between two spaced permanent magnets 77 secured to the bracket 64. When the lever is at rest, its holding block 75 is in engagement with one of these magnets and hence is held against movement.

Actuation of the shift lever 61 through its actuating buttons 72, 73 is effected indirectly at the proper time by way of a continuously moving hammer 81 (Fig. 4) having a pair of spaced hammer heads 82, 83 projecting toward the rocker buttons 72, 73, respectively. These hammer heads are not in alignment with the shift lever buttons but move in a path of travel between and adjacent the buttons.

The hammer 81 is reciprocated toward and away from the shift lever buttons 72, 73 through an actuating stroke and thence through a return stroke by cam action in time with the feeding of the covers from their magazine 26. For this purpose the hammer 81 is formed on the inner end of a bell crank shaped cam lever 85 which is mounted on a pivot pin 86 carried in a boss 87 formed in the bracket 64. The outer end of the cam lever carries a cam roller 88 which operates in a cam groove 89 formed in a barrel cam 91 mounted on and rotated by the separator element shaft 38.

Since the separator element shaft 38 rotates through one half revolution for each cover fed from the magazine 26, the cam groove 89 is shaped to rock the cam lever 85 twice for each revolution of the cam 91. In this manner the hammer 81 is reciprocated once for each cover and in time with the feeding of the cover.

As long as there are no cans missing in the procession of cans moving through the machine, the hammer 81 reciprocates through idle strokes while the shift lever 61 is held stationary by the proper magnet 77 in cover feeding position. This insures feeding of the covers consecutively from the magazine 26. However, when a skip or miss in the procession of cans does occur, the shift lever 61 upon the next actuating stroke of the hammer is rocked to shift the stop ledge 56 under the edge of the lowermost cover in the stack and thus support the stack so that the lowermost cover cannot move down into the spiral groove 35 of the separator screw 34.

The indirect actuation of the shift lever 61 by the hammer 81 is effected through a normally stationary rocker arm 94 (Figs. 2 and 3) which is pivotally mounted on a shaft 95 carried in a pair of spaced bosses 96 formed on the bracket 64. The inner end of the rocker arm is formed with a forked rocker head 97 which carries a pair of loose fingers 98, 99 mounted on spaced pivot pins 101 secured in the head. The loose fingers when not in use engage against and are held against pivotal movement by a permanent magnet 100 (Figs. 4 and 5) carried on the bracket 64.

In the normal stationary position of the rocker arm 94, as when the shift lever 61 is in cover feeding position, the lower rocker finger 98 is interposed between the shift lever lower button 72 and the lower hammer head 82, as best shown in Fig. 4. In this position of the rocker arm 94 the upper finger 99 is disposed adjacent but out of alignment with the upper hammer head 83 of the hammer 81.

When a can space occurs in the procession of cans A moving along the table 11, the rocker arm

94 is rocked on its pivot shaft 95 and this interposes the upper finger 99 between the shift lever upper button 73 and the upper hammer head 83. This same movement of the rocker arm withdraws the lower finger 98 from between the lower button 72 of the shift lever and the lower hammer head 82.

Thus upon the next actuating stroke of the hammer 81, its upper head 83 engages against the upper finger 99 of the rocker arm and presses it against the upper button 73 of the shift lever. This rocks the shift lever 61 on its pivot pin 62 and thus pushes the stop member 55 into cover non-feeding position, as hereinbefore explained.

Movement of the rocker arm 94 when a can space occurs in the procession of cans on the table 11 is effected by cam action in time with the feeding of the covers B from their magazine 26. For this purpose the rocker arm 94 is formed with a tail piece 105 which extends outwardly adjacent and in contact with a tail piece 106 of a cam lever 107 carried on the pivot shaft 95. The two tail pieces 105, 106 are held together by a conventional yieldable connection which includes a bolt 108 extending through the pieces and a compression spring 109 exerting its force against the top of the tail piece 106. The inner end of the cam lever 107 carries a cam roller 111 which operates, along with the hammer cam roller 88, in the cam groove 89 of the barrel cam 91, the two rollers being in the same groove.

Hence the cam lever 107 is actuated once for every cover B about to be fed from the magazine 26 and in time with this feeding operation. The actuation of the cam lever 107, however, does not rock the rocker arm 94 for every cover B but merely compresses the spring 109 of the yieldable connection between the tail pieces 105, 106. The rocker arm 94 during these movements of the cam lever 107 is held stationary against movement by a feeler 114 (Fig. 1) which is disposed adjacent the path of travel of the procession of cans A advancing along the table 11. This feeler is carried on a pivot stud 115 secured in the table. A short link 116 connects the feeler with a bell crank 117 carried on a pivot stud 118 secured in the table. The crank in turn is connected by a long rod 119 to the rocker arm 94.

Through the resistance of the spring 109 of the yieldable connection between the rocker arm 94 and its actuating cam lever 107, the feeler 114 is pressed inwardly against the cans A moving along the table 11. It is thus the resistance of the cans that holds the feeler and the rocker arm connected therewith in a stationary position. The feeler is of sufficient length to permit two correctly spaced cans in the procession to engage it at the same time and this keeps the feeler under a steady or uniform resistance.

When a space occurs in the procession of cans passing the feeler 114, the resistance against the feeler is removed and thus the feeler moves into the space. The action of the yieldable connection between the rocker arm 94 and its actuating cam lever 107 is thus nullified and hence the rocker arm moves with its actuating cam lever upon its movement by the cam 91. It is this action that shifts the rocker arm 94 as hereinbefore explained.

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 can end feeding mechanism, the combination of a magazine for retaining a stack of can ends, a separator element adjacent said magazine for separating the lowermost can end in the stack from the others for removal from said magazine, a stop member disposed adjacent said separator element and movable into engagement with the lowermost can end for holding it against separation from the stack under predetermined conditions, a normally stationary shift element connected with said stop member and movable for shifting said stop member into operative and inoperative positions, a pivotal mounting for said shift element, a pair of actuating protuberances on said shift element and disposed on opposite sides of said pivotal mounting, a hammer member disposed adjacent said shift element in spaced relation thereto for movement toward and away from said protuberances, means for constantly operating said hammer member, a pivotally mounted rocker arm disposed adjacent said shift element and having movement normal to said shift element, and a pair of spaced fingers pivotally mounted on said rocker arm adjacent the protuberances on said shift element and interposable singly into the space between the adjacent protuberance and said hammer element upon movement of said rocker arm for effecting movement of said shift element in the proper direction by said hammer member.

2. In a can end feeding mechanism, the combination of a magazine for holding a stack of can ends, a separator element adjacent said magazine for separating the lowermost can end in the stack for removal from said magazine, a stop member disposed adjacent said separator element and movable from a cover separating position into engagement with the lowermost can end in the magazine for retaining it against separation from the stack, a shift element having spaced protuberances connected with said stop member for moving it into cover separating and cover retaining positions, magnet means for holding said shift element in shifted position, a hammer member disposed adjacent said shift element, means for constantly operating said hammer member, a rocker device located between said shift element and said hammer member and movable into position for engagement with one of the spaced protuberances of said shift element, and means for positioning said rocker device where said hammer member acting through the rocker device and through the adjacent protuberance of the shift element keeps said stop member in cover separating position, said rocker device positioning means changing the position of said rocker device to present the other protuberance of said shift element to the action of said hammer member so that said separator element is rendered ineffective by said stop member.

3. In a can end feeding mechanism, the combination of a conveyor for moving cans along a path of travel, a magazine for holding a stack of can ends, a separator element adjacent said magazine for separating the lowermost can end in the stack for removal from said magazine, a stop member disposed adjacent said separator element and movable from a cover separating position into engagement with the lowermost can end in the magazine for retaining it against

separation from the stack in the absence of a can on said conveyor, a shift element connected with said stop member for moving it into cover separating and cover retaining positions, a hammer member disposed adjacent said shift element, means for constantly operating said hammer member, a rocker device located between said shift element and said hammer member, a feeler engageable by a can moving along said path of travel and having connection with said rocker device, and means effective when said feeler is not engaged for moving said rocker device to a position where said hammer member acting through a part of the rocker device actuates the shift element to move said stop member into cover retaining position.

4. In a can end feeding mechanism, the combination of a conveyor for moving cans along a path of travel, a magazine for holding a stack of can ends, a separator element adjacent said magazine for separating the lowermost can end in the stack for removal from said magazine, a stop member disposed adjacent said separator element and movable from a cover separating position into engagement with the lowermost can end in the magazine for holding it against separation from the stack in the absence of a can on said conveyor, a shift element connected with said stop member for moving it into cover separating and cover retaining positions, a hammer member disposed adjacent said shift element, means for constantly operating said hammer member, a pivotally mounted rocker device located between said shift element and said hammer member, a cam lever pivotally mounted adjacent said rocker device, a yieldable connection between said rocker device and said cam lever, a feeler engageable by a can moving with said conveyor and having connection with said rocker device, and means cooperating with said hammer operating means for moving said cam lever to shift said rocker device when not held by said can feeler to effect movement of said stop member into cover retaining position, said cam lever movement being taken up by said yieldable connection when said can feeler and said rocker device is held by a can.

5. In a can end feeding mechanism, the combination of a magazine for holding a stack of can ends, a separator element adjacent said magazine for separating the lowermost can end in the stack for removal from said magazine, a stop member disposed adjacent said separator element and movable into engagement with the lowermost can end in the magazine for retaining it against separation, a hammer member disposed adjacent said stop member, means for constantly operating said hammer member, means interposed between said hammer member and said stop member to normally move the stop member to cover separating position, and means for actuating said interposed means to cause said hammer member to shift said stop member into cover retaining position.

6. In a can end feeding mechanism, the combination of a magazine for holding a stack of can ends, a separator element adjacent said magazine for separating the lowermost can end in the stack for removal from said magazine, a stop member disposed adjacent said separator element and movable from a cover separating position into engagement with the lowermost can end in the magazine for retaining it against separation from the stack, a shift element connected with said stop member for moving it into its cover separating and cover retaining positions, a hammer member disposed adjacent said shift element, means for constantly operating said hammer member, a rocker device located between said shift element and said hammer member, and means for moving said rocker device into position for said hammer member to act through the rocker device and the shift element to selectively move said stop member into cover separating position and into cover retaining position.

7. In a can end feeding mechanism, the combination of a magazine for holding a stack of can ends, a separator element adjacent said magazine for separating the lowermost can end in the stack for removal from said magazine, a stop member disposed adjacent said separator element and movable from a cover separating position into engagement with the lowermost can end in the magazine for retaining it against separation from the stack, a shift element connected with said stop member for moving it into its cover separating and cover retaining positions, a hammer member disposed adjacent said shift element, means for constantly operating said hammer member, a rocker device located between said shift element and said hammer member, means for moving said rocker device into position for said hammer member to selectively move said stop member into cover separating position and into cover retaining position, and magnet means disposed adjacent said shift element for engaging and holding said shift element in a shifted position.

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