June 11, 1940. F. W. KUBLIN 2,204,368

CAN OPENER

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Fig. 1.

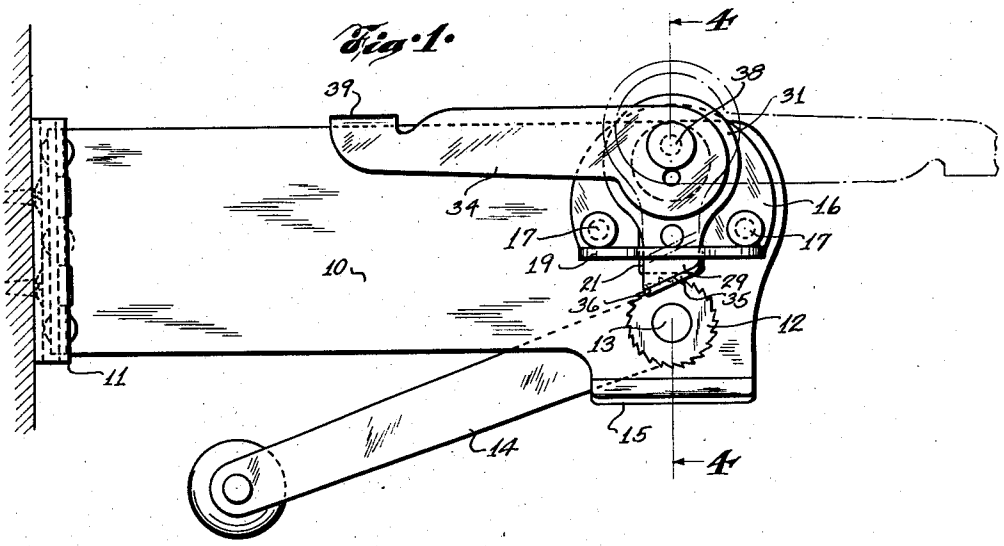


Fig. 3.

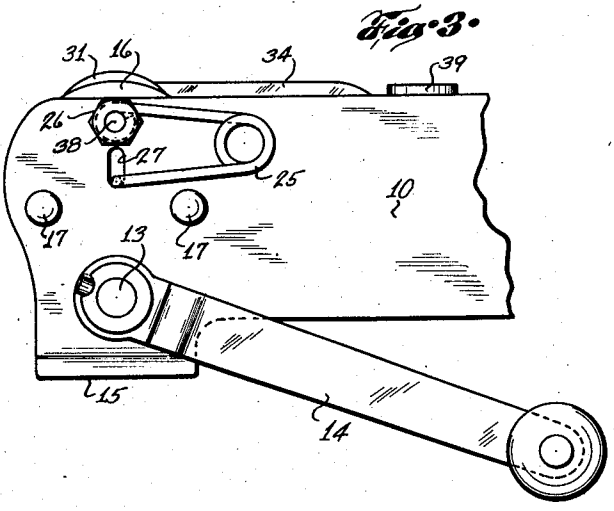
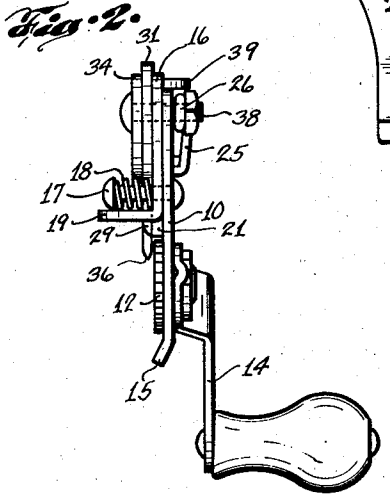


Fig. 2.



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Fig. 4.

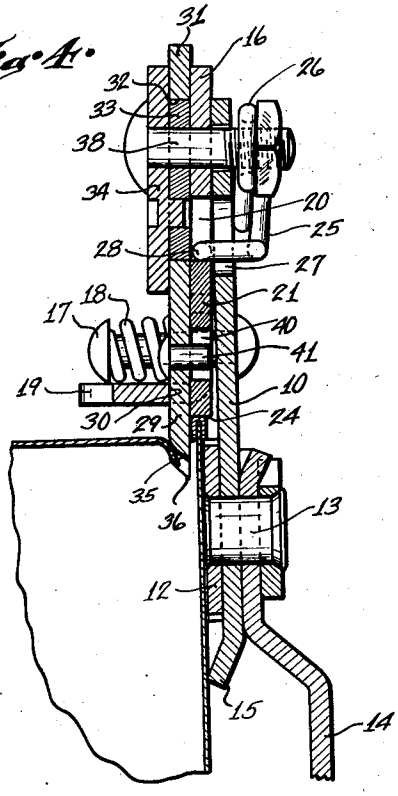


Fig. 6.

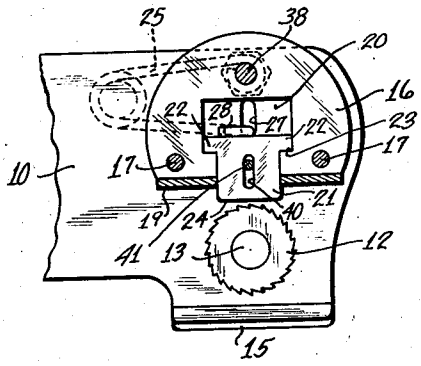


Fig. 5.

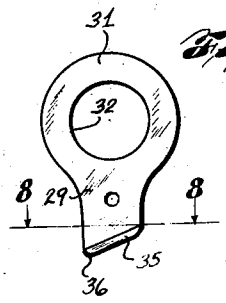


Fig. 7.

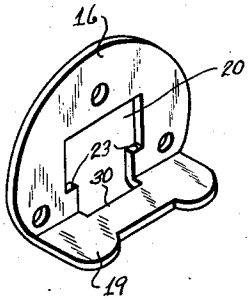
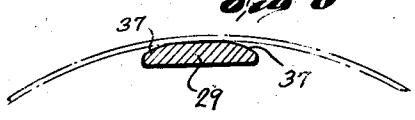


Fig. 8.



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Patented June 11, 1940 2,204,368

UNITED STATES PATENT OFFICE

2,204,368

CAN OPENER

Frederick W. Kublin, St. Louis, Mo., assignor to Dazey Churn & Manufacturing Company, St. Louis, Mo., a corporation of Missouri

Application June 26, 1936, Serial No. 87,353

13 Claims. (Cl. 30—15)

My invention relates to can openers, and more particularly to an improved can opener of the type employing a rotatable traction element which operates to move the can relative to a cutter, to cause severance of a can wall.

An object of my invention is to provide, in a device of this character, improved means for holding the can in operative engagement with the traction element while such element is functioning to move the can.

Another object of my invention is attained in the provision of an improved blade mounting which provides for latitude of blade movement to enable the blade to adjust itself to irregularities in a can wall and to pass over the same easily and smoothly, without increased manipulative effort by the operator.

Stated generally, my invention resides in the construction and novel arrangement of parts which make for simplicity and economy of manufacture and ease of operation, and provides a highly efficient can opener.

In the drawings, Fig. 1 is a side view of my improved can opener; Fig. 2 is an end view of the same; Fig. 3 is a view of the side of the device opposite to that appearing in Fig. 1; Fig. 4 is an enlarged sectional view taken at line 4—4 of Fig. 1; Fig. 5 is a side view of the blade; Fig. 6 is a side view of the device with the blade and blade-actuating lever removed to show the "hold down" element and guide plate for the same; Fig. 7 is a perspective view of the guide plate, and Fig. 8 is a sectional view of the blade taken at line 8—8 of Fig. 5, including a fractional representation of a can.

Referring now by characters of reference to the drawings, the operating mechanism is mounted near one end of an elongate base plate 10 which is provided at its opposite end with a suitable mounting means, indicated at 11, for securing the device to a wall or other support. The feed wheel 12 comprises a hardened steel disc having a toothed peripheral edge and is disposed on the front face, so-called, of the base plate 10, near outer and lower edges thereof. The feed wheel is secured to a shaft 13 which extends through and is journalled for rotation in the base plate. A crank 14 secured to the shaft serves as means for turning the feed wheel. Projecting angularly from the base plate subjacent the feed wheel is a lug 15 which is adapted to engage a side wall of a can and space the same from the front face of the feed wheel. Lug 15 also serves to stabilize the can during the cutting operation.

A guide plate 16 is disposed flatwise on the front face of the base plate above the feed wheel and is attached to the base plate in such manner as to be susceptible of limited movement toward and from the base plate. A pair of relatively spaced studs 17 project from the base plate through apertures in the guide plate and carry springs 18 which are compressed between the guide plate and enlarged head portions of the studs. The springs normally hold the guide plate flatly against the base plate yet flex to permit of restricted movement of the guide plate toward and from the base plate. An outwardly projecting horizontal flange 19 at the lower edge of the guide plate facilitates positioning a can between the blade and feed wheel, prevents undue angular displacement of the can during the opening operation, and serves as a guard for the blade.

The guide plate 16 is provided with a substantially T-shaped aperture 20 which accommodates the "hold down" element 21. The "hold down" or pressure element 21 is adapted to move vertically in the guide plate aperture, toward and from the feed wheel, and is provided with lateral projections 22 which engage shoulders 23 on the guide plate to limit the extent of downward travel of the pressure element. In the lowermost position of the pressure element, (see Fig. 6), the can engaging surface 24 thereof is slightly spaced above the uppermost teeth of the feed wheel.

The pressure element is urged downwardly by means of a spring 25 mounted on the rear face of the base plate. One end of the spring is suitably anchored to the base plate as at 26, and the other end, bent angularly, extends through a vertical slot 27 in the base plate and bears upon the pressure element 21. The end portion of spring 25 which engages the pressure element 21 is designated 28.

Fig. 5 illustrates the cutting element or blade 29 which is disposed flatwise on the guide-plate 16 facing the "hold down" element 21. The blade extends through a recess 30 (Fig. 7) in the guide plate flange 19, which recess is a continuation of the T-shaped aperture 20 into the flange 19. A head portion 31 on the upper end of blade 29 has a circular aperture 32, and journalled in the aperture 32 is a disc 33 which is fixedly secured, flatwise, to the inner face near one end of the blade actuating lever 34. The blade terminates downwardly in an oblique shearing edge 35, and a pointed end 36 for puncturing the can. Rounded edge surfaces 37 at the inner face of the cutting end (see Fig. 8) enable the blade to fit closely the inner cylindrical surface of a can wall, and have the additional purpose of providing cam-

ming surfaces, functioning in a manner to be hereinafter explained.

The lever 34 pivots on a shaft 38, constituted by a suitable bolt, which shaft extends eccentrically through the disc 33, and through guide plate 16 and base plate 10. The inner end of the shaft preferably projects beyond the rear face of the base plate to serve as an anchoring stud for the fixed end of the "hold down" spring 25. The aperture in the base plate through which shaft 38 extends is slightly larger than the shaft to permit the shaft and parts carried thereby to rock under the influence of an outwardly directed force on the blade. It will be readily understood that only a very small amount of lateral play in the shaft is necessary to permit of substantial lateral movement of the lower end of the blade. Such movement, of course, is opposed by the action of springs 18.

The lever 34 is adapted to be swung through an arc of approximately 180 degrees, and the two extreme positions of lever travel are shown in Fig. 1. When lever 34 is swung backwardly to bring the lug 39 into engagement with the upper edge of the base plate, the blade 29 is displaced, by the action of the eccentric disc 33, into its lowermost, or cutting position. When in cutting position the blade overlaps the front face of the feed wheel. Movement of lever 34 to the position thereof indicated by broken lines, (Fig. 1), raises or retracts the blade to its uppermost position wherein the blade lies clear of the feed wheel, permitting of the insertion or removal of the can.

The "hold down" element 21 is adapted to be raised and lowered concomitantly with like movements of the blade, and this result is accomplished by the means hereafter described. The element 21 is provided with a vertically extending slot 40, and the blade is provided with a finger 41 which projects into slot 40. When the blade is raised by the action of lever 34, finger 41, engaging the element 21 at the upper extremity of slot 40, causes the element 21 to be raised. When the blade is lowered to cutting position, element 21 likewise moves downwardly under the action of spring 25.

The described operative connection between the blade and "hold down" element 21 is of so-called "lost motion" character, the element 21 being free to move independently of the blade when the blade is disposed in cutting position. It will appear that spring 25, operating through element 21, tends to maintain the blade in cutting position, and consequently to maintain the lever 34 folded back compactly against the upper edge of the base plate.

The manner in which my improved can opener operates may be described as follows. Lever 34 is swung to the extended position indicated by dotted lines in Fig. 1 which causes the blade and "hold down" element to be drawn upwardly away from the feed wheel 12. The can to be opened is then inserted into the device by placing the upper rim or bead between the contact surface 24 of element 21 and the feed wheel. The under surface of flange 19 aids the user in guiding the can into the described position.

Lever 34 is now swung backwardly to its initial, folded position, causing displacement of the blade dowwardly into puncturing engagement with the can top at a point immediately adjacent the inner periphery of the bead. The element 21 also descends until it engages the upper surface of the can bead, and under the influence of spring 25 exerts pressure on the can bead which holds the same in frictional, operative engagement with the feed wheel.

Rotation of the feed wheel by means of the crank 14 causes the can top to be moved and sheared by the blade 29. The blade is constrained against the inner surface of the can bead by the springs 18 with the result that the can top is sheared close to the bead. No sharp lip or flange remains on the can to constitute a source of injury to the user. When the blade encounters a projection or other irregularity on the can bead, such as is produced at the seam in cans of conventional construction, the blade is forced outwardly by the camming action of such projection on the rounded sloping surface 37 of the blade. The spring-biased guide plate 16 yields to permit of such blade movement, and returns the blade to its normal cutting position after the projection has been moved beyond the blade.

The "hold down" element 21 likewise adjusts itself to irregularities in the can bead, and to cans having beads of varying height. Inasmuch as the element 21 is adapted to be displaced upwardly, independently of the blade, (such movement being opposed by spring 25), the element is capable of riding over a projection or irregularity on the bead without interrupting or otherwise interfering with the cutting action of the blade.

It may be readily comprehended that the described ability of the blade and "hold down" element to yield when encountering irregularities on the surface of the can renders the device easy and smooth of operation.

I have described and illustrated my invention with reference to a presently preferred embodiment thereof, but it is to be understood that various changes may be made in the parts and their arrangement herein described without departing from the spirit and full intended scope of my invention as defined by the appended claims.

I claim:

1. A can opener including a base, a feed wheel and means for turning the same, mounted on said base, a blade movable toward and from said feed wheel, a spring-biased pressure element adapted to engage a can and urge the same into frictional engagement with the feed wheel, said element being mounted on the base for movement, independently of the blade movement, in the direction of the plane of the feed wheel, and a lever operatively connected to the blade and pressure element for moving the same away from the feed wheel.

2. A can opener comprising a base, a feed wheel on said base, a spring-biased pressure element on said base movable toward and from the feed wheel in the direction of the plane thereof, a blade mounted for sliding movement on the base, means for moving said blade, and a lost motion operative connection between said blade and pressure element.

3. A can opener comprising a frame, a feeding roller having its axis of rotation fixed with respect to said frame, means for turning said feeding roller, a blade and a spring-biased, can-engageable pressure element mounted on said frame for movement in the direction of the plane of the feeding roller, said pressure element being adapted for movement independently of the movement of said blade, a lever for moving said blade toward and from the feed roller, and means connecting said pressure element for movement by said lever.

4. A can opener comprising a stationary plate,

a feed wheel and an actuating crank therefor mounted on said plate, a can-engageable pressure element and a blade independently mounted on the plate for sliding movement in the direction of the plane of the feed wheel, means operatively connecting said element and blade, a spring adapted to urge said element toward the feed wheel and a lever operatively connected to said blade adapted to move both the blade and the pressure element.

5. A can opener comprising a frame, a feeding roller mounted thereon, a blade, a lever for moving said blade toward and from the feeding roller, a spring-biased pressure element movable independently of the blade toward and from the feeding roller in the direction of the plane thereof, said pressure element being adapted to engage a can and hold the same in operative engagement with the feeding roller, and means operatively interconnecting the blade and pressure element whereby said lever is adapted to move both blade and pressure element in a direction away from the feeding roller.

6. In a can opener including a base member and a traction wheel mounted thereon, a blade mounted for movement toward and from the traction wheel, a pressure element adapted to hold a can in operative engagement with the traction wheel, said pressure element being mounted on the base member for movement toward and from the traction wheel in the direction of the plane thereof, means forming a lost-motion operative connection between the blade and pressure element, a manipulating lever for moving the blade and pressure element, and a spring for biasing the blade and presure element toward the feed wheel.

7. In a can opener including a base plate and a traction wheel for moving a can relative to the base plate, a blade movable toward and from the traction wheel, mounted on the base plate, a pressure element engageable with the can to hold the same in operative engagement with the traction wheel, means on the base plate mounting said pressure element for movement, independent of blade movement, toward and from the traction wheel in the direction of the plane thereof, means operatively connecting said blade and pressure element for effecting joint movement thereof, and a spring adapted to bias the blade and pressure element toward the traction wheel.

8. A can opener comprising a base member having means for attaching the same to a support, a traction wheel rotatably mounted on the base plate, a blade and a can-engageable pressure element independently mounted on said base for movement toward and from, and in the direction of the plane of said traction wheel, means for moving said blade as aforesaid, means operatively connecting said blade and pressure element and a spring mounted on said base adapted to urge the pressure element toward said traction wheel.

9. In a can opener including a base plate and a traction wheel for moving a can relative to the base plate, a blade mounted for movement toward and from the traction wheel, a pressure element adapted to hold a can in operative engagement with the traction wheel, said pressure element being mounted for movement, independent of blade movement, toward and from the traction wheel in the direction of the plane thereof, a lever operatively connected to the blade and pressure element, and a spring operatively associated with said blade and pressure element, adapted to bias the blade and pressure element toward the traction wheel.

10. In a can opener including a base having a traction wheel rotatably mounted thereon, a guide plate yieldingly mounted on said base for limited movement in the direction of the axis of the traction wheel, a blade mounted on said guide plate for movement relative thereto in the direction of the plane of said traction wheel, means for effecting blade movement as aforesaid, and a spring coacting with said guide plate to oppose movement of the blade axially away from the traction wheel.

11. In a can opener including a base having a traction wheel rotatively mounted thereon, a guide plate yieldingly mounted on said base for limited movement in the direction of the axis of the traction wheel, a blade mounted on the guide plate and constrained for movement relative thereto toward and from, in the direction of the plane of the traction wheel, and a spring opposing movement of said guide plate.

12. In a can opener including a base having a traction wheel rotatively mounted thereon, a guide member yieldingly mounted on said base for limited movement in directions parallel to the axis of the traction wheel, a blade and a can-engageable pressure element constrained by said guide member for movement relative thereto in the direction of the plane of the traction wheel, actuating means for said blade and pressure element, and resilient means biasing said guide member and said pressure element toward said traction wheel.

13. In a can opener including a base having a traction wheel rotatably mounted thereon, a guide plate yieldingly mounted on said base for limited movement in directions parallel to the axis of the traction wheel, a blade and a can-engageable pressure element constrained by said guide plate for movement relative thereto in the direction of the plane of the feed wheel, means forming a lost-motion operative connection between said pressure element and blade, actuating means for said blade, a spring biasing said pressure element toward said traction wheel, and a spring biasing said guide plate toward said base.

FREDERICK W. KUBLIN.