June 12, 1934. F. KRUEGER 1,962,645

CAN HEAD FEEDER FOR CAN BODY MAKING MACHINES

Filed April 26, 1932 4 Sheets-Sheet 1

Fig. 1.

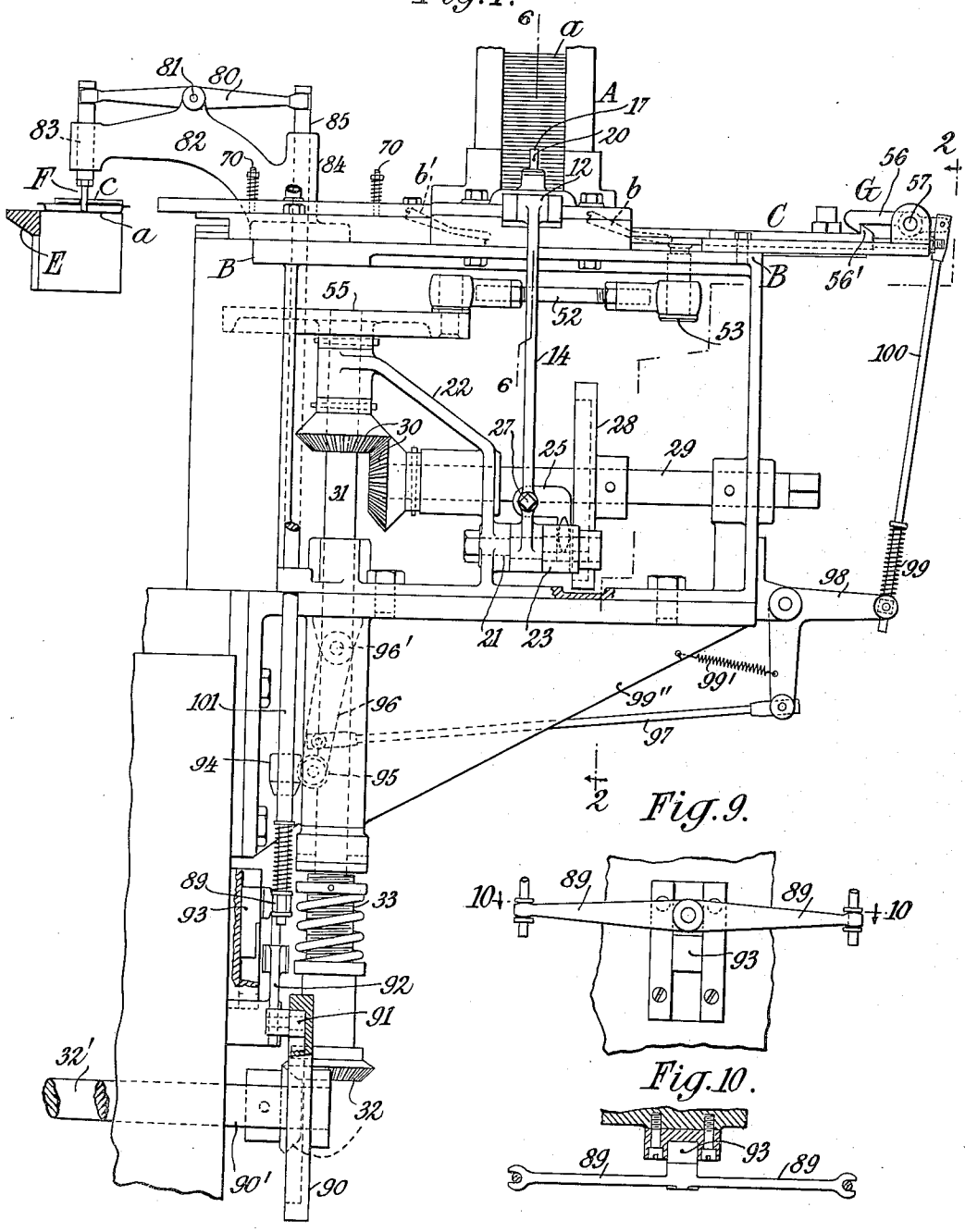


Fig. 9.

Fig. 10.

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Fig.2.

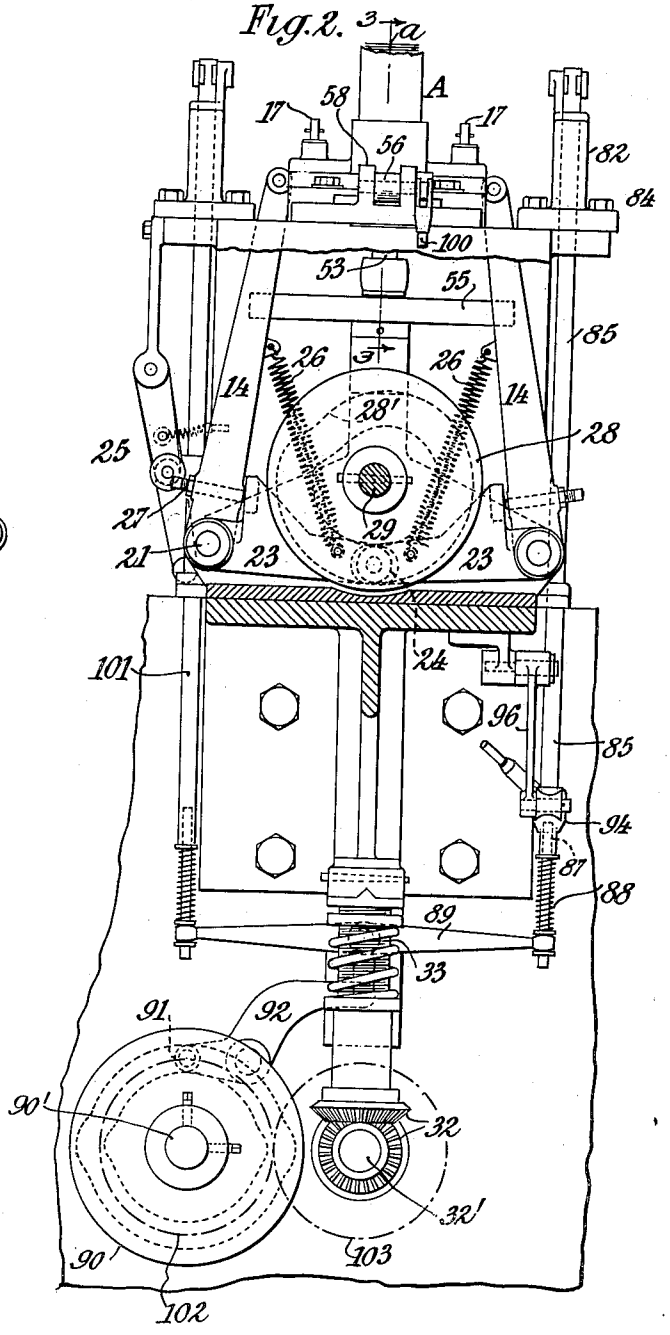


Fig.2a

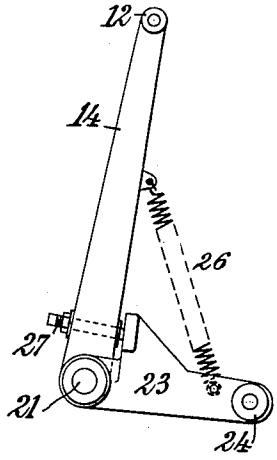
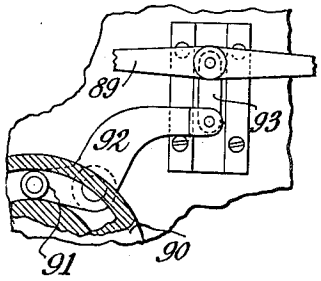


Fig.8.



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CAN HEAD FEEDER FOR CAN BODY MAKING MACHINES

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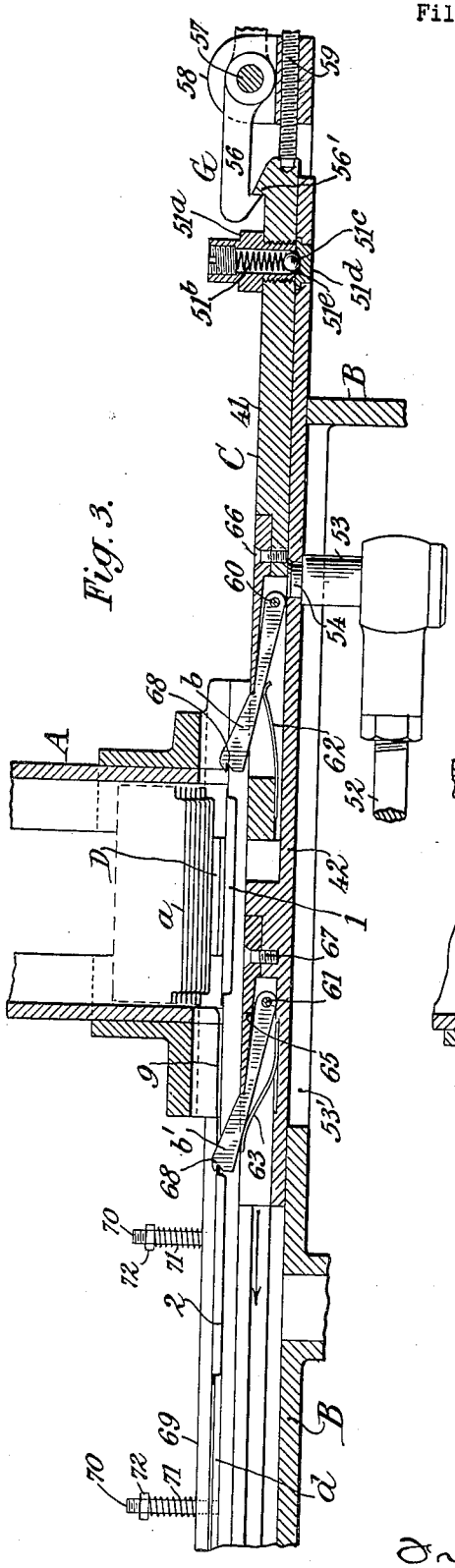


Fig. 3.

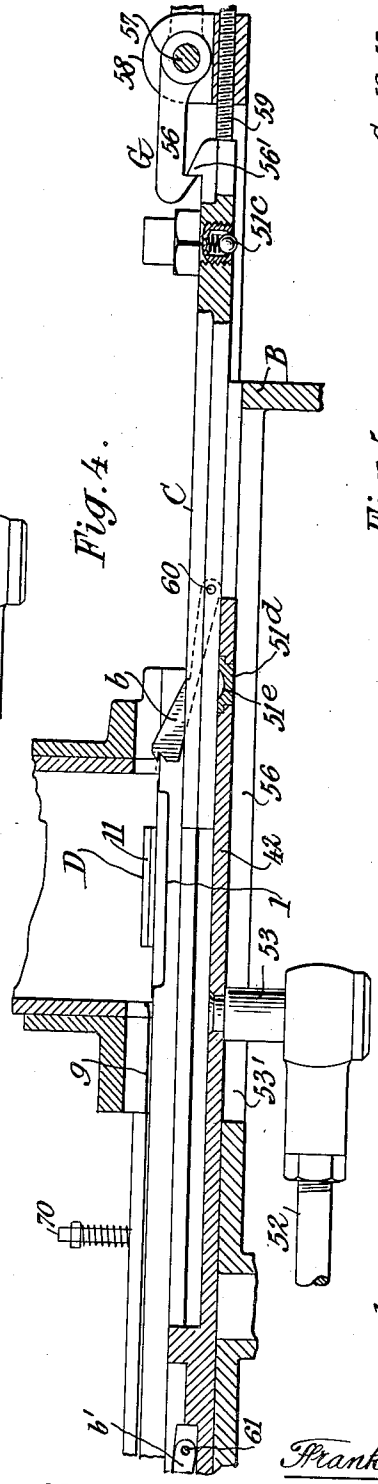


Fig. 4.

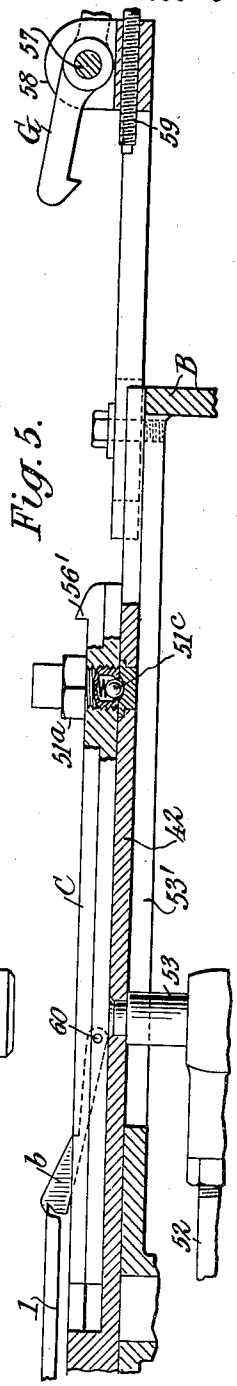


Fig. 5.

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CAN HEAD FEEDER FOR CAN BODY MAKING MACHINES

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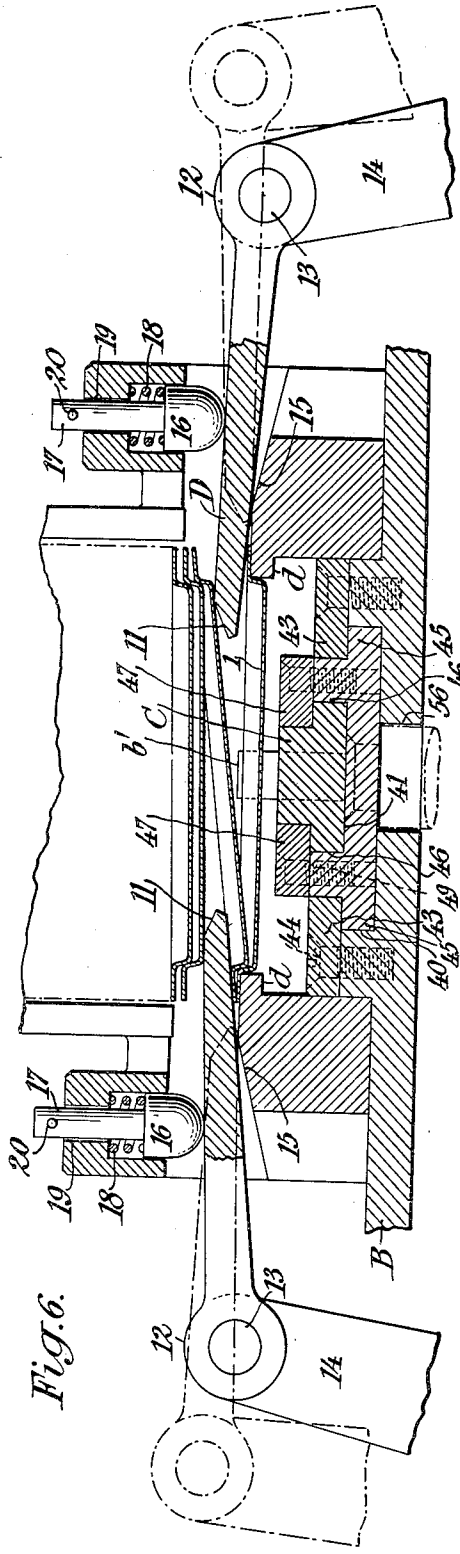


Fig. 6.

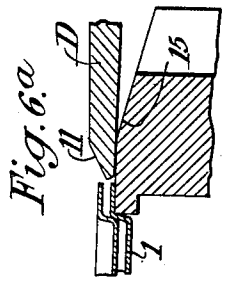


Fig. 6a.

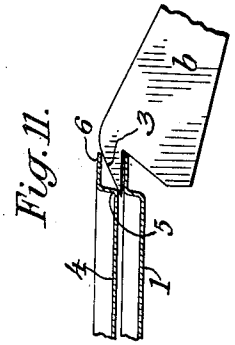


Fig. 11.

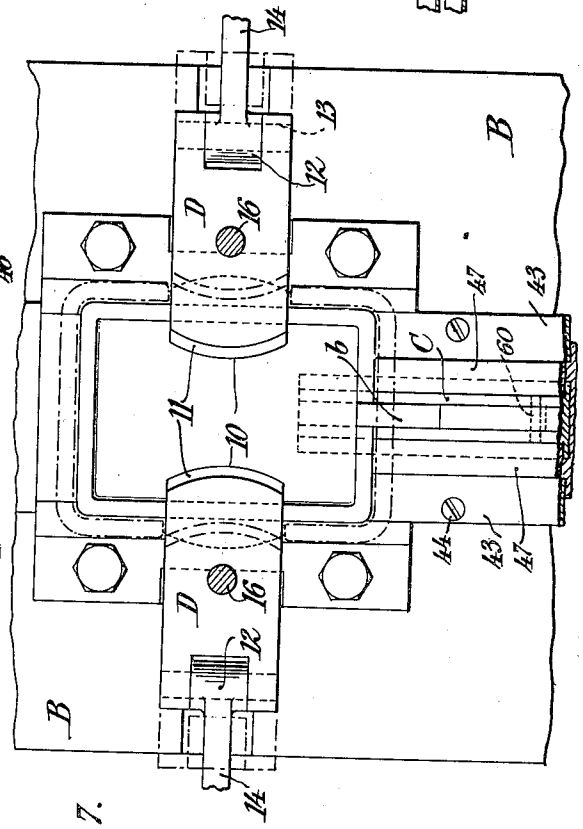


Fig. 7.

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Patented June 12, 1934 1,962,645

UNITED STATES PATENT OFFICE

1,962,645

CAN HEAD FEEDER FOR CAN BODY MAKING MACHINES

Frank Krueger, Brooklyn, N. Y., assignor to E. W. Bliss Company, Brooklyn, N. Y., a corporation of Delaware

Application April 26, 1932, Serial No. 607,558

23 Claims. (Cl. 113—114)

The present invention relates to mechanisms for separating and discharging single-dished articles successively from a stack of dished articles and adapted to feed the separated article to any machine that performs an operation on these articles successively. More particularly, the invention relates to improvements in can-head separating and feeding mechanisms for can heading machines, such as, for example, is contained in the patent to Gueritey, No. 1,747,626, dated February 18, 1930.

One of the objects of the present invention is to provide an improved mechanism for the separation of can heads from the stack of heads by eliminating separate rocking or tilting plates and combining the action of four separating devices into two simple "lever-pry" separators. These lever separators have no sidewise or horizontal rotary movement but a combined inward and upward motion, which results in a prying and lifting action. This greatly simplifies the design, reducing the number of required parts, and improves its accurary and certainty without decreasing its speed and output.

A further object of the invention is to provide an improved feed mechanism for feeding the can heads to the dial or magazine, after they have been separated from the stack of heads, which permits of a simplification in the design and operation of these mechanisms, resulting in a reduction of the number of parts required in its construction.

A still further object of the invention is to improve the control of the feed mechanism and to simplify the design of the mechanism for interrupting the feed of separated heads to the dial or magazine to prevent "double feeding". This results in a great reduction in the number of parts required, without decreasing the efficiency or certainty of the control.

Other objects will be apparent from a further reading of the specification.

In order that the invention may be more clearly understood, I have illustrated what is believed to be the preferred embodiment of the invention in the accompanying drawings, which are used in an illustrative sense and not in a limiting one. However, no attempt is made to show the complete structure of the machine, which is well known, but only those portions necessary to a proper understanding of this invention. In general, this invention relates to an improvement in mechanism for separating and feeding can heads from a stack to a dial or magazine feed, which forms a part of a general can-making machine, such as, for example, is disclosed in the aforesaid patent.

In said drawings:

Figure 1 is a view in elevation of a portion of the machine, parts broken away, and parts in section, showing a part of the magazine.

Fig. 2 is an end elevation viewed from the right of Fig. 1, parts broken away, and parts in section, taken on the line 2—2 of Fig. 1.

Fig. 2*a* is a detail of Fig. 2 showing the mounting of one of the rocker-arms.

Fig. 3 is an enlarged sectional view taken on the line 3—3 of Fig. 2, parts broken away, showing the feed-bar, the feed-bar being shown in its extreme position to the right, with the right or upper portion of the feed-bar locked.

Fig. 4 is a view similar to Fig. 3, showing the lower, or driven portion of the feed-bar, in its extreme position to the left, with the right, or upper portion of the feed-bar disengaged from the lower portion and locked.

Fig. 5 is a view similar to Fig. 4, showing the feed-bar in its extreme left hand position, both parts of the feed-bar being engaged, and the upper portion being unlocked, the locking-latch being shown in its unlocked or raised position.

Fig. 6 is an enlarged sectional view taken on the line 6—6 of Fig. 1, parts broken away showing the separating levers in position for separating a can from the stack of heads.

Fig. 6*a* is a fragmentary detail of Fig. 6, showing one position of the end of one of the separators.

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6, parts broken away and showing in plan the separating levers, on a reduced scale from that of Fig. 6.

Fig. 8 is a fragmentary detail of Fig. 1, partly in section, showing details of the cam-slide operating the cross-head for the feelers.

Fig. 9 is a fragmentary detail of Fig. 1, showing details of the slide and guide for the feelers' cross-head.

Fig. 10 is a sectional view taken on the line 10—10 of Fig. 9.

Fig. 11 is a diagrammatic view of the feed-finger showing its cooperation with the can head to be fed and the head next above.

Referring to the drawings, the can heads *a* are superposed in a stack held in a suitable reservoir or stack holder A, which is supported on a stand or table B. Beneath the stack holder A is the feed-bar C adapted to reciprocate from left to right in the drawings (Fig. 1) and carrying feed-fingers *b* and *b'*. This feed-bar C is adapted to

carry the lowermost can head in the stack, when separated therefrom by the two separator levers D, D, to the rotating magazine or dial E, only a portion of which is shown at the upper left of Fig. 1, but which is well known and will not be described, and is shown, for example, in the aforesaid patent. Immediately over the magazine E (hereinafter to be referred to as the dial) is the feeler F. The feeler F is located over a recess or pocket *c* in the dial E which immediately precedes a pocket (not shown) which is abreast of and in feeding position to receive a can head from the feed-bar C. This feeler F is adapted by suitable mechanism to be given a vertical reciprocating movement, so that in the event of the recess or pocket *c* being occupied by a can head, the feeler F, on contact therewith, will be lifted, which movement, by suitable mechanism, will lock the feed-bar and thus stop the feed-finger *b* (right-hand finger in Figs. 1 and 3) carried thereby and prevent another can head from being fed to the dial for one movement thereof, or until the next recess in the magazine comes beneath the feeler F, when the feed-bar will be unlocked. In the event the next recess in the dial coming beneath the feeler is not occupied by a can head, the feeler F will descend freely through this recess and will not arrest or lock the feed-bar.

The heads are then fed by the dial to a place where the head is assembled with a can body (not shown), the heads and bodies being assembled by means of any suitable carrier which is preferably of the intermittently rotating dial type, and which constitutes the most convenient means for carrying the heads and bodies in assembled relation to the heading or head-seaming mechanism (not shown). This device, the operation of the dial, the body feed and the power drive, will not be described as they are well known.

The general description thus given will serve to indicate the type of mechanism for separating the can heads from the stack and feeding them to the dial, to which the improvements constituting my invention apply, and how this mechanism cooperates with the general type of can-heading machine, which is well known and not a part of this invention. A more particular description of these improvements will now be given. For clearness only those parts which act upon the heads will first be described, the mechanisms for operating these elements being reserved for later description.

Separating the heads.—In feeding out the bottom head from a stack a serious problem has been encountered in properly separating the bottom head from the superincumbent heads of the stack. The heads (being of the usual dished form) are nested together in the reservoir or stack holder and are rarely held quite level or parallel, being commonly tilted somewhat, and often the flanges on one side or the other being in such close metallic contact that it is practically impossible to insert a separating blade between them. In overcoming these difficulties to automatically and rapidly effect their positive separation, complicated mechanisms involving a multiplicity of parts and consequently requiring manifold adjustments were heretofore required. It is therefore a purpose of this invention to obviate the above difficulties as hereinafter to be described.

Adjacent the stack of heads at the bottom thereof are two opposite separator levers D, D, which are moved simultaneously toward and away from the stack in a reciprocating motion. These levers are so mounted that their opposite or opposed ends have a simultaneous inward and upward movement toward the stack, which results, upon their entry between the flanges of adjacent heads, in a simple "lever-pry" action to lift the stack of heads above them.

The separator levers D, D are formed as tapered blades with a wedging contour on their inner or opposite ends and movable to reciprocate in synchonism toward and away from the stack. Their level is such that as they approach they enter just above the flange of the lowermost head; and if the next head is level they should both enter between the flanges of the lowest and next higher head. If, however, these flanges are pressed tightly together on one side, the separator on that side cannot enter, but is stopped by contact with the edges of these flanges (or more exactly, by the edge of the flange of the next to the bottom head), and is so mounted as to yield to this obstruction, so that it stops in abutment against the edge of the head. In the meanwhile the separator on the opposite side, finding a free opening between the edges of the heads, enters therein. As the result of this approaching movement of the separators, one or both of them have entered between the respective flanges. It sometime occurs (as shown in Fig. 6) that one of the separator levers will enter between the edges of the second and third heads from the bottom of the stack, which, however, leaves a free opening on the other side between the lowest and next higher head, for the other separator lever. Due to the wedging contour of the ends of the separator levers, and the movement communicated to them, these ends, on effecting an entry between the edges of the flanges, accomplish a simultaneous "lever-pry" and lifting action (Fig. 6) resulting in lifting the stack of heads and freeing or isolating the bottom head. However, if only one of the separators has entered between the edges of the heads, its "lever-pry" lifting movement alone will be effective, so that the stack of heads will be lifted only on that side. The separator on the other side will remain in abutment with the opposite edge of the can head, and due to its being mounted on a yielding arm, will momentarily be stopped for part of one cycle or rocking movement of this arm but will, during the next cycle, resume its reciprocation and repeat this operation, until an opening is encountered and an entry on that side is effected.

Feeding the heads.—The bottom head having thus been separated or isolated by the lifting of the stack of superincumbent heads, is free to be fed. Its opposite edges or flanges rest on two parallel rails or ledges *d, d,* along which it may be slid in feeding it forward to the dial E. The feeding movement is imparted by feed-fingers *b* and *b'*, one of which comes behind the can head and pushes it forward (to the left in Figs. 1 and 3). These feed-fingers are carried on a feed-bar C which is given a linearly reciprocatory movement. The feed-fingers *b* and *b'* are so shaped (as shown in Fig. 3) and at such a level, that the primary feed-finger *b* (right-hand finger in Figs. 1 and 3) is able to pass under the head next above the isolated head during its forward movement; similarly, on account of the shape of the tops of these fingers and due to the fact that they are depressably or yieldably mounted, during the backward or return movement of the feed-bar, the secondary feed-finger *b'* (left-hand finger in Figs. 1 and 3) passes under the can head 2 (Fig. 3) previously fed

thereto by the primary finger *b* on its first forward movement, and the primary finger *b* in the same manner passes under the next isclated head to be fed. As shown in Fig. 11, the forward upper portion of the primary feed-finger has a wedge-shaped contour. This portion is so shaped as to permit it to fit against the side of the bottom and the under edge of the flange of the head next above the isclated head next to be fed. Consequently this portion wedgingly lifts or pries that head upwardly, but due to the shape of its rounded top, passes beneath this head in feeding out the isolated head from under the stack. This supplements the work of the separator levers in separating or isolating the heads from the stack. During the next forward movement of the feed-bar, the can head 2 is further advanced to the left (Figs. 1 and 3) and seated in the pocket or recess *c* in the dial E.

Misplaced or damaged heads.—It occasionally happens that a head is misplaced in the stack by being inverted. When this occurs, since its flanges or end portions rest upon those of the next lower head, difficulty is apt to be experienced in separating out the lowest head, because the separator levers on either side may not enter between these flanges. In such case, when the primary feed-finger encounters the flange of the lowest head, the reaction on the feed mechanism is sufficient to overcome the yielding grip of a clutch 51 (to be described later) holding that portion to the feed-bar, automatically detaching this part therefrom, and preventing subsequent damage to the can head and to the machine. In this case the feed of heads will be interrupted until the operator removes the inverted head. When, however, the separation takes place properly and the inverted head is separated from the stack, the same action takes place in the interruption of the feed. This is because the dished portion cannot pass out from under the stack due to the limited clearance between the guide rails *d, d,* and the stack guides 9. Similarly, when a damaged head is isolated from the stack, and cannot, for this reason pass out from under the stack, the same action takes place to detach the feed mechanism. This inverted or damaged head is then removed by the operator.

Description of mechanism.—The mechanism by which the several devices thus far described are operated will now be described.

Stack and separators.—The stack holder or reservoir A is mounted on the table B and is of any usual or suitable construction, being a skeleton frame conforming in horizontal cross-section to the contour of the heads. In this the stack of heads is held, the flange of the bottom head resting at opposite sides upon the ledges or rails *d, d.* Immediately over the guide-rails *d, d,* are spaced parallel stack guides 9. These guides are parallel to and in spaced relation with the guide rails *d, d,* and afford sufficient clearance therebetween to permit the flange of a properly placed separated or isolated head to pass through. However, insufficient clearance is provided to permit either an inverted head or one having a damaged flange to pass through. The separators D, D, consist of tapered flat reciprocable levers having rounded ends 10 with tapered margins, as clearly shown in Fig. 7. The upper portion 11 of this margin (Fig. 6) is tapered inwardly and downwardly toward the stack, and the lower portion thereof is tapered downwardly and outwardly away from the stack, thus forming a wedge-shaped contour with a lower blunt edge. Each of these levers has a yoke 12 at the outer end thereof pivotally mounted on the pins 13 carried by the upper ends of the rocker arms 14, as best shown in Figs. 6 and 7. The other ends of these levers, comprising the inner or opposed ends, have end portions which are supported in sliding relation with the inclined surfaces or supports 15, which form a guide for controlling the path of entry of the inner ends of these levers into the stack. In order to restrain these levers from leaving the surface of the guides 15 as a precautionary measure, yieldable stops or pressers 16, with stems 17 and springs 18, may be slidably mounted in guides 19 (Fig. 6). As shown in Figs. 2 and 6, the stems 17 may be fitted with a split pin 20 for limiting the vertical movement of the presser.

The levers D, D are given a simultaneous reciprocating movement towards and away from the stock by the rocker arms 14. The extreme forward or inward position of these levers and the upper portions of their rocker arms are clearly shown in Figs. 6 and 7, the dotted lines indicating their retracted or extreme outward position. These rocker arms 14 are pivoted (Figs 1 and 2) on stationary horizontal shafts 21 mounted on the bracket 22. Referring now to Fig. 2, levers 23 have their outer ends pivotally mounted on the shafts 21 which act as a fulcrum for these levers, and their inner ends in operative relation to a cam roller 24. These levers have arms 25 which are yieldably held in operative contact with lower portions of the arms 14 by springs 26. Adjusting studs 27 are fitted to the rocker arms for adjusting their movement. It is therefore apparent that since the arms 14 are yieldably operative that the separator levers D, D are likewise yielding in their operation. A cam roller 24 for operating the levers 23, engages with a cam groove 28' in the cam wheel 28 which is fixed on a horizontal shaft 29 (Fig. 1). Upon rotation of the cam wheel 28 it will be apparent that the cam roller 24 through the agency of the levers 23 and their arms 25, will impart a reciprocating rocking movement to the rocker arms 14. Motion is imparted to the shaft 29 and cam wheel 28 by miter gears 30, one of which is mounted on the upper portion of a vertical shaft 31, which is driven at its lower end by miter gears 32. One of these gears 32 is connected through a spring-clutch 33 to the shaft 31 and the other is power-driven by any suitable means.

The rocker arms 14 being yieldably held by the springs 26 in contact with the arms 25 of the operating levers 23 it will be apparent, as already pointed out, that the separator levers D, D are yieldably operated so that when either one of the ends of these levers encounters the edge of a head-flange and is stopped, the respective rocker arm on which the stopped separator lever D is mounted will be pulled away from the arm 25 against the action of the spring 26 and thereby rendered inoperative for one part of its cycle, or until its separator lever D effects an entry between the heads or the obstruction is removed therefrom.

Referring to Fig. 6, it will now be evident from the foregoing that upon imparting a rocking reciprocatory motion in the vertical plane to the rocker arms 14, that there will be communicated to the levers D, D a reciprocating motion toward and away from the stack and due to the guiding influence of the surface 15, a simultaneous inward and upward movement of the levers into

the stack will result. It will also be apparent from Fig. 6, that the arms 14 move the pivoted ends downward and inward so that the opposed ends of the separator levers will pry upward as they enter between the edges of the heads. It will further be seen that the guiding surfaces 15 form coacting surfaces with the separator levers D, D, on which each of these levers is successively fulcrumed at different points, resulting in a simple "lever-pry" action to lift the stack of heads beneath which these levers are thrust. It will still further be seen that the entry of the levers into the stack is at such level, due to the guide surfaces 15, as will permit the levers to enter between the bottommost head and the stack, and that the lifting action of the levers on the stack is enhanced by the wedge-shaped contour of the opposed ends thereof.

Head feeders.—The reciprocable feed-bar C operates in a slide 40 positioned longitudinally in the table B and beneath the stack holder A. This bar C forms a linearly reciprocable conveyor for conveying the isolated can heads to the dial E, and comprises two portions or members forming a slide within a slide, consisting of the upper portion 41 and the lower or driven portion 42 (Fig. 6). Parallel spaced gibs 43 are secured by screws 44 to the table B on each side of the slide 40 and overlap the shoulders 45 located on each side of the lower portion 42 of the feed-bar C and hold it therein in slidable relation. The lower, or driven portion 42 of the feed-bar, is fitted with a longitudinal slideway 46 which carries the upper portion 41 of the feed-bar. Spaced parallel gibs 47 secured by screws to longitudinal shoulders 49 on each side of the slideway, overlap the margins of the upper portion 41 of the feed-bar and hold this portion in slidable relation therewith. Normally the upper and lower portions of the feed-bar are held in fixed relation by the spring-ball or friction clutch 51, but are thereby detachably connected and may be placed in sliding relation by holding the upper portion, when the yielding grip of the clutch will be overcome and the lower portion will reciprocate alone. The feed-bar C is linearly reciprocated through a link 52 which is pivoted at one end to pin 53 riveted or otherwise suitably secured at 54 to the lower or driven portion of the feed-bar. The other end of the link 52 engages a crank 55′ shown as mounted on a horizontal wheel 55 secured to the upper end of shaft 31 and rotated thereby. The pin 53 operates in a longitudinal slot 53′ in the table B. The upper portion 41, carried by the lower portion 42, is therefore also continuously reciprocated until it is desired to interrupt the feed of heads, when it is held fast by the operation of the locking-latch 56 (Fig. 3). The locking latch 56 is pivotally mounted on a pin 57 carried by a yoke 58 adjustably mounted on the table B and is shown in its locked and unlocked positions in Figs. 3 and 5, respectively. The adjustment of the position of yoke 58 is effected by screw-stud 59 and nut (not shown).

Feed-fingers *b*, *b* are mounted on the feed-bar or conveyor C, the primary finger *b* (to the right in Fig. 3) being pivotally mounted at 60 to the upper portion 41 of the feed-bar, and the secondary finger *b*′ (to the left in Fig. 3) being similarly mounted at 61 to the lower or driven portion 42 of the feed-bar. These fingers are yieldably and depressably mounted on springs 62 and 63, and are held in position against the action of these springs and prevented from raising by the finger-stop plates 64 and 65 which are secured by screws 66 and 67, respectively to the upper and lower portions of the feed-bar. The upper end portion of each of these fingers is rounded (Fig. 3) and adjacent the rounded portion at the forward end thereof (to the left in Fig. 3) is a slot or cut-in portion 68 for engaging with the flanged edges of the can heads when these heads have been isolated from the stack. The primary finger *b* (Fig. 11) has a wedge-shaped end portion 3 adjacent the rounded upper portion, adapted to engage the head 4 at 5 and 6 and while feeding the lower, or isolated head 1, to wedgingly lift the can head 4. This completes the separation or isolation of the heads instituted by the levers D, D. Referring to Figs. 3 and 6, it will be noted that the feed fingers are so mounted, that on a forward movement of the feed-bar C, (to the left in Fig. 3) the primary finger will enter beneath the stack holder at such a level as to permit it to feed the bottom head (isolated from the stack) when its flanges are resting on the ledges *d*, *d*, but to pass under the next higher head. During this movement the can head *a* (Fig. 3) is moved from position 1 to the left to the position occupied by the can head 2 in Fig. 3 (referred to as the intermediate position) and the secondary finger *b*′ during the same movement of the feed-bar will further advance a can head in the intermediate position to the left, where it is seated in the pocket or recess *c* in the dial (Fig. 1). During the backward or return movement of the feed-bar, it will be apparent from the foregoing that due to the shape of the top of, and the mounting of these fingers, the secondary finger *b*′ will pass under the can head 2 (Fig. 3) previously fed thereto by the primary finger *b* on its first forward movement, and similarly this primary finger will pass under the next isolated head to be fed.

In order that the can-heads may be guided along the ledges or rails *d*, *d*, after leaving the vicinity of the stack during their movement to the dial, and at the same time prevented from leaving them, feed guides 69 (only one shown in Fig. 3), consisting of spaced parallel plates or bars, may be provided, yieldably mounted on rods 70 in such spaced relation with the rails or ledges *d*, *d* as will permit the flanges of the can heads to pass thereunder. Springs 71 hold the guides 69 in place in a yieldable manner and nuts 72 permit adjustment of the tension of the springs.

The spring-ball or friction clutch 51 comprises a plug or holder 51*a* having an inner cavity carrying spring 51*b* and ball 51*c* and forming the male portion of the clutch and plate 51*d* having an indenture or recess 51*e* adapted to receive a portion of the ball 51*c*, forming the female portion thereof. The plug 51*a* is threaded into or secured in any suitable manner in the upper portion 41 of the feed-bar C, and the plate 51*d* is riveted or otherwise secured in a suitable manner to the lower portion 42 of the feed-bar. The bottom of the cavity in the plug 51*a* has a shelf or ledge for supporting the ball 51*c* and permitting a portion thereof to extend outside the cavity. The top of this cavity is closed by a screw plug which is adapted to compress the spring 51*b* and regulate its pressure on the ball 51*c*. This pressure is so regulated that when the upper and lower portions of the feed-bar are slidably engaged to bring into coincidence the male and female portions of the clutch 51, the resistance of the clutch will be sufficient under normal conditions to hold these portions of the feed-bar together, but when

the upper portion of the feed-bar is locked by the latch 56, to permit the lower portion to be detached by the driving action thereof.

Head feed interrupter.—The means for interrupting the feed of the heads so as to avoid feeding a second head to a recess *c* in the dial E which already contains one, will now be described.

The feeler F, as described, has a rising and falling movement; if it descends freely through the recess *c* it does not arrest the head-feed (upper portion 41 of the feed-bar C and primary finger *b*); but if in descending it is arrested by the presence of a head in the recess, its stoppage arrests the feed. This it does by locking the upper portion 41 of the feed-bar C by means of the locking latch 56, and as described, permits this portion to be detached from the lower or driven portion of the feed-bar, thus arresting the action of the primary feed-finger. The means for operating the locking-latch 56 for this purpose is best shown in Figs. 1 and 2.

The upper and lower portions 41 and 42, respectively, of the feed-bar C as described, are normally held together in fixed relation by the spring clutch 51, and the latch-lock 56 in its raised or unlocked position is shown in Fig. 5.

The feeler F is slidably mounted in one end of a bracket 82 on which a rocker arm 80 is pivoted at 81; the bracket 82 is secured to the table A (Fig. 1). Feeler F is connected to one end of the rocker-arm 80 and its other end is pivotally connected to the upper end of a vertical rod 85 movable in a slideway 84 and whose lower end engages in sliding relation with a rod 87 (Fig. 2) on which it is yieldably supported by means of a spring 88. The rod 87 is mounted on one end of a cross-head or arm 89 which communicates a vertical reciprocating motion to the rod 85 through the spring 88 and hence to the feeler F. This reciprocatory motion is imparted to the cross-head 89 by means of a cam-wheel 90 through the medium of cam-roller 91, bell-crank lever 92, and cross-head slide 93 (Figs. 8, 9 and 10). The cam-wheel 90 is fixed on the main drive shaft 90'. The rod 85 carries a cam 94 (Figs. 1 and 2) which operates a cam-roller 95 carried at the end of a lever 96, which is pivoted at 96'. Pivoted near the end of the lever 96 is a rod 97 which connects it to one end of a bell-crank lever 98, the other end of which lever is connected through spring 99 and rod 100 to the outer end of the locking-latch 56. A spring 99' connects the lower arm of the bell-crank lever to the frame or bracket 99'', and acts with the spring 99 to normally hold this lever in such a position as to keep the locking-latch 56 raised, at the same time to hold cam-roller 95 in engagement with cam 94.

When the descending motion of the feeler F is arrested, as described, on encountering a can head in the pocket or recess *c*, the feeler end of the rocker-arm 80 will be stopped, depressing its other end and moving the vertical rod 85 downward, against the action of the spring 88, sufficiently to cause the raised portion of the cam 94 (Fig. 1) through its roller 95 to move the lever 96 to the right. This motion of the lever 96 is communicated through the rod 97 and bell-crank lever 98 to compress the spring 99 and raise rod 100 to lower and lock the latch 56 with the lug 56' on the end of the (right in Fig. 3) upper member 41 of the feed-bar. This arrests the feed of heads for one feeding movement or until the feeler F encounters no head in the pocket C, when the continued movement of the feeler F is uninterrupted, and permitting the spring 88 to raise the rod 85 to a position where the reduced lower portion of the cam 94 engages with the cam-roller 95. The action of the spring 99 and 99' will then, in conjunction with the levers 96, 97, 98 and 100, cause the locking-latch to be raised, thus freeing the upper member 41 of the feed-bar. This permits the two members of the feed-bar to become attached again upon the functioning, as described, of the clutch 51.

The vertical rod 101 (Fig. 2) is connected to the cross-head 89 in the same manner and operates in the same way as the rod 85, to actuate a second feeler (not shown) for interrupting the feed of bodies. This second feeler and its cooperating mechanism will not be described as it does not form a part of this invention but which is well known and described, for example, in the aforesaid Guerity patent.

Drive mechanism.—Any suitable source of power may be used and applied in the conventional way to drive gears 102 and 103 (shown in dotted lines in Fig. 2). The gear 102 is mounted on and drives the shaft 90' and the gear 103 is mounted on and drives the shaft 32' carrying one of the miter gears 32.

While I have shown and described one embodiment of the invention as applied to the conventional can-heading machine, it will be understood that I do not wish to be limited thereto since it may be used in selecting and feeding other than can heads, provided these articles have flanges or are dished, to any machine that performs an operation on these articles successively. I also do not wish to be limited to this embodiment of the invention as shown and described herein since various changes may be made therein without departing from the spirit thereof.

What I claim is:

1. Mechanism for separating can heads from a stack, comprising opposed separating levers, means for moving said levers inwardly and outwardly with respect to the stack, and for tilting them to move their inner ends upwardly, the inward movement normally entering said ends between the lowermost head and the stack and the upward movement forcibly lifting the said stack to free the said lowermost head.

2. Mechanism according to claim 1, comprising reciprocable yieldable separating levers.

3. Mechanism according to claim 1, wherein said moving means are yieldable.

4. Mechanism according to claim 1, wherein the movement of said levers is confined to one plane.

5. Mechanism according to claim 1, wherein said levers have a tapered portion with wedge-shaped ends having an inwardly and downwardly tapered margin.

6. Mechanism according to claim 1, wherein said levers are yieldably mounted so that when either encounters closely adjacent flanges of the can heads, said encountering lever may remain in contact therewith while the other enters between the heads.

7. Mechanism according to claim 1, wherein the said inward and upward movement of the said ends is simultaneous.

8. Mechanism according to claim 1, wherein said levers have wedge-shaped ends having inwardly and downwardly and downwardly and outwardly tapered margins.

9. Mechanism for separating can heads from a stack, comprising reciprocable opposed levers, yieldable means for moving said levers towards and away from the stack, guiding means for sup-

porting an end of the said levers and controlling the path of entry of said levers into the stack, said yieldable means and said guiding means combining to give the ends of the said levers an inward and upward movement toward the stack, the said levers having ends adapted to be stopped on striking the edge of a head and a wedge-shaped contour adapted on entering between the edges to lift the upper one.

10. Mechanism according to claim 9, wherein the inward and upward movement of the said ends is simultaneous.

11. Mechanism according to claim 9, wherein said levers are mounted so that when either enters the stack over the top of a plurality of closely adjacent heads the other enters between the lowest head and the stack, thereby placing the said lowest head in a position to be fed.

12. Mechanism for separating can heads from a stack, comprising opposed reciprocable levers each having a pivoted end, yieldable arms on which said levers are pivoted, a support on which said levers slide, said arms adapted to move said pivoted ends downward and inward so that the opposite ends of said levers pry upward as they enter between the edges of adjacent can heads and means for operating said arms.

13. Mechanism according to claim 12, wherein at least one of said reciprocable levers is mounted on a horizontal pivot.

14. Mechanism according to claim 12, wherein one of said reciprocable levers is pivotally mounted upon a supporting pivoted arm.

15. Mechanism according to claim 12, wherein said support is inclined.

16. Mechanism according to claim 12, with a yieldable overhead presser for confining the movement of said levers to said surface.

17. Mechanism for separating can heads from a stack, comprising opposed separating levers, means for moving said levers longitudinally inwardly and outwardly with respect to the stack, and means for simultaneously tilting said levers in the vertical plane for imparting to the inner ends of said levers inward and upward movements, the inward movement normally entering said ends between the lowermost head and the stack and the upward movement lifting the said stack to free the said lowermost head, and feeding means adapted to feed the bottommost head from under the lifted stack.

18. Mechanism according to claim 17, the feeding means comprising a finger having a wedge-shaped upper portion adapted to fit against the side of the bottom and under edge of the flange of the head next above the bottom head, and to wedgingly lift the said next upper one as it passes therebeneath to feed said bottommost head.

19. Mechanism for feeding can-heads separated from a stack and conveying them to a dial, comprising a two-part linearly reciprocable feed-bar, said parts comprising a driven member and a detachable member carried thereby in normally fixed relation thereto, said members being detachably connected by a yieldable friction clutch, means for locking one of said members whereby the other is adapted to be detached and permitted to move, a feed-finger carried by one of said members adapted to feed the bottommost head separated from the stack, and means carried by the other member adapted to advance such removed head to the dial.

20. Mechanism according to claim 19, wherein means are provided for interrupting the feed of said finger to prevent double feeding to the dial, said means comprising a locking member for locking and holding said detachable member against reciprocation and means actuated by a feeler at said dial for operating said locking member when the said dial is occupied by a head.

21. Mechanism according to claim 19, wherein said finger has a wedge-shaped upper portion adapted to fit against the side of the bottom and under edge of the flange of the head next above the head to be fed and to wedgingly lift the said first mentioned head as it passes therebeneath to feed the bottommost head in the stack.

22. Mechanism for separating can heads from a stack, comprising initial separating means entering between the lowermost head and the stack for preliminarily lifting the stack, and a feed finger adapted to enter above the edge of the lowermost head and having an inclined upper surface extending high enough to wedgingly lift the next upper head as it passes therebeneath to feed the lowermost head.

23. Mechanism for separating can heads from a stack, comprising initial separating means entering from opposite sides between the lowermost head and the stack for preliminarily lifting the stack, and feeding means movable transversely to the movements of such separating means, for feeding out the lowermost head, having a feed finger adapted to enter above the edge of said lowermost head, said finger having an inclined upper surface extending high enough to wedgingly lift the next upper head as it passes therebeneath.

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