

June 19, 1945.

A. L. KRONQUEST

2,378,855

CAN FEEDING MEANS

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FIG. 1.

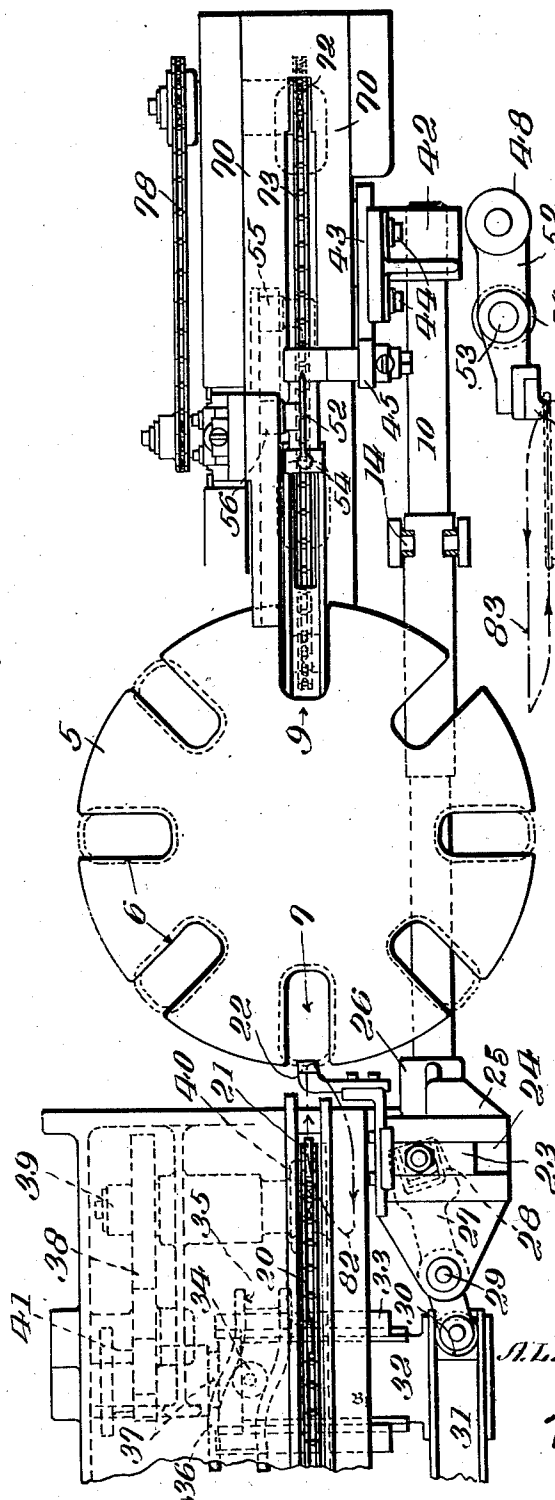
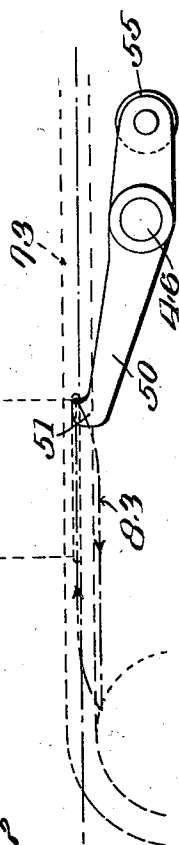


FIG. 6.



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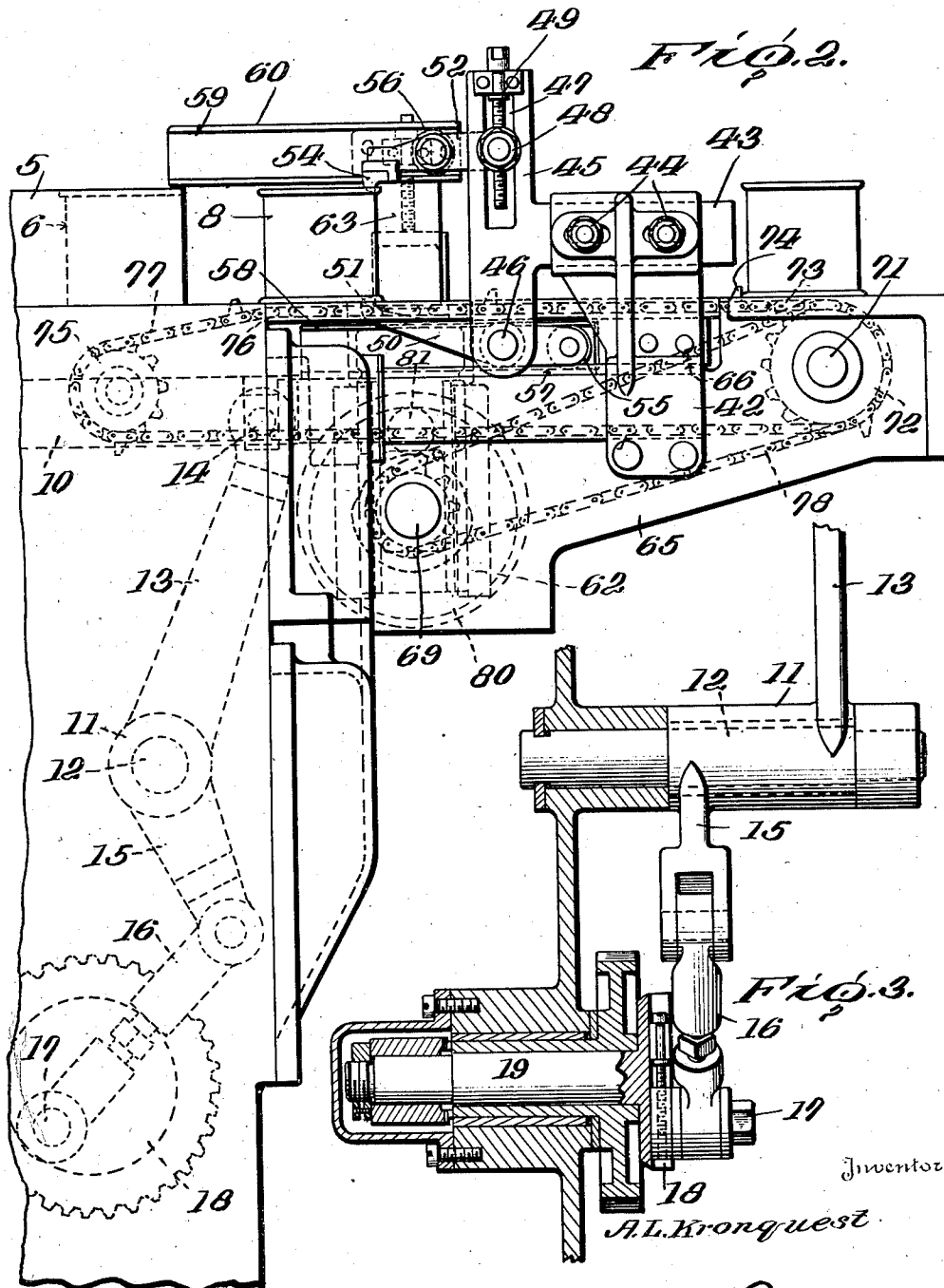
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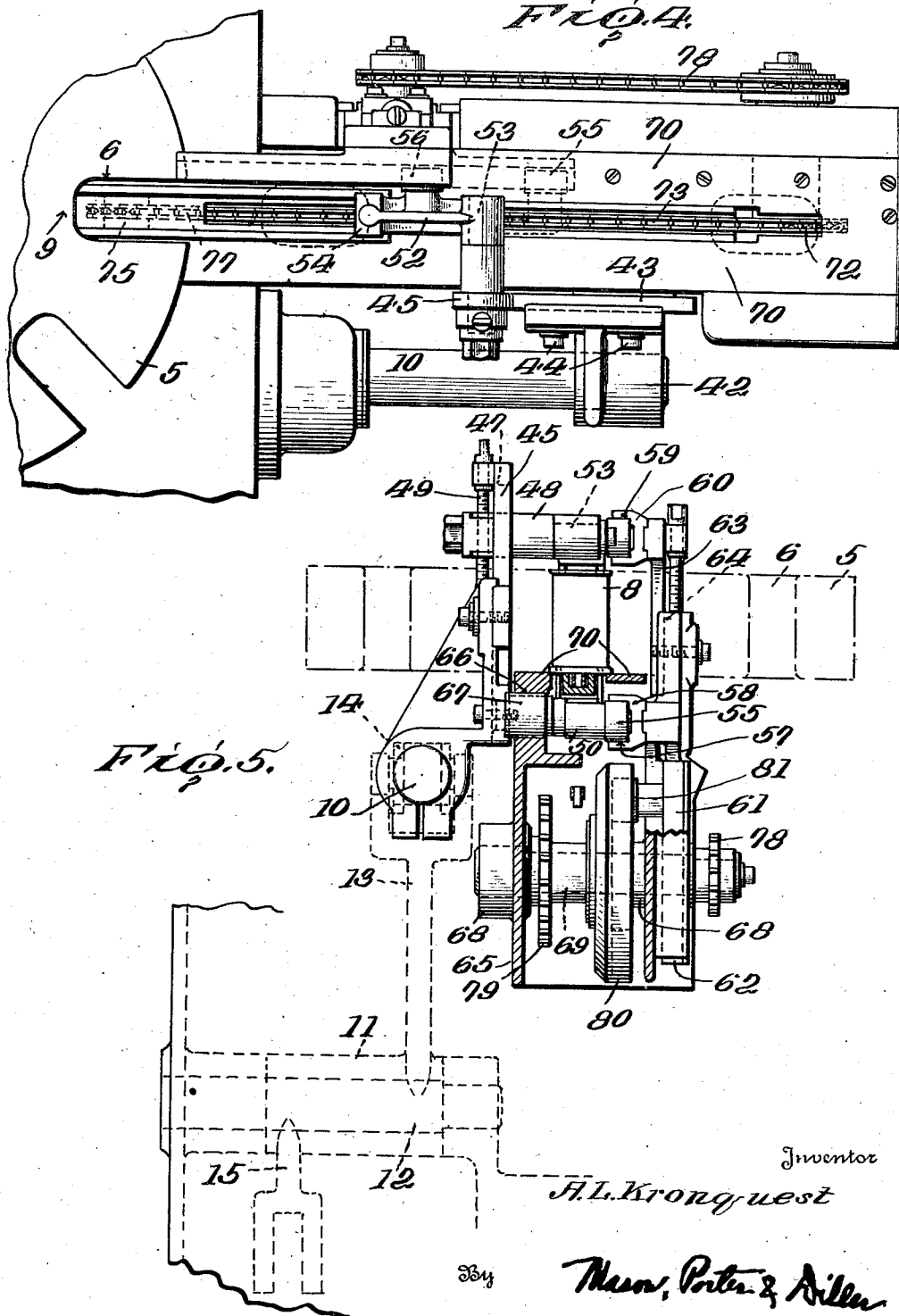
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UNITED STATES PATENT OFFICE

2,378,855

CAN FEEDING MEANS

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corporation of New York

Application June 24, 1944, Serial No. 542,020

15 Claims. (Cl. 198—20)

The invention relates generally to work feeders and primarily seeks to provide a novel means for feeding can bodies into and from the pockets in turret structures embodied in can body packing, closing or like machines.

An object of the invention is to provide a novel can feeding means including an element operable to feed a can into a pocket at one side of the turret and another element simultaneously effective to discharge a can from a pocket in the turret diametrically oppositely disposed with relation to the first mentioned pocket.

Another object of the invention is to provide a novel can feeding means of the character stated in which each said can infeeding and discharging element has a four-motion feed travel in accomplishing its can feeding or discharging function.

Another object of the invention is to provide a novel can feeding means of the character stated in which the four-motion feed movement of the element which feeds cans into the turret pockets is in a horizontal plane and the four-motion feed movement of the can discharging element is in the vertical plane.

Another object of the invention is to provide a novel can feeding means of the character stated in which the can discharging means includes a pair of upper and lower grippers which are moved into position above and below a can in a turret pocket at the discharging station, then downwardly into gripping contact with the upper and lower surfaces of the can and then away from the turret pocket to pull the can out of the same.

Another object of the invention is to provide a novel can feeding mechanism of the character stated in which the spaced relation of the upper and lower can gripping devices can be readily adjusted so as to adapt the discharging means for properly engaging cans of different heights.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a diagrammatic plan view illustrating a turret and the improved can feeding means operatively associated therewith.

Figure 2 is a fragmentary side elevation illustrating the can discharging means.

Figure 3 is a fragmentary vertical sectional view illustrating the means for reciprocating the

bar to which the can infeeding and the can discharging devices are operatively connected.

Figure 4 is a plan view illustrating the parts shown in Figure 2.

Figure 5 is an end elevation showing the parts illustrated in Figure 2, parts being broken away and in section.

Figure 6 is a fragmentary diagrammatic side elevation illustrating the path of movement followed by the gripper elements of the cam discharging means in moving toward the turret pocket, into engagement with the can to be discharged, and in a rectilinear path for withdrawing the can from the turret pocket.

In the example of embodiment of the invention herein disclosed, the improved feeding means is shown in combination with a turret 5 having a plurality of peripherally open, equidistantly spaced pockets 6, and which is indexed, station by station, to present the pockets serially at various stations in the machine in which the turret is incorporated, such as a cover feed station, a can feed station 7 at which filled cans 8 are fed into the turret pockets, and a discharge station 9 disposed diametrically opposite the station 7 and from which the cans are discharged.

The improved feeding mechanism includes a continuously and longitudinally reciprocated thrust bar 10 which is mounted in suitable frame bearings (not shown), and which is reciprocated by a bell crank lever 11 which is pivoted intermediate its ends in a frame bearing as at 12 and has one arm 13 pivot and slide block connected as at 14 to the bar, and its other arm link connected as at 16 to a crank pin 17 adjustably mounted on a disk 18 secured on a shaft 19 which is rotatable in a frame bearing and has rotation imparted thereto from any suitable moving part of the machine (not shown).

An endless conveyor chain 20 equipped with suitably spaced feeder lugs 21 serves to feed the cans 8 toward the turret, but this chain terminates short of said turret and the actual feeding of the cans into the turret pockets as they are serially presented at the station 7 is accomplished by a four-motion feed dog 22. See Figure 1.

The four-motion feed dog 22 is mounted on a slide 23 which is laterally reciprocable in guide ways 24 provided therefor in the head 25 which is secured as at 26 on one end of the reciprocable bar 10. The slide 23 is laterally reciprocated by a rocker arm 27 which is fork connected at 28 to said slide and is pivoted intermediate its ends as at 29 on the head 25. At its other end the rocker arm 27 is equipped with a roller

30 which engages in a longitudinal groove 31 in a slide 32 which is laterally slidable in a stationary guide way 33. The slide 32 is equipped with a roller 34 which engages in the actuator groove 35 in a rotary cam 36. The cam 36 is mounted on a shaft 37 which is spur gear coupled as at 38 with a shaft 39 on which the sprocket 40 supporting the terminal end of the feed chain 20 is secured, said shaft 37 being sprocket driven as at 41 from a suitable moving part of the machine (not shown).

At the other end of the reciprocating bar 10 is secured a head 42 having a longitudinal bar 43 adjustably secured thereon as at 44. The bar 43 is equipped with an upright extension piece 45 having a fixed pivot 46 at its lower end and a slot 47 at its upper end. A pivot bearing 48 is mounted in the slot 47 and is vertically adjustable therein through the medium of a captive adjuster screw 49.

A longitudinally disposed gripper member 50 is pivoted intermediate its ends on the fixed pivot 46 and includes a forked gripper finger portion 51 which is extended toward the turret in the manner clearly illustrated in Figures 2 and 6 of the drawings.

Another gripper member 52 is pivoted at one end as at 53 to the pivot bearing 48, and this gripper member also has a gripper finger portion 54 extended toward the turret.

A roller 55 projects laterally from the gripper member 50 at the end thereof remote from the turret, and the other gripper member 52 is equipped with a laterally projected roller 56 intermediate its ends in the manner clearly illustrated in Figures 2 and 4. It will be apparent by reference to these figures that the respective rollers 55 and 56 are disposed at opposite sides of the vertical center of the upright extension piece 45 on which the gripper members are pivotally mounted. The roller 55 engages in a longitudinal guide groove 57 in a lower bar 58, and the roller 56 engages in a similar guide groove 59 in an upper bar 60. The lower bar 58 is secured to a slide 61 which is vertically slidable in guides 62, and the upper bar 60 is secured to an upward extension 63 of the slide 61, said extension being vertically-adjustably secured on the slide 61 as at 64.

The slide guides 62 are secured to a frame 65 having a longitudinal groove 66 in which the lateral projection 67 extending from the head 42 is slide guided in the manner shown and which will be apparent by reference to Figures 2 and 5. The frame 65 also provides bearings 68 in which a cam shaft 69 is rotatably mounted. The frame also is equipped with cam supporting ways 70 and bearings for rotatably supporting a shaft 71. The shaft 71 is equipped with a sprocket 72 which supports one end of a feed chain 73 equipped with suitably spaced feeder lugs 74 and which passes over a sprocket 75 at its other end and over an intermediate or guide member 76 placed in the manner clearly illustrated in Figure 2 for providing an upwardly inclined chain portion 77 beneath the periphery of the turret 5. The shafts 69 and 71 are caused to rotate in unison by sprocket and chain connections 78.

A grooved cam 80 is mounted on the shaft 69, and a roller 81 projecting from the slide 61 engages in the groove of the cam with the result that the rotary motion of the cam is transmitted in the form of vertical reciprocation to the slide 61 and the bars 58 and 60 secured thereto.

It will be apparent that as the bar 10 is longitudinally reciprocated it will impart reciprocatory

movement to the head 25. While the head 25 is reciprocating the slide 23 is reciprocated laterally on said head in the manner hereinbefore described, and the combination of movements of the head 25 and the slide 23 serves to cause the feed dog 22 to follow a four-motion path of movement as indicated at 82 in Figure 1, said feed dog moving in a rectilinear path while moving the can into a turret pocket, then laterally and away from the turret, then along a rectilinear path of retraction, and then laterally and forwardly behind a can to thereafter again follow the rectilinear can feed travel.

It will also be apparent that each time the reciprocating bar 10 moves in a direction for retracting the four-motion feed dog 22 after a can infeeding engagement, it will move the upright extension piece 45 and the gripper members 50 and 52 pivotally mounted thereon toward the turret pocket presented at the discharge station 9. The operation of the rotary cam 80 is so timed that it will effect a lifting of the slide 61 and the bars 58 and 60 mounted thereon as the upright extension piece 45 starts its movement toward the turret pocket, and the upward movement of the bars 58 and 60 and the engagement of the grooves 57 and 59 thereof with the gripper member rollers 55 and 56 will cause the gripper finger portion 54 to move upwardly and the gripper finger portion 51 to move downwardly in the manner illustrated in Figure 6. The cam will then cause the slide 61 to retain its position until the gripper finger portions 54 and 51 are presented over and under a can 8 in the turret pocket presented at the discharge station, whereupon the cam groove again lowers the slide 61 and the gripper finger portions 54 and 51 are moved downwardly and upwardly so as to grip the can between them, after which they will move in a rectilinear path to withdraw the can from the turret pocket over the upwardly inclined chain portion 77 so as to position the can for being engaged by the next presented chain lug 74 and conveyed away over the feed ways 70. The four-motion path of travel of the respective finger portions 54 and 51 are indicated at 83 in Figure 6.

While one form of the invention has been shown for purposes of illustration, it is to be clearly understood that various changes in the details of construction and arrangement of parts may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. In apparatus of the character described, a rotary pocketed turret adapted to be moved station by station to present pockets serially at stations including a can receiving station and a can discharging station diametrically oppositely disposed with relation to said receiving station, and means for simultaneously feeding a can into a pocket presented at the receiving station and for discharging a can from a pocket presented at the discharging station, said means including a longitudinally reciprocated bar, a feed-in dog movable with the bar toward and from a pocket presented at the receiving station, gripper means movable with the bar toward and from a pocket presented at the discharging station, means for causing the dog to move out of line with the pocket while moving away from said pocket and for moving in line with the pocket while moving toward said pocket, and means for causing the gripper means to grip a can as the gripper means

reaches the position of the pocket at the discharging station and retain said grip as it is moved away from said pocket so as to withdraw the gripped can from said pocket.

2. In apparatus of the character described, a rotary pocketed turret adapted to be moved station by station to present pockets serially at stations including a can receiving station and a can discharging station diametrically oppositely disposed with relation to said receiving station, and means for simultaneously feeding a can into a pocket presented at the receiving station and for discharging a can from a pocket presented at the discharging station, said means including a longitudinally reciprocated bar, a feed-in dog movable with the bar toward and from a pocket presented at the receiving station, gripper means movable with the bar toward and from a pocket presented at the discharging station, means cooperating with said bar for causing the dog to partake of four-motion movement including a rectilinear path of movement toward the pocket and a second path away from said pocket and approximately parallel the first mentioned path, and means for causing the gripper means to grip a can as the gripper means reaches the position of the pocket at the discharging station and retain said grip as it is moved away from said pocket so as to withdraw the gripped can from said pocket.

3. Apparatus as defined in claim 2 in which the means cooperating with the bar comprises a head secured to the bar, a slide supporting the feed-in dog and slidable transversely with respect to the bar and on said head, a rocker arm pivoted intermediate its ends on said head and having one end connected to said slide and its other end equipped with a roller, a second transversely slidable slide having a longitudinal groove therein in which the roller engages, and rotary cam means for reciprocating said second slide.

4. In apparatus of the character described, a rotary pocketed turret adapted to be moved station by station to present pockets serially at stations including a can receiving station and a can discharging station diametrically oppositely disposed with relation to said receiving station, a feed-in dog, means for imparting four-motion feed movement in a horizontal plane to the feed dog for feeding cans into pockets serially presented at the receiving station, opposing gripper members at the discharging station, and means for imparting four-motion movement to said gripper members in a vertical plane to cause them to move into position above and below cans in pockets serially presented at the discharging station, then together to grip a can, then in a rectilinear path to withdraw the can from the pocket, then apart to release the can.

5. In apparatus of the character described, a rotary pocketed turret adapted to be moved station by station to present pockets serially at stations including a can receiving station and a can discharging station diametrically oppositely disposed with relation to said receiving station, a feed-in dog, means for imparting four-motion feed movement in a horizontal plane to the feed dog for feeding cans into pockets serially presented at the receiving station, opposing gripper members at the discharging station, and means for imparting four-motion movement to said gripper members in a vertical plane to cause them to move into position above and below cans in pockets serially presented at the discharging station, then together to grip a can, then in a rec-

tilinear path to withdraw the can from the pocket, then apart to release the can, and conveyor means onto which the cans are placed by said gripper members to be moved away.

6. In apparatus of the character described, a rotary pocketed turret adapted to be moved station by station to present pockets serially at stations including a can receiving station and a can discharging station diametrically oppositely disposed with relation to said receiving station, a feed-in dog, means for imparting four-motion feed movement in a horizontal plane to the feed dog for feeding cans into pockets serially presented at the receiving station, opposing gripper members at the discharging station, and means for imparting four-motion movement to said gripper members in a vertical plane to cause them to move into position above and below cans in pockets serially presented at the discharging station, then together to grip a can, then in a rectilinear path to withdraw the can from the pocket, then apart to release the can, and an endless chain onto which the cans are placed by said gripper members to be moved away and disposed to present a horizontal feed-away flight onto which the cans are placed and an upwardly inclined portion leading to said horizontal flight and disposed beneath the periphery of the turret.

7. In apparatus of the character described, a rotary pocketed turret adapted to be moved station by station to present peripherally open pockets serially at stations including a can discharging station, and means for discharging cans from pockets presented at said discharging station and including a head reciprocable toward and from the turret in timed relation to the movements of the turret, opposing gripper members movable relatively toward and from each other in a vertical plane and with the head toward and from said presented pocket, and means for causing the gripper members to grip a can simultaneously at top and bottom in said presented turret pocket as the gripper members reach said presented pocket and retain said grip as the gripper members are moved away from said presented pocket so as to withdraw said can therefrom and then release said grip before the gripper means is again moved toward the turret.

8. In apparatus of the character described, a rotary pocketed turret adapted to be moved station by station to present peripherally open pockets serially at stations including a can discharging station, and means for discharging cans from pockets presented at said discharging station and including a pair of upper and lower opposing gripper members and means for imparting four-motion movement in a vertical plane to each said gripper member to cause the gripper members to move into position top and bottom at opposite extremities of a can in a pocket at the discharging station, then together to simultaneously engage said can at the top and bottom, then in a path away from the pocket to withdraw the can therefrom.

9. In apparatus of the character described, a rotary pocketed turret adapted to be moved station by station to present peripherally open pockets serially at stations including a can discharging station, and means for discharging cans from pockets presented at said discharging station and including a pair of upper and lower opposing gripper members and means for imparting four-motion movement in a vertical plane to each said gripper member to cause the gripper members to move into position at opposite top and

bottom extremities of a can in a pocket at the discharging station, then together to simultaneously engage said can at top and bottom, then in a path away from the pocket to withdraw the can therefrom, and conveyor means onto which the cans are placed by said gripper members to be moved away.

10. In apparatus of the character described, a rotary pocketed turret adapted to be moved station by station to present peripherally open pockets serially at stations including a can discharging station, and means for discharging cans from pockets presented at said discharging station and including a pair of upper and lower opposing gripper members and means for imparting four-motion movement in a vertical plane to each said gripper member to cause the gripper members to move into position at opposite top and bottom extremities of a can in a pocket at the discharging station, then together to simultaneously engage said can at the top and bottom, then in a path away from the pocket to withdraw the can therefrom, and an endless chain onto which the cans are placed by said gripper members to be moved away and disposed to present a horizontal feed away flight onto which the cans are placed and an upwardly inclined portion leading to said horizontal flight and disposed beneath the periphery of the turret.

11. In apparatus of the character described, a rotary pocketed turret adapted to be moved station by station to present peripherally open pockets serially at stations including a can discharging station, and means for discharging cans from pockets presented at said discharging station and including a head reciprocable toward and from the turret in timed relation to movements of the turret, an upper gripper member pivoted at one end on said head and having a gripper finger portion directed toward the turret and having a roller projecting laterally therefrom intermedi-

ate its ends, a lower gripper member pivoted intermediate its ends on the head and having a gripper finger portion directed toward the turret and an end portion extended in the opposite direction and equipped with a laterally projecting roller, a slide having two longitudinal grooves therein directed in the direction of movement of the head and each receiving one said roller, and means for reciprocating the slide to cause each gripper finger portion to follow a four-motion path whereby they will first move into position above and below a can in a pocket at the discharging station, then together to engage the can, then in a path away from the pocket to withdraw the can therefrom.

12. Apparatus as defined in claim 11 in which there is included means for varying the spaced relation of the gripper members to adapt the apparatus for feeding cans of different heights.

13. Apparatus as defined in claim 11 in which there is included means for varying the spaced relation of the gripper members and also the spaced relation of the slide grooves in order to adapt the apparatus for feeding cans of different heights.

14. An apparatus as defined in claim 11 in which the slide reciprocating means comprises a rotary cam having an actuator groove and said slide has a roller projecting into said groove, said groove including a slide lifting portion a slide lowering portion and two intermediate concentric dwell portions.

15. An apparatus as defined in claim 11 in which there is included an endless chain onto which the cans are placed by said gripper members to be moved away and disposed to present a horizontal feed-away flight onto which the cans are placed and an upwardly inclined portion leading to said horizontal flight and disposed beneath the periphery of the turret.

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