Aug. 26, 1924. 1,506,099

R. O. WILSON ET AL

CAN CAP FEEDING DEVICE

Filed Jan. 26, 1921 2 Sheets-Sheet 1

Fig. 1.

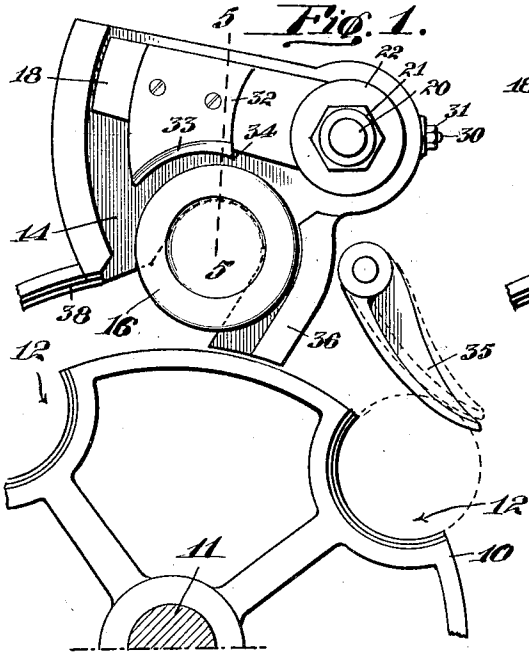


Fig. 2.

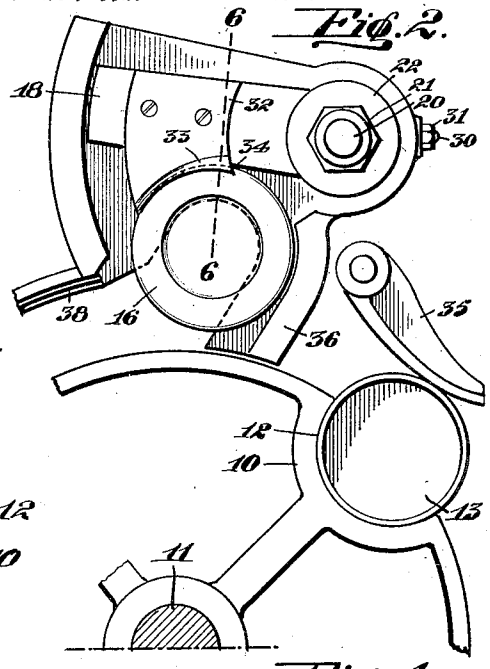


Fig. 3.

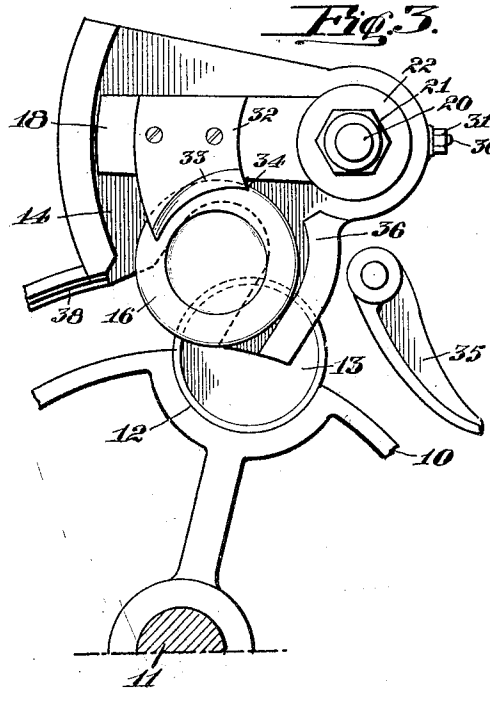
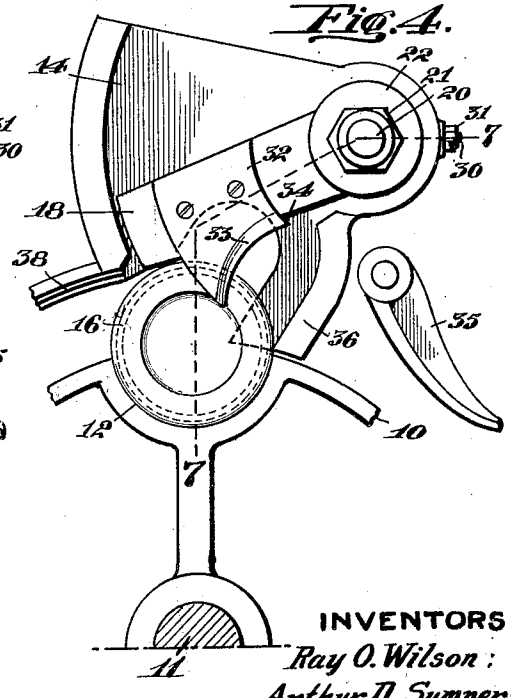


Fig. 4.



INVENTORS

Ray O. Wilson:

Arthur D. Sumner:

By R. S. Berry,

Attorney.

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Fig. 5.

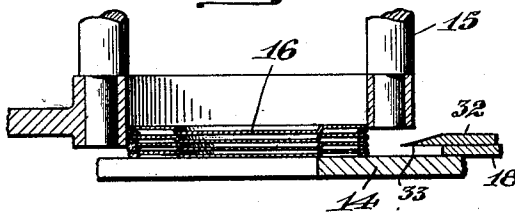


Fig. 6.

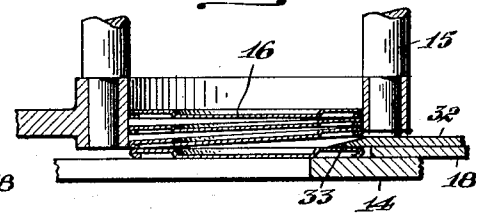


Fig. 7.

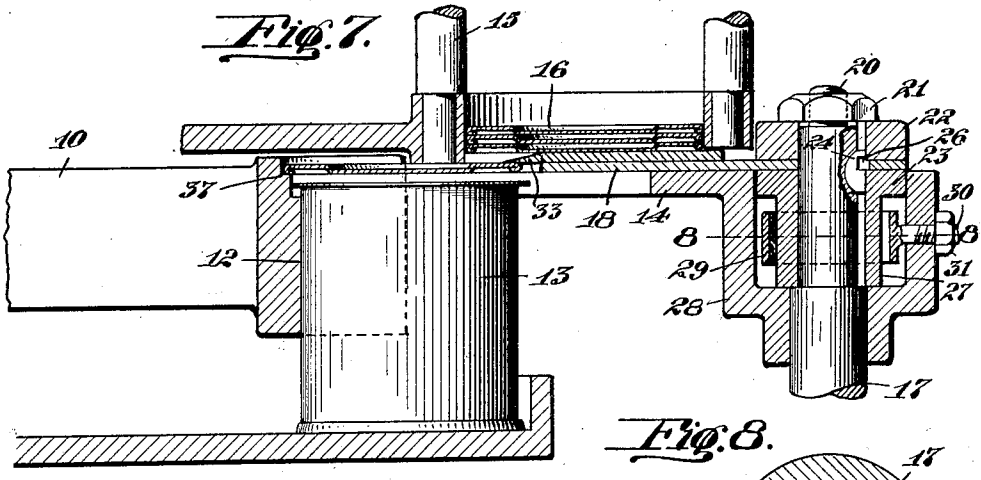


Fig. 8.

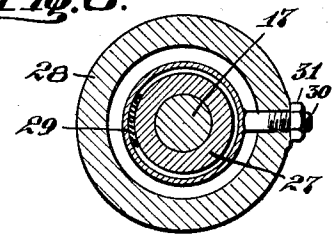
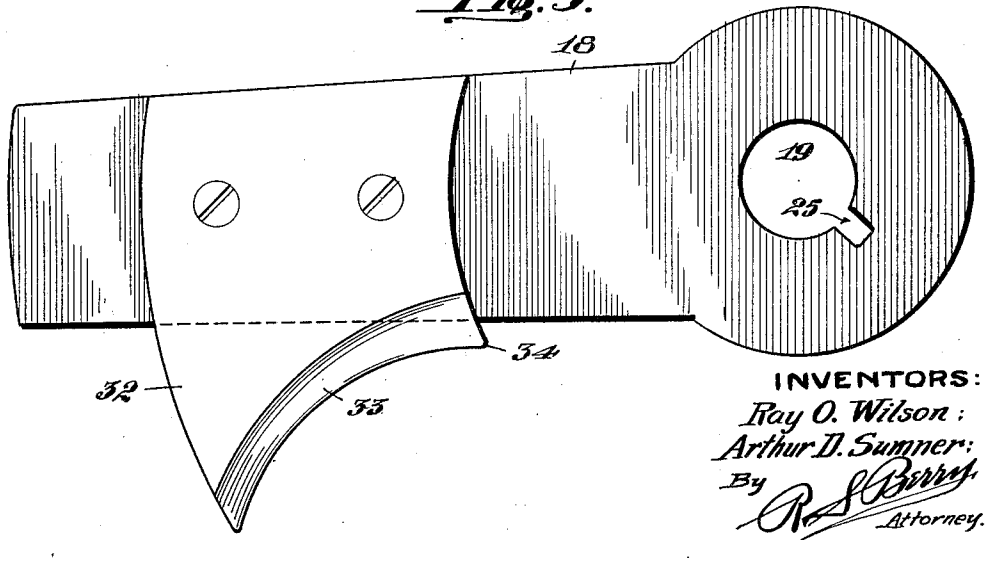


Fig. 9.



INVENTORS:
Ray O. Wilson;
Arthur D. Summer;
By R. S. Berry,
Attorney.

Patented Aug. 26, 1924. 1,506,099

UNITED STATES PATENT OFFICE.

RAY O. WILSON AND ARTHUR D. SUMNER, OF LOS ANGELES, CALIFORNIA, ASSIGNORS OF FORTY-NINE ONE-HUNDREDTHS TO FRANKLIN F. STETSON, OF LOS ANGELES, CALIFORNIA.

CAN-CAP-FEEDING DEVICE.

Application filed January 26, 1921. Serial No. 440,216.

To all whom it may concern:

Be it known that we, RAY O. WILSON and ARTHUR D. SUMNER, citizens of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Can-Cap-Feeding Devices, of which the following is a specification.

This invention relates to a can-cap feeding mechanism, and particularly pertains to a device for delivering can ends or caps to can bodies as the latter are advanced and fed into a can-capping machine.

An object of this invention is to provide a construction and arrangement in a mechanism for feeding can-caps whereby ejection of a can-cap from a cap container will be effected with a minimum of risk of the cap being jammed or the feed obstructed, and by which irregularities in the caps, such as dents or bends therein will not interfere with the functioning of the feed.

Another object is to provide a can-cap ejector which is so mounted that it may be automatically retracted and thrown out of an operative position in event jamming of a cap should occur so as to protect the feed mechanism against injury due to obstruction of the ejector.

A further object is to provide an effective means for separating a can-cap from beneath a stack of caps and to advance the separated cap into register with the end of a can body as the latter is advancing on an arcuate path of travel and insuring proper positioning of the cap relative to the can body.

With the foregoing objects in view and such other objects as may later appear, our invention consists in the construction and arrangement of parts or their equivalents hereinafter set forth and illustrated by way of example in the accompanying drawings, in which:

Figures 1, 2, 3, and 4 are plan views of the cap's ejecting mechanism showing the manner of feeding a cap to a rotary can carrier;

Figure 1 showing the ejector in its retracted position;

Figure 2 showing it on its initial advance movement;

Figure 3 showing the ejector in an intermediate advanced position; and

Figure 4 showing it in its fully advanced position and depicting the can-cap as delivered to a can body.

Figure 5 is a detail in vertical section as seen on the line 5—5 of Figure 1.

Figure 6 is a detail in vertical section as seen on the line 6—6 of Figure 2.

Figure 7 is a view in section as seen on the line 7—7 of Figure 4.

Figure 8 is a view in horizontal section as seen on the line 8—8 of Figure 7.

Figure 9 is a detail plan view of the cap ejector device.

More specifically, 10 indicates a rotary can body carrier mounted on a shaft 11 and formed with recesses 12 adapted to receive can bodies 13 to advance the latter, as is common in can-capping machinery. Disposed at one side of the rotary carrier is a can-cap supporting plate 14 above which is located a can-cap guide rack 15 adapted to receive a stack of can-caps 16 the lowermost of which seats on the plate 14; the lower end of the rack being supported above the plate and spaced therefrom so that the lowermost cap may be passed therebeneath.

Extending upwardly through the plate 14 at a point adjacent to the stack of can-caps is an oscillatory shaft 17 which may be operated in any desired manner, but which is preferably actuated by the mechanism disclosed in our copending application filed coincident herewith and bearing filing date of January 26, 1921, and Serial No. 440,217.

Mounted on the upper end of the shaft is a pusher bar 18 comprising a flat plate and which extends across the plate 14 and is adapted on being advanced with the shaft to pass beneath the cap rack to eject the lowermost cap as will be later described. The pusher bar is preferably so mounted on the shaft that in event of its movement being obstructed it may turn relative to the shaft to prevent damage, and for this purpose it is mounted as shown in Figure 7, that is, the bar is formed with a circular opening 19 to receive the end of the shaft which projects through the bar and has a reduced threaded end portion 20 to receive a nut 21. A washer 22 is interposed between the nut and the bar and on tightening of the nut clamps the bar against a collar 23 fixed on the shaft, the upper end of which is nearly flush with the top face of the plate 14; the bar thus being adapted

to be turned on the shaft in emergency but is sufficiently tight thereon to effect the cap ejecting operation. The collar 23 is secured on the shaft by a key 24 which engages the shaft at a point to pass through the bar and serve as a key for the washer 22; the collar and the washer both being formed with channels to receive the key.

In order that the pusher bar may be put in place and encircle the key it is formed with a notch 25 on the margin of the opening 19, and as a means for inhibiting engagement of the bar by the key the latter is formed with a notch 26 arranged opposite the bar and through which the margin of the opening 19 may pass. The collar 23 has a reduced downwardly extending portion 27 which forms a drum and is arranged in a housing 28 formed on the underside of the plate 14. A brake band 29 encircles the drum, as shown in Figure 8, and is adapted to frictionally bear thereon to oppose loose movement of the shaft; the band being adjusted by means of a threaded stud 30 which is affixed thereto and extends through the side wall of the housing 28 and is engaged by a nut 31. On screwing the nut on the stud to bear against the housing the band may be caused to bear against the drum.

An important feature of this invention resides in a means for separating the bottom can-cap from the stack and comprises a blade 32 mounted on the pusher bar and having an arcuate knife edge 33 which projects forwardly of the bar and is adapted to enter between the two lower caps in advance of the pusher bar and to extend over the lowermost cap as the pusher bar is advanced on its arcuate path. As a means for insuring the proper introduction of the blade between the caps the blade is designed to have a slicing action as it moves into engagement with the caps and for this purpose its arcuate edge is formed to extend excentric to the periphery of the cap when disposed adjacent thereto and the inner end of the blade is so protruded as to form a point 34 which will initially penetrate the space between the caps as the blade advances.

In the operation of the invention, the cap ejector, comprising the pusher bar 18 and the blade 32, is normally retracted and stationary clear of the can-caps, as shown in Figures 1 and 5. The carrier 10 is rotated and when a can body 13 is positioned in a recess 12 it will strike and rock a wiper 35 as shown in Figure 2 to throw into operation a driving mechanism (not shown) by which the shaft 17 is oscillated to advance and retract the cap ejector. On the forward arcuate movement of the cap ejector the tip 34 of the blade will enter between the two lowermost caps as shown in Figures 2 and 6, and the knife edge will slide with a slicing movement between the caps. The pointed penetration of the blade lessens possibility of the blade striking the edge of a can-cap and with the slicing action insures the blade properly separating the caps in event they are bent or dented at their edges. The blade thus rides over the lowermost cap and the pusher bar moves against the cap and shoves it forward as the bar advances, the cap being advanced on the plate 14 against a guide flange 36 on the plate 14 which flange extends toward and terminates adjacent the arcuate path of travel of the can-body carrier and inclines at an angle relative to the pusher-bar toward the direction of the advance movement of the can-body carrier. The can-cap is thus positioned between the stationary guide flange and the advancing pusher-bar and by reason of the angular relation of the flange and pusher bar the can-cap is caused to move outwardly and to traverse the length of the guide flange and also advance longitudinally of the pusher bar, so that when the pusher-bar is in its fully advanced position the can-cap will be projected onto a cap supporting shoulder 37 in the can-body receiving recess and positioned above the can-body, as shown in Figures 4 and 7. The guide flange terminates at its outer end at such point and the pusher-bar is of such length and moves such distance that the can-cap will be caused to be advanced by the pusher-bar about half the diameter of the cap beyond the end of the flange, so that the cap will be projected into the recess 12.

The movements of the can carrier and the cap ejector are so timed that when the push bar reaches its forwardmost position, the can-body receiving recess will be disposed to receive the can-cap. When the cap has been ejected it will be supported at its outer edge on the shoulder 37 in the recess as shown in Figure 7, and at its inner edge on the plate 14. The cap will then be engaged by the can carrier and carried forward thereby, and moved clear of the ejector, whereupon its inner edge will be supported on a track 38. The pusher-bar is designed to pause at the termination of its advance stroke until the cap has been moved clear of its outer end so as to obviate any possibility of the cap being forced backward and thus insure its being carried forward, which pause is effected by the cap ejector driving means set forth in the application before referred to.

The pusher-bar is so arranged relative to the can-cap and the guide flange that on initial movement of the pusher-bar it will contact the edge of the can-cap at a point approximately at right angles to the point of contact of the cap with the guide flange

so that on advance movement of the pusher-bar a rotary or rolling motion will be imparted to the can-cap so that the latter will have a rolling movement when entering the can-carrier, thus effecting a smooth action.

When the cap ejector is in its advanced position the stack of caps will be supported thereon as shown in Figure 7, but on retraction of the bar clear of the stack it will drop to the plate 14 and dispose another cap in position to be advanced by the pusher-bar.

In event a cap should become jammed so as to prevent movement of the pusher-bar, or should the movement of the pusher-bar be otherwise obstructed, the shaft may turn relative to the pusher-bar by reason of the frictional engagement therebetween before described.

From the foregoing it will be seen that we have provided a simple and effective cap feeding mechanism by which a cap may be removed from beneath a stack of caps and advanced to one side thereof into a position above a can-body moving on a circular path, and which mechanism is not liable to get out of order or to injure the caps handled thereby.

We claim:

1. In a can-cap feeding mechanism, an oscillating pusher-bar arranged to intersect a stack of can-caps on its forward movement and adapted to advance the lowermost can-cap, and fixed means co-operating with the pusher-bar on its forward movement for causing the can-cap being advanced by the pusher-bar to move longitudinally of the pusher-bar and be ejected at the outer end of the pusher-bar.

2. In a can-cap feeding mechanism, a horizontal can-cap supporting plate, a fixed guide flange on said plate located to extend to one side of a can-cap stack on the plate, and an oscillatory pusher-bar mounted to traverse said plate toward and away from one side of said guide flange and to intersect the stack of can-caps, said pusher-bar co-operating to advance a can-cap from beneath the stack against the guide flange, and the latter co-operating with the pusher-bar to shove the can-cap outwardly in the direction of the length of the pusher-bar.

3. In a can-capping machine, a horizontal rotary can-body carrier having a can-body receiving recess formed with a can-cap receiving shoulder, said recess to traverse an arcuate path, a horizontal can-cap supporting plate at one side of said carrier, a stationary guide flange on said plate extending toward the arcuate path of travel of the recess and extending diagonally toward the direction of advance movement of the carrier and located to one side of the can-cap stack, an oscillatory pusher-bar normally extending clear of the can-cap stack on the side thereof opposite the guide flange and adapted on its advance movement to intersect the can-cap stack and to shove the can-cap seating on the plate against the guide flange and to cause the cap to move outwardly between the pusher-bar and guide flange and to be projected into the recess on the cap receiving shoulder; the forward stroke of the pusher-bar terminating in spaced relation to the guide flange at a point to serve as a stop to prevent backward movement of the can-cap.

4. In a can-cap feeding mechanism, an oscillatory pusher-bar mounted to move back and forth toward and away from a stack of can-caps, and a cap separating blade on said pusher-bar projecting forward from the edge thereof and adapted to enter between a pair of superimposed caps before the pusher-bar strikes the lowermost cap, said blade having a knife edge one end of which protrudes to form an entering point and arranged to initially enter the stack of can-caps on the advance stroke of the pusher-bar.

5. In a can-cap feeding machine, an oscillatory pusher-bar, and a blade on the top of said bar projecting to one side thereof having an arcuate knife edge one end of which protrudes to form an entering wedge, said pusher-bar being mounted to traverse an arcuate path to one side of a stack of can-caps and arranged to intersect the stack of can-caps; the knife edge of the blade being so positioned relative to the bar and the caps that the wedge end of the blade will initially enter between the two lowermost can-caps of the stack and the blade follow with a slicing movement as it is advanced to separate the two lowermost can-caps, and the pusher-bar being arranged to shove the lowermost can-cap; and stationary means co-operating with the pusher-bar on advance of the latter to move the cap lengthwise of the pusher-bar.

6. In a can-cap feeding mechanism, an oscillatory pusher-bar, a blade on the top of said bar projecting beyond one edge thereof, said blade formed with an arcuate knife edge the inner end of which forms an entering wedge, and a stationary guide flange arranged to extend in spaced relation to the pusher-bar when the latter is in its advanced position.

7. In a can-cap feeding machine, a shaft, a collar on the shaft, a pusher bar through which the shaft slidably extends, said bar seating on said collar, a washer bearing on said bar, a nut screwed on said shaft for clamping the bar between the washer and collar, and a key on said shaft engaging the collar and the washer, said key having a notch spanning the bar to permit rotation of the latter on the shaft.

8. In a can-cap feeding machine, a can-

body carrier having a recess arranged to traverse an arcuate path of travel, a can-cap supporting plate, a stationary guide flange on said plate located to extend diagonally between a stack of can-caps on the plate and the can carrier, said guide flange terminating adjacent to the path of travel of the recess and extending diagonally in the direction of advance movement of the carrier, and an oscillatory pusher-bar adapted to shove a can-cap along said stationary guide flange and to eject it into the recess with a rolling motion.

RAY O. WILSON.
ARTHUR D. SUMNER.