July 24, 1934. J. H. MURCH 1,967,254

CAN END FEED MECHANISM

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Fig. 1

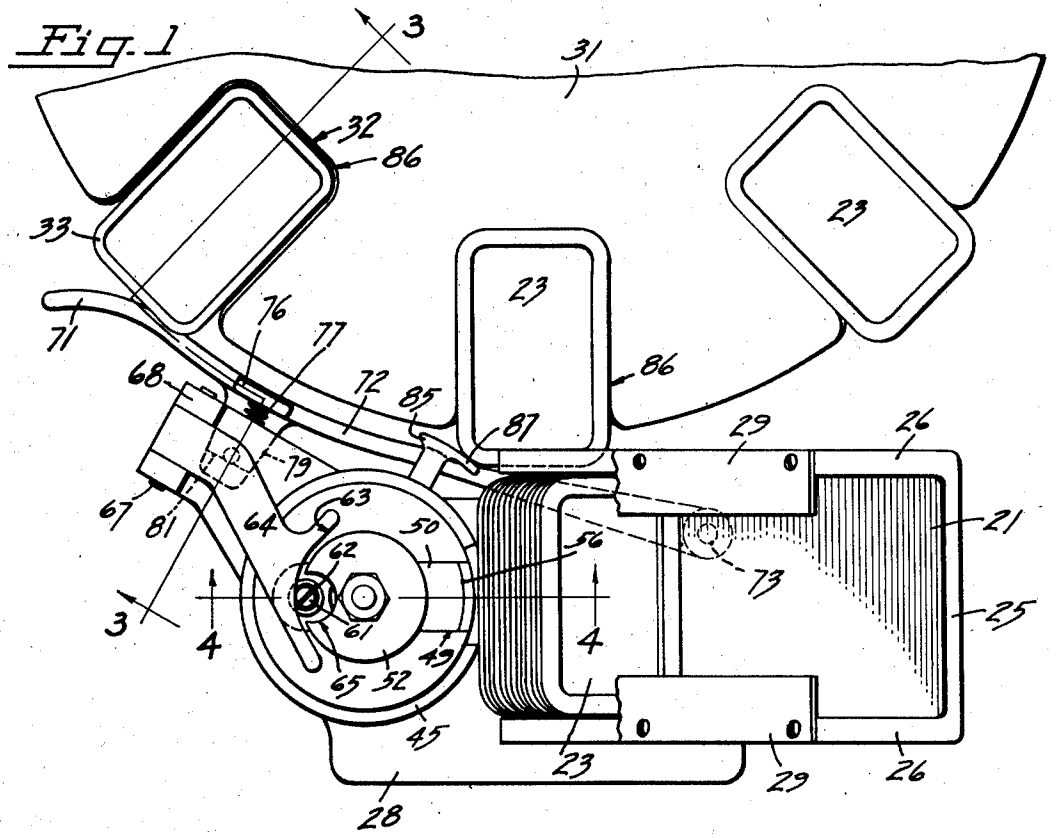
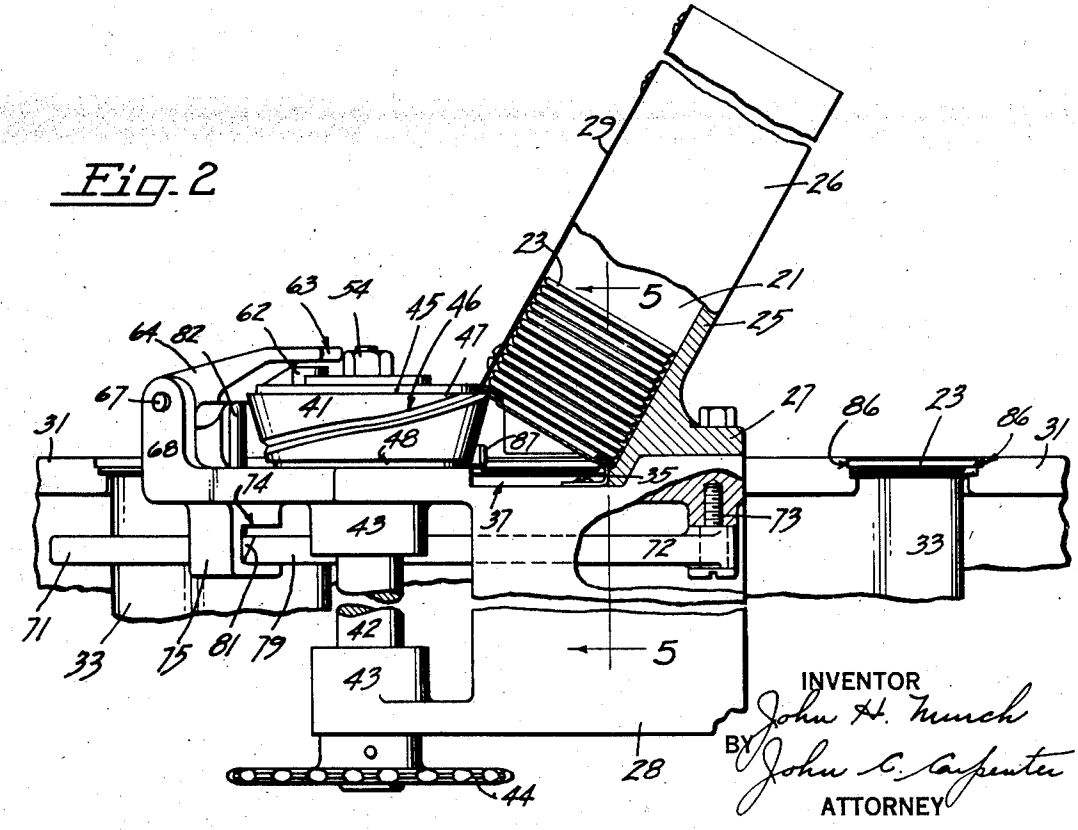


Fig. 2



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Fig. 3

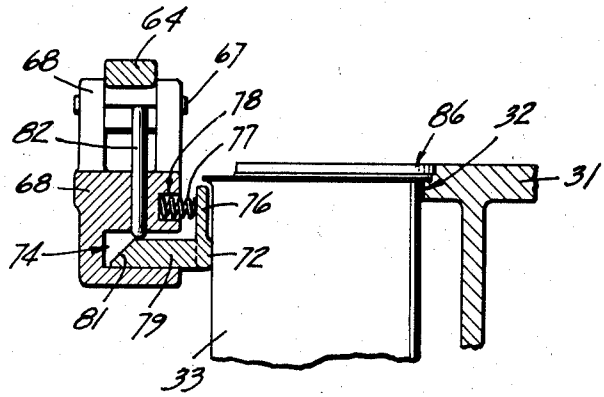


Fig. 5

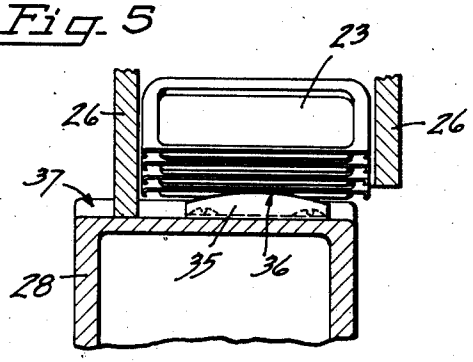


Fig. 4

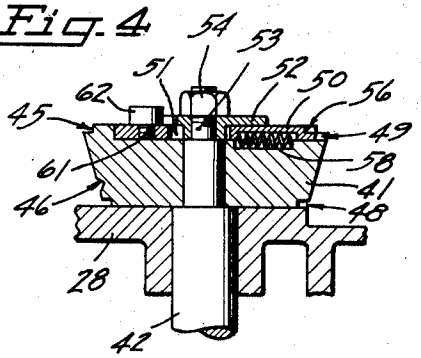
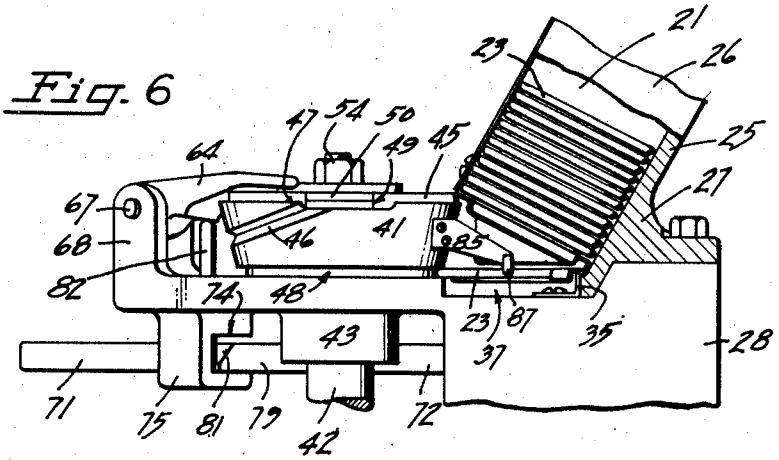


Fig. 6



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UNITED STATES PATENT OFFICE

1,967,254

CAN END FEED MECHANISM

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Application December 17, 1932, Serial No. 647,752

13 Claims. (Cl. 113—114)

The present invention relates to feeding mechanism and has for an important object the provision of an apparatus for separating and feeding can ends from a stack by separating the lowermost end along one side and pivoting it into cut-out position.

The present invention contemplates the use of an inclined magazine for supporting a stack of can ends which are individually and severally removed from the bottom of the stack by moving one side of each can end downwardly to bring it into horizontal position for engagement with an end feeding member.

The principal object of the present invention is the provision of an apparatus for separating and removing can ends individually from a magazine and at a high rate of speed by first separating them along one side and then pivoting each end while still in the magazine into a cut-out position for lateral removal and then removing.

An important object of the invention is the provision of a simple rotating separating device in an end feed mechanism for engaging one side of the can end and cutting it out of a stack of ends in a magazine when a can body is in proper position to receive it and then bringing the cut-out end to the can body.

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 fragmentary plan view of an apparatus embodying the present invention, parts being broken away;

Fig. 2 is a side elevation of the apparatus, parts being broken away;

Figs. 3 and 4 are transverse sectional details respectively taken substantially along the broken lines 3—3 and 4—4 in Fig. 1;

Fig. 5 is a transverse sectional detail taken substantially along the line 5—5 in Fig. 2; and

Fig. 6 is a view similar to Fig. 2 illustrating the feed mechanism parts in a different position, parts being broken away.

The apparatus illustrated in the drawings as a preferred embodiment of the invention comprises a magazine 21 (Figs. 1 and 2) for holding can ends 23. The magazine 21 is preferably formed with a rear wall 25 and side walls 26, the magazine being mounted in an inclined position and supported by a foot 27 which is bolted to a frame 28.

The can ends 23 are stacked into the magazine through its open upper end and rest against the back wall 25, a pair of retaining strips 29 being secured to the front edges of the side walls 26 to properly hold the stack in alignment.

The frame 28 may be a part of a can heading machine and is herein illustrated as being located adjacent to a can carrier disc 31 which is formed with spaced peripheral pockets 32, each pocket being adapted to receive a can body 33. The disc 31 may be suitably moved to bring the can 33 into different positions as the carrier 31 advances the pockets in a step by step movement.

The lower end of the magazine 21 is also open and the lowermost can cover in the stack rests against a stationary support 35 (Figs. 2, 5 and 6) which is formed as an angle plate mounted in the frame 28. The upper edge of the support plate is rounded at 36 (Fig. 5) and provides an edge support for the lower can end 23 within the stack. A recess 37 is formed in the frame 28 and the support 35 rests in this recess.

The opposite side of the stack of ends is supported by a movable support member 41 which in the embodiment illustrated comprises a frusto-conical part mounted on a vertical shaft 42 journaled in bearings 43 formed in the frame 28. This conical member 41 is continually rotated with the shaft 42 which is revolved in any suitable manner as by application of driving power to a sprocket 44 pinned to the lower end of the shaft.

The rotatable support member 41 is provided with a marginal portion or annular shelf 45 formed by cutting into its upper corner. During rotation of the member 41 (Figs. 2 and 4) the lowermost can end within the magazine rests upon that section of the shelf 45 which extends under the stack of ends, this section constantly changing as the conical member revolves.

The annular shelf 45 is not continuous but is interrupted for a short distance. The space intervening between the ends of the shelf merges into the upper end of a spiral groove 46 (Figs. 2 and 4) which is cut in the conical wall of the part 41.

This interrupted character of the shelf 45 is utilized either in the separation and feeding of a cover from the stack or in prevention of its removal. Such feeding is desirable only when there is a place for the cover when removed. This selection of a feeding condition or a non-feeding condition is controlled by the presence or absence of a can to receive the cover as will be hereinafter explained.

In the first condition the side of the lowermost can end which has been resting upon the shelf 45 drops into the upper end of the spiral groove 46 when the mouth of the spiral is presented. As the member 41 continues its rotation the groove pivots the can end on the rounded edge 36 of the support 35 and lowers the higher side of the can end to substantially the level of the other side. The mouth of the spiral groove 46 will not per-

mit passage of more than the single can end. A sharp point 47 (Figs. 2 and 6), formed by the junction of the end of the shelf 45 and the upper wall of the groove 46 now enters in between the lowermost end and the one next above and the ends in the remaining stack of ends are then again supported by the shelf. The spiral 46 declines, as it passes around the support 41 to about the level of the frame 28 and can carrier 31.

The conical wall of the member 41 maintains engagement of the edge of the can end during this pivotal movement, the slanting conical wall approximating the path of the down-swinging edge of the can end, the cover coming into horizontal position. The lower end of the groove 46 merges into a horizontal groove 48 formed as an under-cut section of the member 41 and it is into this horizontal groove that the end is deposited.

The second condition mentioned, wherein the can end is not moved from its position within the magazine is brought about by blocking the entrance to the groove 46 and continuing and completing the supporting action of the end for the entire cycle of rotation of the support member 41. To accomplish this a supplemental shelf section is supplied for completing the holding action of the shelf 45.

Such a blocking off of the entrance to the feeding groove prevents separation of the can end and the stack of ends remains intact and no feeding takes place. To insure that a can end is fed only when there is a can to receive it a no-can-no-end device is used which is actuated by a can in the pocket 32 of the carrier 31.

The member 41 is transversely slotted partially across its top surface at 49 (Figs. 1 and 4), one end of the slot communicating with the space between the ends of the annular shelf 45. A slide 50 is located within the slot. This slide is apertured at 51 where it encircles the hub of a washer 52 mounted on a reduced upper end 53 of the shaft 42. The washer 52 is held down against a shoulder of the shaft 42 by a lock nut 54.

The washer 52 provides a retaining member for keeping the slide 50 in sliding position within its groove. The outer edge of the slide 50 is curved with the same curvature as the outer periphery of the member 41 and its end is provided with a shoulder 56. This shoulder is adapted to register with the annular shoulder 45 of the member 41 and when the slide is in forward position fills in the space between the ends of the annular shelf 45 and covers the upper end of the groove 46. When so registered the lowermost can end 23 in the magazine is fully supported during the full rotation of the member 41.

A spring 58 (Fig. 4) is interposed between the slide 50 and the upper surface of the member 41 and the inner end of the spring engages the slide while its outer end engages a part of the support member 41. This spring normally holds the slide in the position illustrated in Fig. 4 wherein its shelf section 56 is retracted from registration with the shelf 45 of the member 41.

Unless the no-can-no-end device is actuated by a can the slide is moved forward each time its end passes adjacent the magazine. The slide on its rear end carries a stud 61 (Figs. 1 and 4) on which a roller 62 is rotatably mounted. Each time the forward end of the slide approaches the edge of the can end in the stack, the roller 62 is brought into engagement with a circular wall 63 formed in a pivoted latch 64, the wall extending within the path of travel of the roller.

The washer 52 is cut away at 65 for clearance around the roller and permits inward movement of the roller as it moves under the action of the wall 63. This forces the slide 50 into can end supporting position moving it against the action of its spring 58. In this manner the supporting of the high side of the lowermost can cover is uninterrupted.

The latch 64 is pivotally mounted at 67 (Figs. 1, 2 and 6) on a bracket 68 extending outwardly from the frame 28. The weight of the latch 64 normally holds it in its lowered position (shown in Fig. 6) where its circular wall 63 is within the path of travel of the roller 62. No separation of can ends takes place when this condition prevails as the wall acting upon the roller moves the slide and fills the groove entrance as previously described.

As the can carrier 31 moves a can 33 to bring it adjacent the magazine 21 the outer part of the can engages a rounded end 71 of an arm 72 pivotally mounted on a stud 73 threadedly engaging the frame 28. The outer end of the arm 72 is supported in a notch 74 formed in a boss 75 extending downwardly from the bracket 68. As the can rocks the arm on its pivot 73 a lug 76 formed on the arm compresses a spring 77 located in a pocket 78 formed in the bracket 68. This spring normally holds the outer end 71 of the arm in the path of travel of cans in the carrier 31.

The arm 72 adjacent the lug 76 is extended in a lateral projection 79 which terminates in an inclined edge 81. Movement of the arm forces this inclined edge under a vertically disposed pin 82 slidably mounted in the bracket 68. In innermost position (Fig. 3) the pin 82 rests upon the upper surface of the extension 79.

The upper end of the pin 82 engages the latch 64 and when moving up the pin rocks the latch on its pivot 67 and lifts its circular wall 63 above the plane of travel of the roller 62. The spring 58 of the slide 50 now holds the slide in its retracted position with its shelf 56 inwardly spaced from the periphery of the supporting member 41 and leaving open the entrance into the groove 46. The edge of the lowermost can end is free to pass into the groove 46 when it is presented and cutting out and separation of this end is thereupon effected.

A separated can end 23, when in horizontal position with one side still supported on the member 35 and the opposite side within the groove 48, is in position for lateral transfer into alignment with a can body 33 resting in the pocket 32 adjacent the bottom of the magazine. Such a transfer is effected by a feeding finger 85 secured to the conical wall of the member 41.

This finger 85 is carried around and around with the rotating member and is located just back of the bottom end of the groove 46. As soon as the can end leaves the groove 46 and comes into horizontal position within the groove 48 this finger 85 engages its outer edge and propels and sweeps it laterally into a pocket 86 (Figs. 1, 2 and 3) formed in the carrier disc 31. This removes the end from its supports within the magazine. Pocket 86 joins with the upper part of the pocket 32.

The outer wall of the finger 85 is extended at 87 and is curved as shown in Fig. 1 and this

wall sweeps along the outer part of the end 23 after it has been moved into its pocket 86. This prevents rebound of the end upon first coming into the pocket. End and can are now in axial alignment within the pocket and are moved away with the next movement of the carrier. Such a movement presents the next adjacent pocket 32 opposite to the magazine for the next feeding operation.

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 feed mechanism, the combination of a magazine for holding a stack of can ends, a stationary support at one side of said magazine and engaging the lowermost can end in said stack, a rotating support member located adjacent the opposite side of said magazine and also engaging the lowermost can end, means carried in said rotating support member for engaging the adjacent side of said lowermost end to cut out and separate it from said stack by pivoting it on the said stationary support while holding the other can ends in the stack, a frame on which the can end is released in substantially horizontal position, and means for sliding the can end on said frame.

2. In a can end feed mechanism, the combination of an inclined magazine for holding a stack of can ends, a stationary support at the lower side of said magazine and engaging the lowermost can end in said stack, a rotating support member located adjacent the magazine and at the higher side opposite to said stationary support and also engaging the higher side of the lowermost can end, means carried in said rotating support member for engaging the higher side of said lowermost end to separate that side of the end from the stack by pivoting the end on said stationary support, and a transfer device for moving said separated end laterally from said magazine.

3. In a can end feed mechanism, the combination of a magazine for holding a stack of can ends in an inclined position, a stationary support at the low side of said magazine and engaging the lower edge of the lowermost can end in said stack, a rotating frusto-conical support member located adjacent the high side of said magazine and having a shelf formed on its upper surface for also engaging the higher edge of the lowermost can end and having an inclined spiral groove formed on its conical face and connecting with said shelf, means for passing the shelf engaged side of said lowermost can end into said groove and pivoting said end on said stationary support to move it into a horizontal separated position relative to said stack, and means removable by a can body obstructing a can end from engaging in said groove.

4. In a can end feed mechanism, the combination of a magazine for holding a stack of can ends in an inclined position, a stationary support at the low side of said magazine and engaging the lowermost can end in said stack, a rotating frusto-conical support member located adjacent the high side of said magazine and having a shelf formed on its upper surface for also engaging the lowermost can end and having an inclined spiral groove formed on its conical face and connecting with said shelf, means for passing the shelf engaged side of said lowermost can end into said groove and pivoting said end on said stationary support to move it into a horizontal separated position relative to said stack, and a transfer finger carried on said rotating support member for moving said cut-out can end from its supports and from said magazine.

5. In a can end feed mechanism, the combination of a can carrier for moving a can into position to receive a can end, a magazine for holding a stack of can ends, a stationary support at one side of said magazine on which the stack is carried, a rotating support member located adjacent the opposite side of said magazine for supporting that side of the stack, means carried in said rotating support member for cutting out the lowermost can end along one side and while pivoting it on said stationary support moving it into separated position, a frame on which the separated can end is held in horizontal position, and a transfer device for moving said cut-out end laterally and into axial alignment with a positioned can in said can carrier.

6. In a can end feed mechanism, the combination of a can carrier for moving a can into position to receive a can end, a magazine for holding a stack of can ends and having a stationary support at the bottom of the magazine and on one side, a rotating support member located adjacent the opposite side and engaging the lowermost can end, means carried in said rotating support member for cutting out the lowermost can end by pivoting it on said magazine support, a transfer device for moving said cut-out end laterally from the magazine and in axial alignment with a positioned can in said can carrier, and a no-can-no-end device for normally preventing said cut-out means in said rotary support member from engaging and separating the lowermost can end in said stack, a can when properly positioned in said carrier actuating said no-can-no-end device to permit such end separating and feeding.

7. In a can end feed mechanism, the combination of a can carrier for moving a can into position to receive a can end, a magazine for holding a stack of can ends, a rotatable, spirally grooved member for engaging a can end for cutting it out of the stack held in said magazine, and means governed by the absence of a can in said carrier for preventing entrance of a can end into said groove when no can is presented to receive said end.

8. In a can end feed mechanism, the combination of a can carrier for moving a can into position to receive a can end, a magazine for holding a stack of can ends, a rotatable spirally grooved member for engaging a can end for cutting it out of the stack held in said magazine, means carried by said rotatable member for closing the entrance into its spiral groove, and means governed by the presence of a can in said carrier for withdrawing said groove closing means from closing position.

9. In a can end feed mechanism, in combination, a can carrier, an inclined magazine having its lower bottom edge substantially on a level with the top of said carrier, means for lowering

the other and higher edge of the bottommost can end in said stack to said level, and means for propelling said can end on to said carrier.

10. In a can end feed mechanism, in combination, a can carrier, an inclined magazine having its lower bottom edge substantially on a level with the top of said carrier, means for lowering the other and higher edge of the bottommost can end in said stack to said level, and means for propelling said can end on to said carrier, said lowering means consisting of a rotary support having its top edge arranged under the higher edge of the bottommost can end and having peripheral can end engaging means declining from its top edge to said level.

11. In a can end feed mechanism, in combination, a can carrier, an inclined magazine having its lower bottom edge substantially on a level with the top of said carrier, means for lowering the other and higher edge of the bottommost can end in said stack to said level, means for propelling said can end on to said carrier, said lowering means consisting of a rotary support having its top edge arranged under the higher edge of the bottommost can end and having peripheral can end engaging means declining from its top edge to said level, means to obstruct the engagement of said can end by said engaging means, and means operated by a can body to remove said obstructing means.

12. In a machine for assembling can ends and can bodies, a magazine for stacked can ends, a support for the stack of can ends at one side of the bottom thereof, and a rotary support for said stack arranged at the other side of said bottom, said rotary support having a marginal portion which is continuous for a part of the circumference of said support and having a recess into which an edge of the bottommost can end may drop, a point on said rotary support at one side of said recess adapted to enter between a dropped can end and the next bottommost can end and thence support the stack, and a peripheral groove leading from said recess downward and around the support, so as to conduct downward and release the said edge of the can end engaged thereby.

13. In a machine for assembling can ends and can bodies, a magazine for stacked can ends, a support for the stack of can ends at one side of the bottom thereof, and a rotary support for said stack arranged at the other side of said bottom, said rotary support having a marginal portion which is continuous for a part of the circumference of said support and having a recess into which an edge of the bottommost can end may drop, a point on said rotary support at one side of said recess adapted to enter between a dropped can end and the next bottommost can end and thence support the stack, and a peripheral groove leading from said recess downward and around the support, so as to conduct downward and release the said edge of the can end engaged thereby, a slide adapted to obstruct the entrance of the edge of a can end into said recess, and means operated by a can body for removing said slide from obstructing position.

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