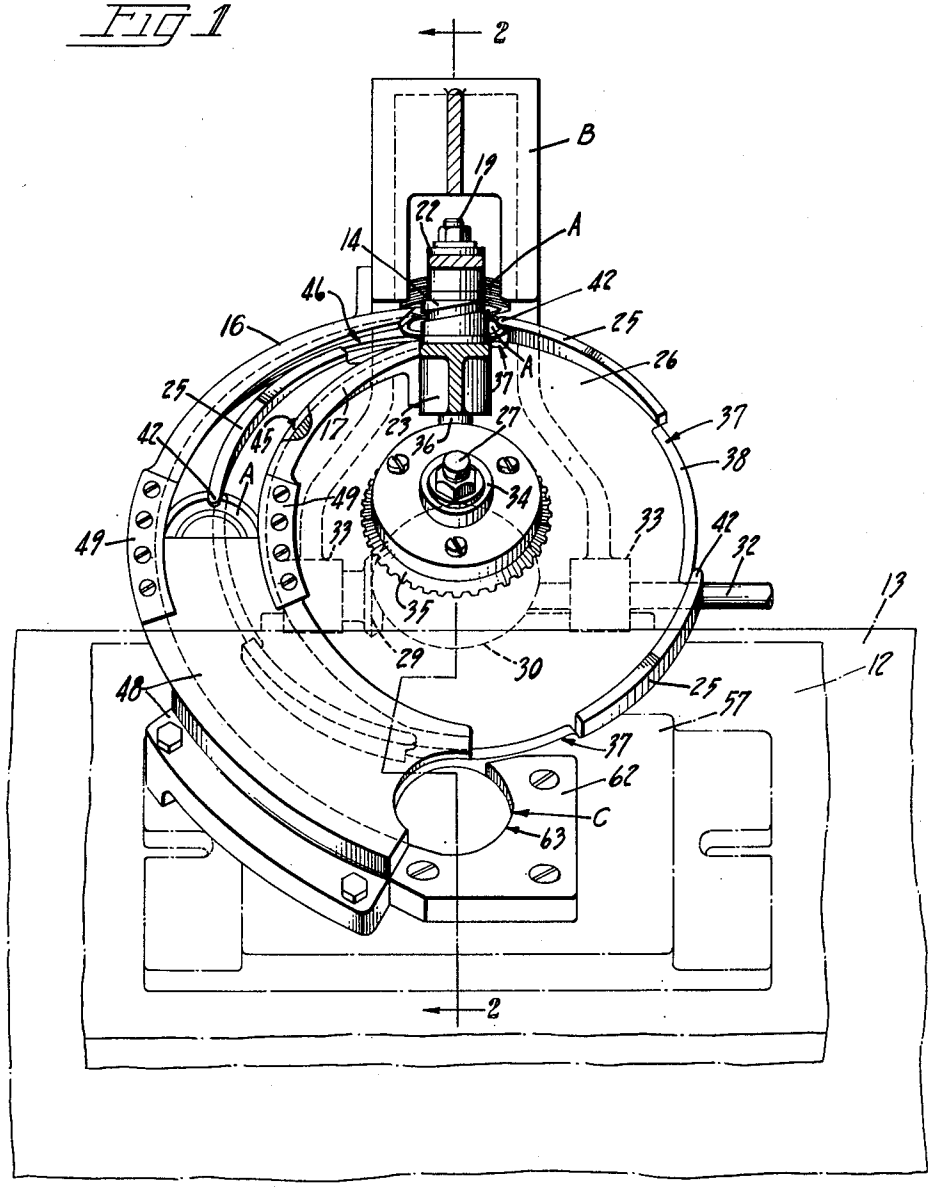
Jan. 30, 1951 W. PECHY 2,539,467

FEEDING MECHANISM FOR CAN ENDS

Filed Dec. 5, 1946 3 Sheets-Sheet 1

Fig 1



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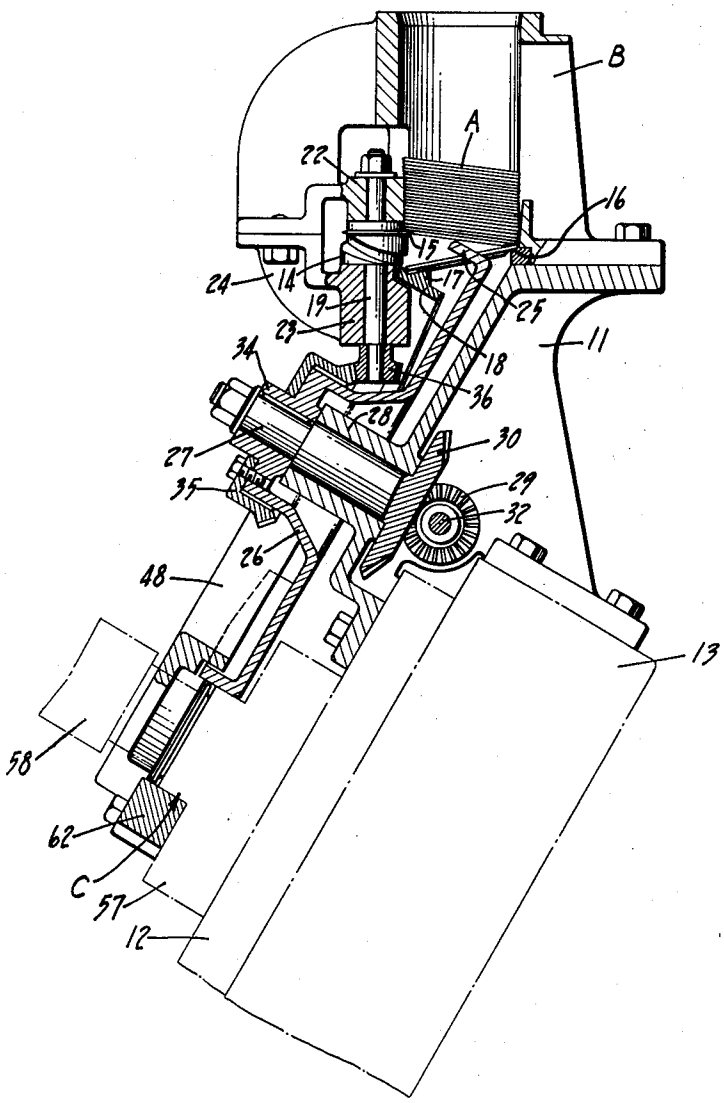
Filed Dec. 5, 1946 3 Sheets-Sheet 2

FIG 2



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Filed Dec. 5, 1946 3 Sheets-Sheet 3

Fig 3

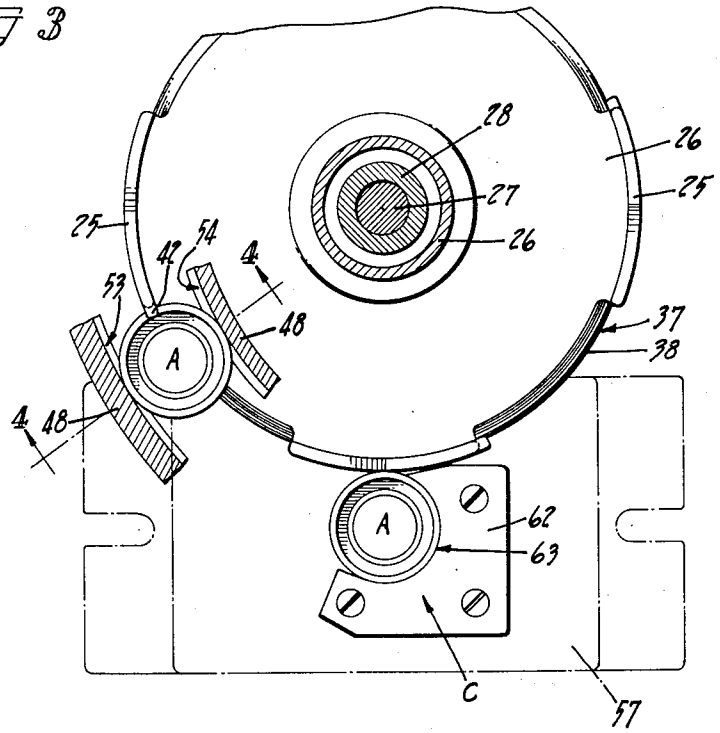


Fig 4

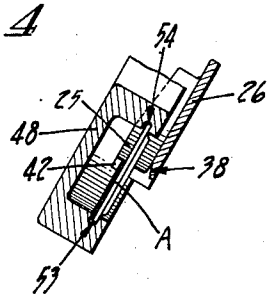
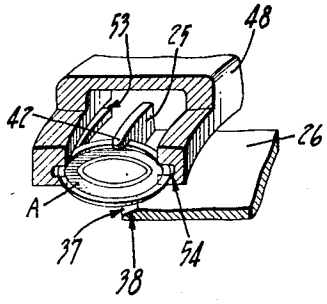


Fig 5



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UNITED STATES PATENT OFFICE

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FEEDING MECHANISM FOR CAN ENDS

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Application December 5, 1946, Serial No. 714,249

4 Claims. (Cl. 113—114)

1

This invention relates to an improved feeding mechanism for blanks, can ends and the like and has particular reference to a mechanism for receiving blanks or can ends located in one plane and for transposing them while conveying them into a predetermined position in another plane for delivery to a blank or can end treating mechanism which is disposed at an angular position relative to the feeding mechanism.

An object of the invention is the provision of a feeding mechanism having a rotatable feeding element for transferring articles such as can ends from a receiving station to a delivery station, wherein the can ends while in the feeding element are rocked or pivoted or transposed relative to the feeding element to bring them into a desired position at the delivery station at a high rate of speed.

Another object is the provision of such a feeding mechanism wherein the can ends while being transposed to a different plane in the feeding element are also shifted laterally away from the center of rotation of the element for bringing the periphery of the can ends into engagement with the outer periphery of the element to facilitate the wiping and locking of the can ends into a desired position at the delivery station.

Another object is the provision of such a feeding mechanism wherein the feeding element is a rotatable turret having pockets for receiving the can ends in a predetermined position and for pivotally retaining the can ends while they are transposed or rocked relative to the turret into a plane parallel with the turret to facilitate movement of the can ends for disposition in a desired plane into another mechanism for further treatment.

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 front elevation of a feeding mechanism embodying the present invention with parts broken away and parts in section;

Fig. 2 is a sectional view of the mechanism taken substantially along the line 2—2 in Fig. 1;

Fig. 3 is a face view showing a rotatable turrent for feeding can ends into a can end treating mechanism, such as a die mechanism;

Fig. 4 is a sectional detail taken substantially along the line 4—4 in Fig. 3; and

2

Fig. 5 is a perspective view showing the feeding of a can end through the tunnel section of the machine.

As an exemplary embodiment of the present invention the drawings disclose a feeding mechanism for can ends, blanks, rings and the like A which preferably are fed from a magazine or supply source B to a can end treating unit such as a die press C where a die operation is performed on the can end. The can ends A preferably are received in the feeding mechanism in a substantially horizontal position and are transposed and rocked or turned while being transferred along a circular path of travel for delivery at the station C. The can ends then are in an angular plane for reception into the die mechanism. Such a mechanism is disposed in a predetermined angular position to facilitate certain die operations which are best performed when the dies are located in angular position relative to the horizontal.

A supply of can ends A are stacked in the magazine B (Figs. 1 and 2) and are preferably disposed at a slight angle so that the lowermost can end may be readily separated from the remainder. Magazine B is mounted on a frame 11 which is secured to a bolster plate 12 mounted on a press frame 13 which constitutes the main frame of the machine. The lowermost can end A is separated from the others by means of a rotary screw separator 14 of a conventional form.

The separator 14 is formed with a spiral thread 15 which engages the supply of ends in the magazine and permits the lowermost can end to be separated and lowered into a substantially horizontal plane. In such position it rests on one end of a track or guide rail 16 extending into the magazine B and on one end of a track or guide rail 17. The separator 14 is mounted on a vertical shaft 19 journaled in an upper bearing 22 of the magazine B and in a lower bearing 23 formed on a bracket 24 secured to the magazine B. Shaft 19 is driven from its lower end by the feed mechanism in a manner to be described hereinafter.

Each separated can end A resting on the ends of the tracks or guide rails 16 and 17 (Fig. 2) is engaged by a feed finger 25 formed as a laterally extending wall element on the periphery of a continuously rotating feeding element or turret 26. There are four such feed fingers equally spaced on the rotatable turret 26 (Figs. 1 and 2).

The turret 26 is mounted on a shaft 27 having an axis parallel to the path of travel of the can ends through the die mechanism (Fig. 2). Shaft

27 is journaled in a bearing 28 formed in the frame 11. The shaft 27 is rotated at its lower end by a gear 29 which meshes with and drives gear teeth 30 formed integral with the shaft 27. The gear 29 is mounted on a drive shaft 32 journaled in suitable bearings 33 on the frame 11 and may be driven in any suitable manner (see Figs. 1 and 2).

The turret 26 is formed with a centrally disposed hub 34 which is surrounded by a gear 35 and which is secured to the turret 26. The gear 35 engages with and drives a pinion 36 mounted on the lower end of the shaft 19. This drives the cover feed or separator in time with the turret feeding mechanism. The turret 26 preferably is operated in time with the separation of the lowermost can end so that the latter is received in one of four turret pockets 37 which are located intermediate the feed fingers 25. Turret pocket 37 is tapered outwardly towards the outer periphery as at 38 (Figs. 4 and 5) so that a can end may be received at an angle to and intersecting the plane of the path of the turret finger and rocked or pivoted into this predetermined plane while still within the pocket.

The forward end of each turret finger 25 is formed with a finger extension 42 which moves over the edge of the lowermost can end A in the magazine B, as the advancing finger 25 engages the end. This insures that the can end A (Figs. 1 and 2) is held in the turret pocket 37 preparatory to being fed along its circular path of travel. As the turret 26 continues its rotation in a counterclockwise direction, as viewed in Fig. 1, finger 25 moves the engaged can end from beneath the supply magazine. It sweeps the end over the tracks 16, 17 and along the circular path of travel of the finger 25 and at the same time the end is rocked from its receiving plane into its delivery plane.

Provision is made for keeping the can ends under control at all times while they are being advanced thus insuring smooth and accurate delivery. For this purpose the guide rails 16, 17 are formed respectively with spiral grooves 45, 46 (Fig. 1) which start on opposite sides of the predetermined plane of the path of the finger 25. These grooves descend and ascend, respectively, in spiral formations, into this predetermined plane, and guide the can ends from the angular plane-intersecting position, in which each is received by the grooves, substantially into coincidence with the predetermined plane.

It is while travelling along the grooves 45, 46 that the can ends are rocked in their turret pockets 37 from the angular receiving position (Fig. 2) into a position shown in Fig. 4 where the can end is substantially parallel with the plane of the turret 26. Upon reaching the lower end of the guide rails 16, 17 the can ends enter into terminal portions of these rails in the form of a tunnel or housing 48 (see also Figs. 1 and 5). The tunnel is secured to the bolster plate 12. The tunnel 48 shifts the can ends laterally or radially outward away from the axis of the rotating turret.

The guide rails 16, 17 are supported by the tunnel 48, the lower ends being secured by plates 49. The upper ends of the guide rails are secured to the magazine B. The tunnel 48 is formed with grooves 53, 54 (Fig. 5), which together with the grooves 45, 46 provide uninterrupted tracks along which the can ends A travel. Fig. 1 of the drawings illustrates how the can

end A is shifted or diverted outwardly of the turret pocket 37 so that upon reaching the lower portion of its path of travel, the can end is clear of the pocket 37. The can end is delivered in a registered position into a die mechanism 57 located at station C. It is to be understood that this die mechanism is merely one example of a variety of can end treating mechanisms which may be associated with the turret feed.

As the turret 26 continues to rotate the outer peripheral wall of the finger 25 sweeps or wipes the outer marginal edge of the can end A into a registered or aligned position in a pocket at station C (Figs. 2 and 3). The outer periphery of the turret finger 25 locks the can end A in position and holds it in place while a punch 58 operated in time with the feeding mechanism moves downward and grips the can end in the die mechanism preparatory to a work performing operation. The can end A is centralized at station C by means of a plate 62 having a circular outline pocket 63. The plate 62 is secured to the die mechanism 57.

Following the die performing operation at station C, the can end A is ejected in any suitable manner from the die mechanism 57 for discharge to a convenient plant of deposit. The next succeeding can end A thereupon moves into position at station C and the work operations are repeated.

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. A feeding mechanism for can ends and the like, comprising a feed finger movable along a circular path in a predetermined plane; a pair of arcuate, spaced guide members, one of said guide members being spaced radially inwardly relative to the circular path of said feed finger and gradually curving outwardly toward and terminating adjacent the circular path of said feed finger, the other of said guide members being spaced outwardly relative to the circular path of said feed finger, each of said guide members having a spiral guide groove formed therein, the spiral formation of one groove ascending and the other descending relative to said predetermined plane, said grooves terminating substantially in said predetermined plane; a magazine for supporting a stack of can ends above the path of said feed finger; means for separating a can end from the bottom of said magazine and placing it at an angle to and intersecting said predetermined plane and with opposite lateral edges of the can end in alignment with said guide grooves; and means for advancing said finger along said path to engage and move said can end from said magazine and along said path with lateral portions of the can end in engagement with each of said guide grooves, whereby said can end is rotated from its plane-intersecting position into a position substantially coincident with said predetermined plane and tangent to the path of said feed finger.

2. A feeding mechanism for can ends and the like, comprising a feed finger movable along a circular path in a predetermined plane; a pair

of arcuate, spaced guide members, one of said guide members being spaced radially inwardly and the other radially outwardly relative to the circular path of said feed finger, each of said guide members having a spiral guide groove formed therein, the spiral formation of one groove ascending and the other descending relative to said predetermined plane, both grooves extending substantially into and along said predetermined plane; means for feeding a can end into said path of the feed finger and for placing it at an angle to and intersecting said predetermined plane with opposite lateral edges of the can end in alignment with said guide grooves; terminal portions of said guide members and grooves curved radially outwardly for guiding the can end along said predetermined plane and radially outwardly from said path of the feed finger; and means for advancing said finger along said circular path to engage and move said can end along the path with lateral portions of the can end in engagement with each of said guide grooves, whereby said can end is guided under close control from its plane-intersecting position into a position substantially coincident with said predetermined plane and tangent to the path of said feed finger.

3. A feeding mechanism for can ends and the like, comprising a feed finger; means for moving said feed finger along a circular path in a predetermined plane; a magazine for supporting a stack of can ends above the path of said feed finger; means for supporting a can end from the bottom of said magazine and placing it at an angle to and intersecting the plane of the path of said finger; a can end centralizing plate disposed adjacent the path of said finger, said plate having a pocket lying in said predetermined plane and located in tangential relation to said path, said pocket having a wall substantially conforming in shape to a portion of the perimeter of a can end; a pair of arcuate, spaced guide members disposed radially inwardly and outwardly of the path of said finger, each of said guide members having a spiral guide groove formed therein, the spiral formation of one groove ascending and the other descending relative to said predetermined plane, both grooves extending substantially into and along said predetermined plane, said guide members and grooves leading from said magazine and terminating adjacent the pocket said centralizing plate for guiding a can end propelled by said finger from said magazine into said pocket, and an arcuate peripheral wall section formed on said finger in tangential relation to the pocket of said centralizing plate and being engageable with the outer edge of said can end received in said pocket for locking the can end in said pocket.

4. A feeding mechanism for can ends and the like, comprising a feed finger; means for moving said feed finger along a circular path in a predetermined plane; means for feeding a can end into said path of the feed finger and for placing it at an angle to and intersecting said predetermined plane for advancement by said finger; a can end centralizing plate disposed adjacent the path of said finger, said plate having a pocket lying in said predetermined plane and located tangentially to the circular path of said finger; a pair of arcuate guide members each spaced radially from the other and from opposite sides of the path of said finger, each of said guide members having a spiral guide groove formed therein for peripherally engaging and guiding the can end during advancement, the spiral formations of said guide grooves starting on opposite sides of said predetermined plane and terminating substantially within said predetermined plane for rotating the can end from its plane-intersecting position substantially into coincidence with said predetermined plane during advancement; terminal portions of said guide members and grooves curved radially outwardly relative to the path of said finger and substantially in said predetermined plane for guiding said rotated can end into said centralizing plate pocket; and an arcuate peripheral wall section formed on said finger in tangential relation to the pocket of said centralizing plate and engageable with the outer edge of the can end for locking the can end in said pocket while said wall section sweeps by the pocket.

WILLIAM PECHY.

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