May 21, 1929. H. J. EDLUND 1,713,823

CAN OPENER

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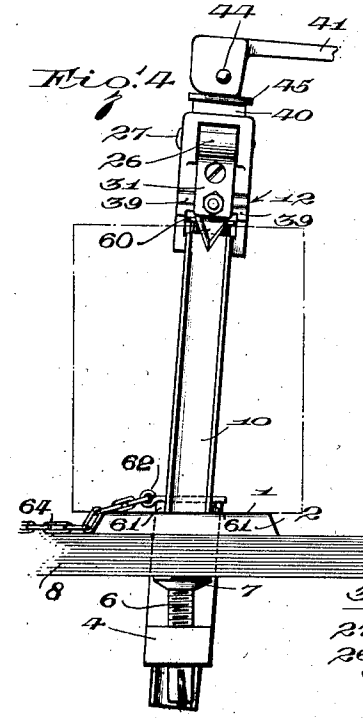


Fig. 4.

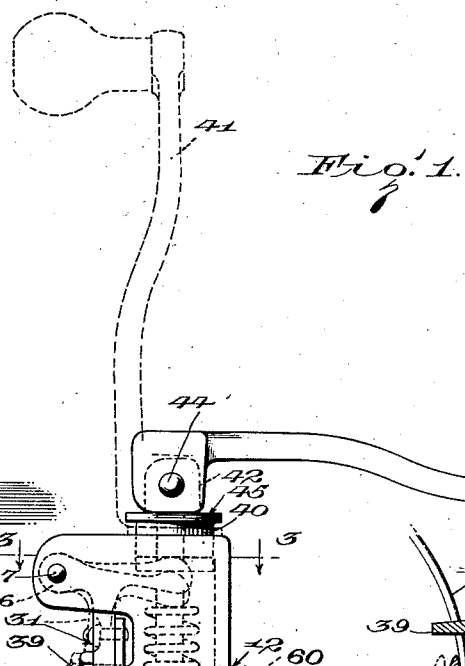


Fig. 1.

Fig. 2.

Fig. 3.

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Fig. 5.

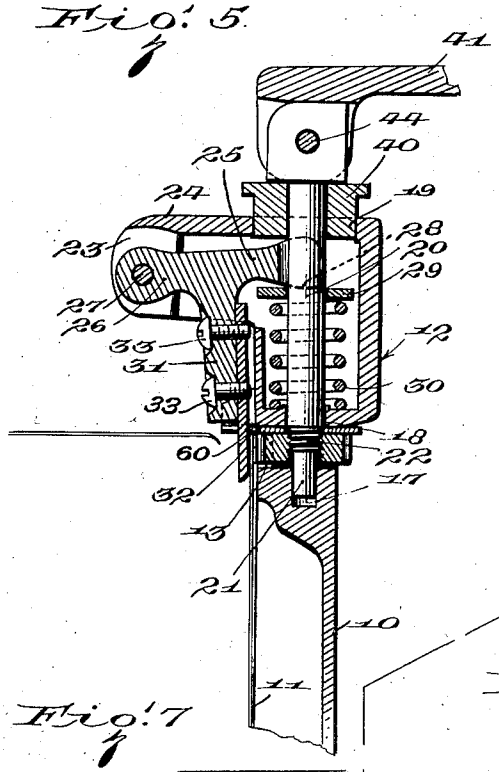


Fig. 6.

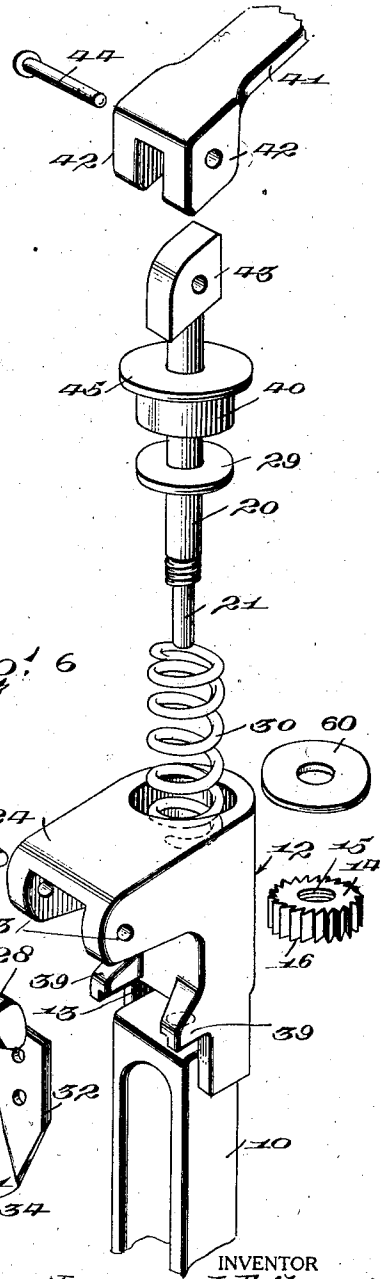
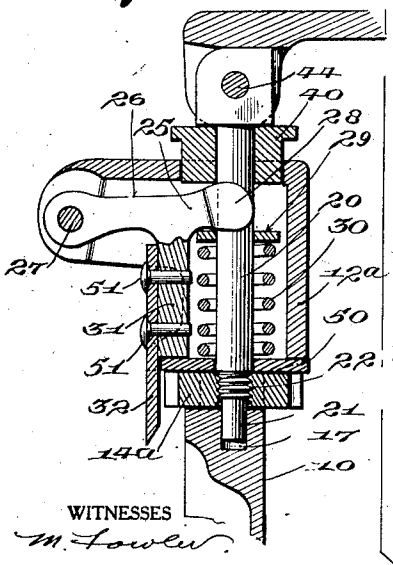


Fig. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY J. EDLUND, OF BURLINGTON, VERMONT.

CAN OPENER.

Application filed December 8, 1927. Serial No. 238,626.

This invention relates to can openers of that type which affords facilities for rotating a can on a substantially horizontal support in contact with a pendant cutting blade to effect cutting of the can top.

Can openers of the type referred to have been provided with vertically adjustable standards associated with the horizontal members for supporting the cans, the standards carrying the blades for cutting the tops of the cans. Heretofore, it has been proposed to feed the cans to the cutting blades by means of a plurality of cooperative toothed rollers or wheels arranged in a single can opener to engage with spaced portions of the can body so that actuation of the feed rollers or wheels of the can opener will turn the can with the top of the can in contact with the cutting blade.

The present invention contemplates the provision of a horizontal supporting plate on which a can may rest and a standard associated with the can supporting member and movable along a line which is inclined slightly from the vertical, the standard carrying a cutting blade for piercing and cutting the can top and for rolling the edge that is provided by the cutting action of the blade in the can top so that the edge of the opening defined by the cut will be continuously smooth, together with a single rotor turnable about the axial line of the standard and having teeth in its edge extending parallel to the axial line of the standard for engaging with the outer wall of the body of the can adjacent to the upper end of the can and for not only causing turning of the cam on its support but also for feeding the can top to the cutting blade when the rotor is turned. The improved can opener also includes, simple, easily operable and positively acting means for operating the rotor and for actuating the cutting blade supporting means of the device so that the cutting blade will be caused to pierce the can top at a point somewhat removed from the marginal edge of the can top and then will be moved into cutting engagement with the can top nearly to the marginal edge of the can top, whereby the entire top of the can will be removed when the can has been rotated through 360° in engagement with the cutting blade.

This invention will be best understood from a consideration of the following detailed description in connection with the accompanying drawings; nevertheless it is to be understood that the invention is not confined to the disclosure being susceptible of such changes and modifications as shall define no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:—

Figure 1 is a vertical section of a can opener constructed in accordance with the principles of my invention,

Figure 2 is a horizontal section taken along the line 2—2 of Fig. 1.

Figure 3 is a horizontal section taken along the line 3—3 of Fig. 1,

Figure 4 is a rear view in elevation of the can opener,

Figure 5 is a fragmentary vertical section of the cutting mechanism per se,

Fig. 6 is a view in perspective of the can opener showing the parts in detached relation,

Figure 7 is a fragmentary vertical section similar to Fig. 5, and showing a modified form of the device.

The improved can opener includes a bracket which comprises a plate 1 formed with an integral downwardly inclined marginal flange 2 which is joined integrally at one end of the plate 1 to the upper end portion of a sleeve 3. The sleeve 3 has the lower end portion thereof formed with a laterally extending lug 4 which underlies a portion of the plate 1 and is formed with a vertical opening 5 having a screw threaded wall for engaging with a clamping screw 6. The clamping screw 6 carries a clamping disk 7 at its upper end for engaging with the under surface of the extending edge portion of the table top 8 or like horizontal support, whereby when the screw 5 is tightened and the flange 2 of the plate 1 rests upon the upper surface of the table 8, the plate 1 will be secured in horizontal position on the table 8 and will be held against movement relatively to the table 8 while the sleeve 3 will be supported at the edge of the table. The can opener can also be fastened to a wall.

The bore 9 of the sleeve 3 constitutes a guiding and retaining opening in which a post 10 may slide longitudinally, the post 10 being non-circular in cross sectional contour and the bore 9 being correspondingly configured in cross section so that the post 10 will be held against turning about its longitudinal axis in the bore 9. It is to be ob-

served at this point that the bore 9 is inclined slightly from the vertical in a plane which is substantially tangent to the body of a can 11 when the latter is disposed on the plate 1 close to the post 10, as shown in Figs. 1 and 4, the inclination of the post 10 being slightly toward the right hand side of Figure 4, as shown in greatly exaggerated form in that view.

The post 10 is joined integrally or otherwise at its upper end to a housing 12, the lower end portion of which is formed to provide a transverse chamber 13. The chamber 13 is open at the side of the housing which is nearest to the can 11 and may also be open at its opposite side as shown. A rotor 14 is a disk having a screw threaded axial bore 15 and teeth 16 in its periphery. The teeth 16 extend parallel to the axis of the rotor 14 and have the walls thereof lying in planes which extend obliquely to radii of the rotor 14 so that these teeth will positively engage the body of the can 11 in such manner as to impart a turning movement to the can when the rotor 14 is turned in a clock-wise direction with the periphery thereof in contact with the upper end portion of the body of the can 11.

The housing 12 has a socket 17 formed in the bottom wall of the chamber 13 and also has an opening 18 in the top wall of the chamber 13 in alignment with the socket 17 and a larger opening 19 in the top wall of the housing 12 in alignment with the opening 18 and the socket 17. A shaft 20 extends through the openings 19 and 18 and has a reduced lower end portion 21 journaled in the socket 17, this reduced lower end portion extending through the bore 15 of the rotor 14 and being provided for part of its length with screw threads 22 engaged with the screw threaded wall of the bore 15 of the rotor so that rotation of the shaft 20 about its axis will cause a like movement of the rotor 14. The rotor 14 protrudes from the chambers 13 at the side of the housing 12 which is nearest the side of the can 11. The housing 12 has the upper end portion thereof formed to produce a lateral extension at the same side of the post 10 as the plate 1. This lateral extension comprises a pair of horizontally spaced ears 23 and an upper web portion 24. As best seen in Fig. 4, the space within the upper part of the housing 12 is in open communication with the space between the ears 23. An arm 25 of a bell-crank lever 26, which is fulcrumed on a horizontal pin 27 that is supported at its ends in aligned openings in the ears 23, extends into the space within the upper part of the housing 12. The arm 25 has forks 28 at its inner end adapted to slidingly embrace the upper end portion of the shaft 20 and to rest upon a washer 29 which slides on the shaft 20. An expansion spring 30 of coil formation encircles the shaft 20 between the washer 29 and the top wall of the chamber 13 and urges the washer 29 and the arm 25 of the bell-crank 26 upwardly within the space in the upper part of the housing 12.

The other arm of the bell crank lever 26 is indicated at 31 and depends alongside the housing 12 at the same side of the post 10 as the plate 1 nearly to the level of the rotor 14. The arm 31 carries a pendant cutter blade 32. Screws 33 or other fastening means secure the blade 32 flatwise against the wall of the arm 31 that is nearest to the housing 12 so that the cutter blade 32 will depend between the arm 31 and the housing 12 below the lower end of the arm 31 and below the level of the rotor 14. The depending lower end portion of the cutter blade 32 tapers to a sharp point at 34 and has oppositely beveled side edges so that the blade can be reversed from side to side on the arm 31 when one of such edges has become dull. The blade 32 is adapted to pierce the top of the can 11 at a slight distance from the marginal edge of the can top and when the bell-crank lever has been actuated in a manner which will be presently described, the cutting blade will move radially of the can in cutting engagement with the can top almost to the marginal edge of the can top so that the can top will be cut substantially along its marginal edge when the can is rotated in engagement with the cutting blade.

A pair of ears 39 extend from the housing 12 in straddling relation to the lower end portions of the cutting blade 32 and the arm 31 and tend to prevent edgewise swinging movement of the arm 31 without any appreciable stress being imposed on the pivot element 27 on which the bell crank 26 is fulcrumed. A probably more important function of the ears 39 is to serve as a stop for engaging with the upper edge of the can which is being turned in engagement with the blade 32 by reason of the operation of the rotor 14, whereby the can will be maintained in a desirable position during the operation of the device.

A sleeve plunger 40 has a slightly reduced portion reciprocable in the opening 19 and bears at its lower end on the forks 28 of the arm 25 of the bell crank, such forks preferably having rounded extremities, as shown. A crank handle 41 has a pair of spaced cam ears 42 straddling an upstanding lug 43 on the shaft 20 at the upper end of the latter. The cam ears 42 are pivotally attached to the lug 43 by a horizontal pivot pin 44, and bear against the top of the plunger 40. When the crank handle 41 is in the position indicated by the dotted lines in Figure 1, the cam ears 42 will hold the plunger 40 at the limit of its downward movement against the action of the expansion spring 30 and the arm 31 of the bell

crank and the cutting blade 32 will be disposed in the positions indicated by the dotted lines in Fig. 1 or in other words at the limit of their swinging movement away from the housing 13 and rotor 14. A flange 45 at the upper end of the plunger 40 serves to produce a relatively large bearing surface on the plunger for the cam ears 42.

In use, the can which is to be opened is placed on the plate 1 with the upper end portion of the body thereof in contact with the teeth 16 on the periphery of the rotor 14 and with the shank of the blade 32 bearing against the can top at a slight distance from the marginal wall of the can top, the crank handle 41 being in its raised position at this time. A slight blow or pressure on the top of the handle will cause the cutting blade to penetrate the can top. The handle 41 then is swung from the dotted line position of Figure 1 downwardly to the full line position of Figures 1 and 4 and the pressure on the plunger 40 will be relieved so that the spring 30 will be permitted to function to cause upward movement of the plunger and consequent movement of the cutting blade radially outward in cutting engagement with a can top nearly to the marginal edge of the latter. This outward movement of the cutting blade also will tend to force the upper end portion of the can body firmly against the teeth of the rotor 14. Manipulation of the handle 41 to cause rotation of the shaft 20 and the rotor 14 will cause the can to be turned on the plate 1 in engagement with the cutting blade and the entire can top will be removed by the action of the cutting blade. Since the post 10 is inclined slightly from the vertical, the rotation of the rotor 14 in a clockwise direction with the teeth thereof in engagement with the upper end portion of the body of the can 11 will not only rotate the can 11 but will tend to feed the can upward to the blade. It will be understood that the post 10 slides freely in the bore of the sleeve 3 so that the mechanism at the upper end of the post and the post can be raised as a unit to permit a can to be placed on the plate 1 or removed therefrom when desired. Cans of various sizes, shapes and constructions can be opened by means of the device quickly, easily and in a uniform manner.

The slightly modified construction which is exhibited in Figure 7 includes a washer 50 which is disposed on the shaft 20 in superimposed relation to a rotor 14^a. The latter is identical in essential respects with the rotor 14. The washer 50 is of greater diameter than the rotor 14^a and extends beyond the periphery of the rotor underneath the lower end of the depending arm 31 of the bell crank 26. The blade 32 is secured at 51 against the outer face of the arm 31 of the bell crank and of course, depends below the arm 31. The expansion spring 30 may bear at its lower end against the washer 50 and pressed upward on the washer 29 on which the forks 28 of the arm 25 of the bell crank 26 rests. The spring 30 thus will function to swing the arm 31 inward until the depending lower end portion of the blade 32 contacts with the adjacent edge of the washer 50 which thus serves as a stop for keeping the cutting blade at a desirable distance from the rotor 14^a. The same reference characters have been used to designate like parts of the two forms of the device. The housing at the upper end of the post 10 is practically the same as the housing 12 but has been designated 12^a since it is shown as being slightly different in minor details from the housing 12. The operation of the form of the device exhibited in Figure 7 is identical in essential respects with the operation of the first form of the device.

A disk 60 is mounted on the shaft 20 below the housing 12 and in contact with the rotatable element 14. This desk or washer is made of steel and slightly greater in diameter than the roller in order to permit the knife blade to rest on the periphery of the washer, providing the necessary clearance between the knife and roller. The washer revolves when the handle is operated so that in whatever position the handle is stopped the knife will fall to rest on the periphery of the washer, thereby leaving the proper clearance.

Bumpers 61 are mounted in the marginal flange 2 and in close association with the side walls of the movable shaft 10 and upon which are adapted to rest the pins 62 received within any one of a number of perforations 63 in the member 10. This provides for a support for maintaining the standard 10 in a predetermined position when the knife blade 32 has penetrated the top of the can and the handle 41 is being operated. A chain 64 is connected to any fixed part of the mechanism and also to the pins 62 to prevent loss of the same.

I claim:—

1. A can opener comprising a table having a passage inclined to the vertical, a post slidably mounted in the passage, a housing carried by the upper end of the post, a pivotally mounted cutting blade in the housing, a rotor having teeth in the periphery thereof supported on the post, a washer associated with the rotor for maintaining the cutting blade in spaced relation with the teeth of the rotor, and means for rotating the rotor, the edges of the teeth being inclined at an angle to the vertical.

2. A can opener comprising a table having a passage inclined to the vertical, a post slidably mounted in the passage, a housing carried by the upper end of the post, a pivotally mounted cutting blade in the housing, a ro-

tor having teeth in the periphery thereof supported on the post, a washer associated with the rotor for maintaining the cutting blade in spaced relation with the teeth of the rotor, means for rotating the rotor, the edges of the teeth being inclined at an angle to the vertical, bumpers mounted in close association with the post, a pin carried by the post adapted to rest on the bumper for maintaining the post in a predetermined position.

3. A can opener comprising a post, a pendant cutting blade carried by the post laterally of the upper end portion of the post and adapted to pierce and cut the can top, and a rotor carried by the post in position to engage with the body of the can adjacent to the upper end of the latter and on rotation to turn the can in engagement with the cutting blade and to feed the can top to the cutting edge of the blade, teeth on the rotor extending parallel to the axis of rotation of the rotor and the axis of the post and a device for adjustably supporting the post so that the axis will be inclined slightly from the vertical and the teeth will engage with the can to feed the can upward toward the cutting edge of the blade as the can is rotated.

HENRY J. EDLUND.