June 12, 1945. W. J. LANDRY 2,378,090

CAN OPENER

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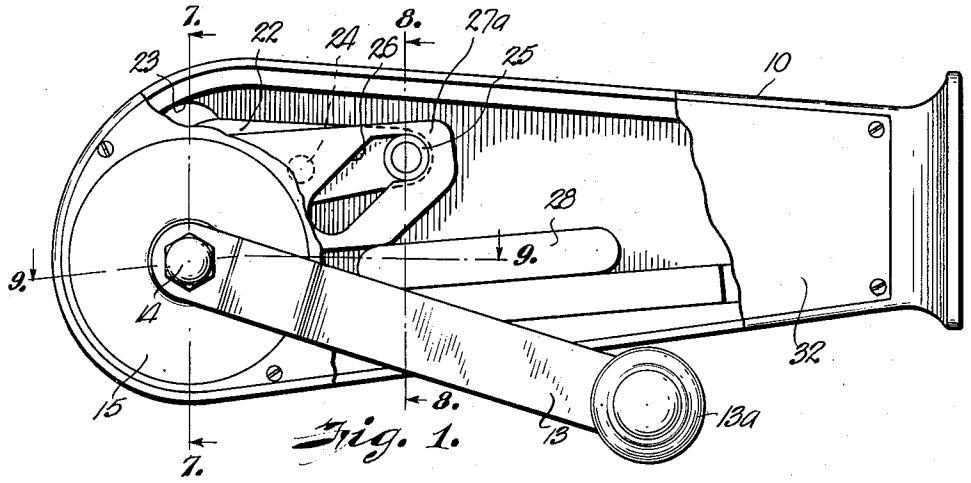


Fig. 1.

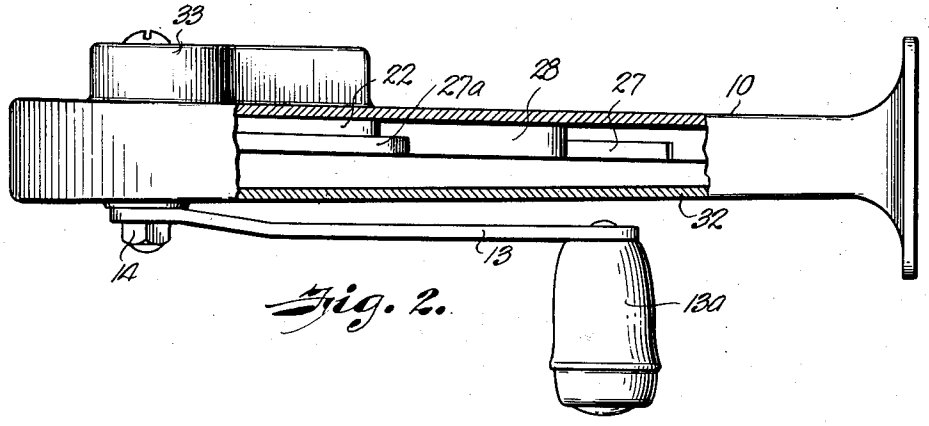


Fig. 2.

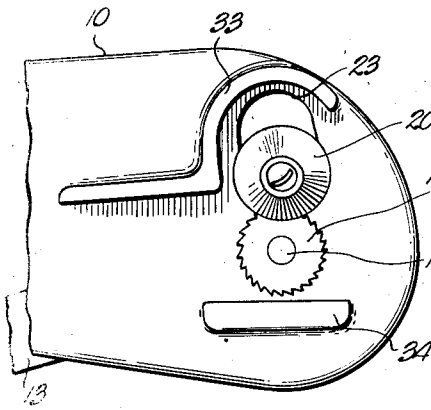


Fig. 3.

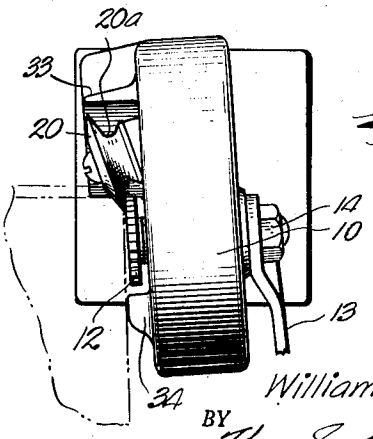


Fig. 4.

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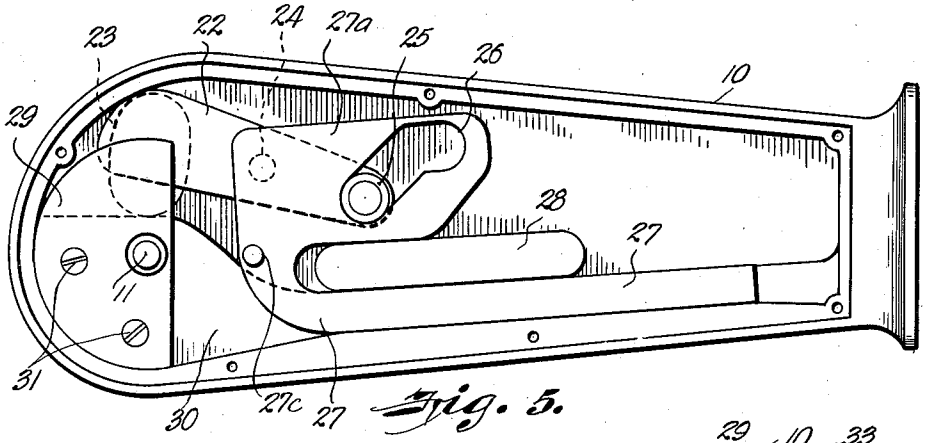


Fig. 5.

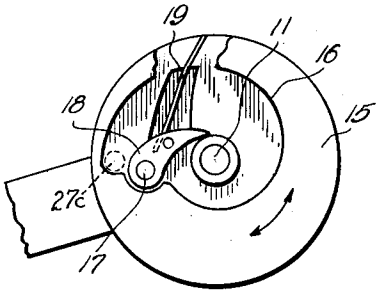


Fig. 6.

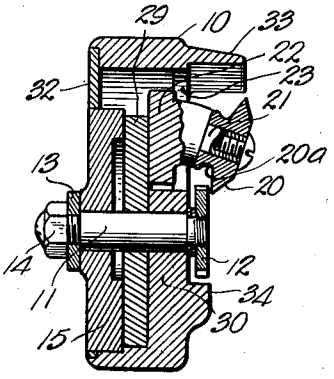


Fig. 7.

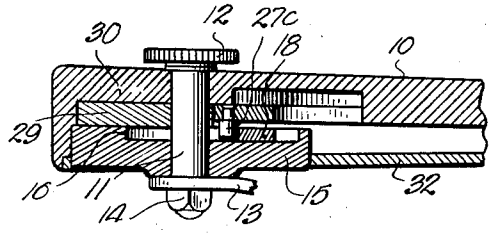


Fig. 9.

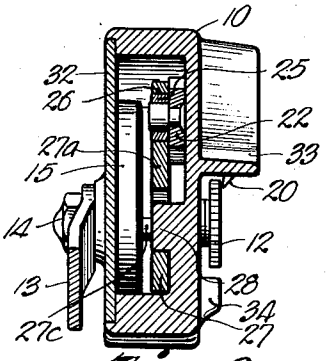


Fig. 8.

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UNITED STATES PATENT OFFICE

2,378,090

CAN OPENER

William J. Landry, Kansas City, Mo., assignor to John C. Hockery, Foster L. Talge, and Henry J. Talge, doing business as Rival Manufacturing Company, Kansas City, Mo.

Application September 4, 1944, Serial No. 552,596

6 Claims. (Cl. 30—15)

This invention relates to improvements in can openers and refers more particularly to a can opener construction in which the top is cut from the can by means of a rotating disk. This rotating disk is part of a cutter assembly comprising a feed gear and roller mechanism which engages the rim of the can and rotates the can while the disk cutter cuts the top from the can.

The salient novelty resides in a unique type of mechanism which includes coacting slidable and rotating cam members actuated by a manually operated handle to bring the feed gear and cutter into cutting relationship and maintain them in a cutting position during the cutting operation and to automatically separate, by reversal of the handle, the cutter from the feed gear after the cutting operation has been performed.

Among the important objects and advantages of the construction is its simplicity, ruggedness and adaptability for use on all types of cans.

In the accompanying drawings which form part of the instant specification and are to be read in conjunction therewith and in which the same reference numerals are used to indicate the same parts in the various views:

Fig. 1 is a side elevational view of the device with parts of the housing broken away,

Fig. 2 is a top plan with a part of the housing removed to show the arrangement of the actuating mechanism,

Fig. 3 is a fragmentary view of the end of the opener showing the cutting assembly,

Fig. 4 is an end view with the cutting assembly in position to sever the top from a can,

Fig. 5 is an elevational view with the housing plate and actuating handle assembly removed,

Fig. 6 is the detail of the rotating cam,

Fig. 7 is a sectional view taken along the line 7—7 in Fig. 1 in the direction of the arrows,

Fig. 8 is a sectional view taken along the line 8—8 in Fig. 1 in the direction of the arrows,

Fig. 9 is a sectional view taken along the line 9—9 in Fig. 1 in the direction of the arrows.

The can opener is preferably portable and is attached by screws or a fastener plate, not shown, in any convenient place in the house, restaurant or any establishment where it is to be used. The device consists of a housing 10 preferably manufactured by die casting of any suitable metal or plastic. Extending through the housing and bearing therein is a shaft 11. On one end of the shaft is feed gear 12 whose outer periphery is serrated in the form of teeth. On the opposite end of the shaft 11 is a handle 13 held in place by means of a nut 14. A knob 13a at the end of the handle facilitates its rotation. Also on the shaft 11 is fixedly mounted a disk cam 15, details of which are shown in Fig. 6. The disk may be pressed onto the shaft or fixed thereto by brazing. A key or pin, not shown, are other expedients for mounting the disk fixedly on the shaft is feed gear 12 whose outer periphery is and pivoted at 17 within the camway is a dog or latch 18, the free end of which is held against shaft 11 by means of a suitable spring 19.

A disk cutter 20 which forms a part of the cutting assembly with feed gear 12 is mounted upon a stub shaft 21. The axis of stub shaft 21 is disposed at an angle to the axis of shaft 11 and is extended from a lateral projection at the end of an arm 22 which is mounted within the housing 10. Stub shaft 21 extends through an opening 23 in the housing, as shown in Figs. 3, 5 and 7. The arm 22 which carries the cutter is pivoted at 24 and at its opposite end has a cam roller 25. Cam roller 25 is located and moves in a cam slot 26, formed in the upper portion 27a of a slide 27. This slide reciprocates in the housing and is held in place by means of a keeper 28, shown best in Figs. 1 and 5. This keeper is in the form of an elongated lug which fits in a slot 27b in the slide. Preferably, the keeper is integrally formed in the housing during the die casting operation. The slide 27 is positioned in the housing between the arm 22 and cam 15. Near the front edge of the slide is a pin 27c which projects from the face of the slide and fits in the camway 16 of the rotatable cam 15.

Within the housing and fixedly attached thereto are spacer members 29 and 30, the former held in place by screws 31 and the latter formed as a part of the housing. These spacers serve to properly position the pivoted arm 22, slide 27 and cam 15 within the housing. A removable plate 32 on the side of the housing holds the mechanism in place. Formed on the outside of the housing is a combination guide and protector member 33, the curved portion of this member, surrounding the upper part of the cutter, serving as a protector and the straight portion, extending longitudinally of the housing, serving as a guide for the can during the cutting operation. On the housing below the feed gear is an elongated ridge or protrusion 34, against which the can rests while it is being opened, as indicated in Fig. 4.

The actuating mechanism of the can opener is such that upon clockwise rotation of the handle 13 the feed gear and disk cutter are brought into cutting relationship and by reversing the

rotation of the handle the cutter and feed gear are automatically separated to permit positioning of the can adjacent the housing and cutting assembly preliminary to cutting the top from the can.

Explaining, first, the manner in which the feed gear and cutter are brought into cutting relationship and assuming that they are in the separated position, as shown in Fig. 5, with the cutter in a raised position. The pin 27c on slide 27 at this time is located in the camway 16 in the dotted line position shown in Fig. 6, or contacting the outer contour of the camway at the most remote position from the center of shaft 11. Slide 27 is at its extreme position toward the housing support in a location which, for convenience, is termed "rearwardly" of the housing. Roller 25 on arm 22 is at the front and lower end of camway 26. With the cutter and feed gear separated the side of the can is placed against rest 34 and adjacent to the face of feed gear 12, as shown in Fig. 4. The upper rim or flange of the can extends behind the disk cutter so that its top edge fits into the groove 20a behind the cutter. When the can is in this position the handle 13 is rotated in a clockwise direction. Cam 15 will rotate with shaft 11 causing pin 27c to follow the outer contour of camway 16 gradually reducing the distance between shaft 11 and the pin 27c moving slide 27 forwardly in the housing and roller 25 rearwardly in the camway 26. Due to the configuration of camway 26 arm 22 is rocked upon its pivot 24 to lower the cutter to a cutting position with respect to the feed gear. As the cutter is lowered with the can in position, as shown in Fig. 4, the lower edge of the can flange will be seated upon the outer serrated periphery of the feed gear and as the cutter descends inside of the flange it will pierce or stab the top of the can. The flange portion or rim of the can is simultaneously gripped tightly between the feed gear and grooved portion 20a behind the cutter.

Continued rotation of the handle in a clockwise direction rotates the feed gear and can. The disk cutter rotates with the feed gear cutting out the top of the can as the can rotates. During the cutting operation the slide is in a position shown in Fig. 1 reciprocated to a forward position in the housing. At this time pin 27c has moved to a location adjacent to and contacting the outer periphery of shaft 11. As the shaft 11 and cam 15 rotate during the cutting operation pin 27c will be continuously positioned immediately adjacent the outer periphery of shaft 11 as shown in dotted lines in Fig. 6 and with each rotation of the cam will pass beneath or snap by dog or latch 18 with the flexing of spring 19.

Describing now the manner in which the cutter and feed gear are automatically separated to remove the can from the opener after the cutting operation, handle 13 is reversed or rotated in a counterclockwise direction. With this rotation of the handle and shaft 11 upon which cam 15 is mounted, pin 27c will be lifted from the periphery of the shaft and ride upon the convex surface of the latch or dog 18. It is thus returned to its original position adjacent the contour of the camway most remote from the shaft 11 or to a position shown in dotted lines in Fig. 6. Since pin 27c is fixedly mounted upon the slide, shifting of the pin reciprocates the slide again to a position in the housing shown in Fig. 5 causing roller 25 on pivoted arm 22 to advance from the position shown in Fig. 1 to that shown in Fig. 5. This movement of the roller rocks the arm 22 from the cutting position, shown in Figs. 3 and 4, to the separated position, shown in Fig. 5. As the cutter is retracted from the feed gear the rim of the can is released from both the feed gear and roller portion 20a of the cutter.

From the description of the device and its operation it will be obvious that the construction is such as to afford a simple, easily operated, rugged mechanism which can be economically manufactured since most of the parts can be die cast and easily assembled. There are few operating parts in the device and these are of a substantial character. Parts subjected to operating pressures are rigidly mounted and have sufficient strength and flexibility to withstand long service.

From the foregoing it will be seen that my invention is one well adapted to attain all of the ends and objects hereinbefore set forth together with other advantages which are obvious and which are inherent to the structure.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the appended claims.

Having thus described my invention, I claim:

1. A can opener comprising a housing, transverse shafts mounted in said housing, a feed gear and actuating means on one shaft, a disk cutter on the other shaft, said cutter shaft carried by a pivoted arm, a slide having a camway reciprocable in the housing, a rotating cam on the first mentioned shaft, operable connections between the slide and rotating cam and the slide and pivoted arm, whereby rotation of the shaft upon which the feed gear and rotating cam are mounted moves the cutter and feed gear into cutting relationship and reversal of the rotation of said shaft separates the feed gear and cutter.

2. A can opener comprising a housing, transverse shafts mounted in said housing, a feed gear and actuating means on one shaft, a disk cutter on the other shaft, said cutter shaft carried by a pivoted arm, a slide having a camway reciprocable in the housing, a rotating cam on the first mentioned shaft, said slide having engagement with the rotating cam whereby rotation of the shaft upon which the feed gear and rotating cam are mounted moves the cutter and feed gear into cutting relationship and reversal of the rotation of said shaft separates the feed gear and cutter.

3. A can opener comprising a housing, transverse shafts mounted in said housing, a feed gear and actuating means on one shaft, a disk cutter on the other shaft, said cutter shaft carried by a pivoted arm, a slide having a camway reciprocable in the housing, a rotating cam on the first mentioned shaft, a member on said slide engaging the rotating cam, a pivoted latch in the rotating cam coacting with the member on the slide to move the cutter and feed gear into cutting relationship upon rotation of the feed gear shaft and maintain them in this relationship upon continued rotation of said shaft and adapted to automatically separate the cutter and feed gear upon reversal of its rotation.

4. In a can opener, a housing, a cutter assembly including a feed gear and a disk cutter adapted to be brought into cutting relationship and separated by rotation of an actuating handle, the improvement which resides in an actuating mechanism enclosed within the housing and adapted to

perform said operations, comprising a slidable cam, an arm upon which the cutter is mounted pivoted to the slidable cam and coacting therewith to raise and lower the cutter, a cam rotatable with the actuating handle and having engagement with the slidable cam to effect its reciprocation and actuation of the cutter arm.

5. A can opener as in claim 4 including a latch pivoted upon the rotatable cam engageable with and coacting with a pin on the slidable cam whereby the movement of the slidable cam is reversed and the cutter arm rocked in the opposite direction to effect separation of the cutter and feed gear when the actuating handle is rotated in a reverse direction.

6. A can opener as in claim 4 in which the slidable cam comprises a rigid portion and an elongated resilient portion connected by a narrow neck whereby resiliency of the slidable cam is transmitted from the cam to the cutter mounting through the pivoted cutter arm.

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