Feb. 5, 1935. I. JEPPSSON 1,989,807

CAN OPENER

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Fig. 1

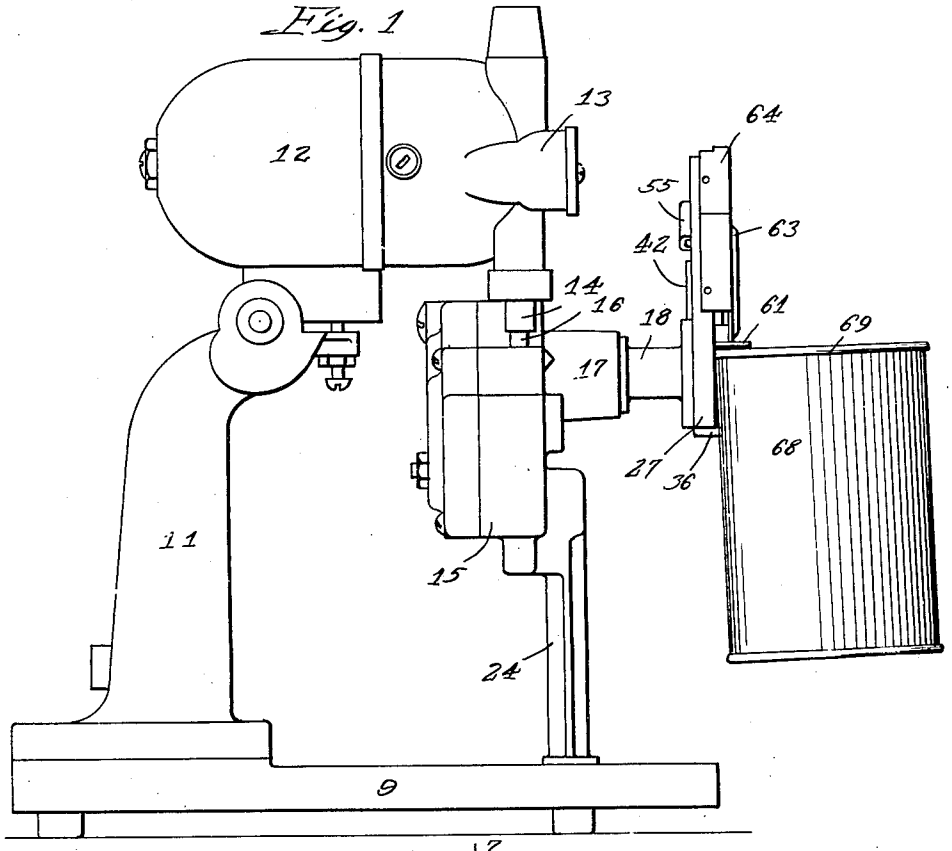


Fig. 2

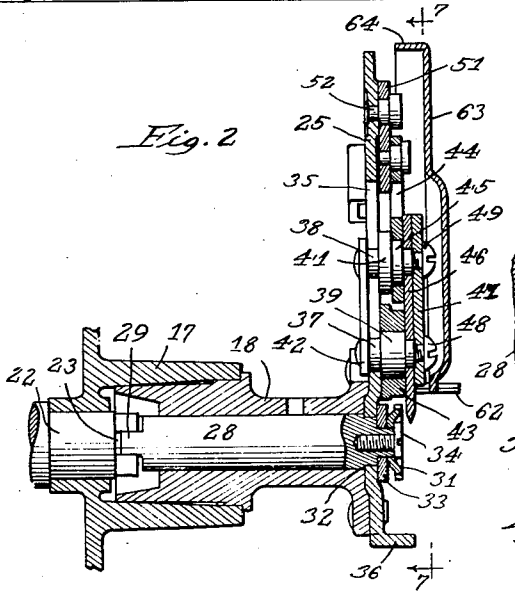
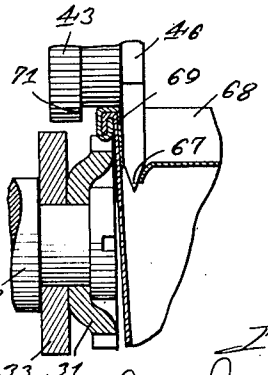


Fig. 3



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Fig. 4

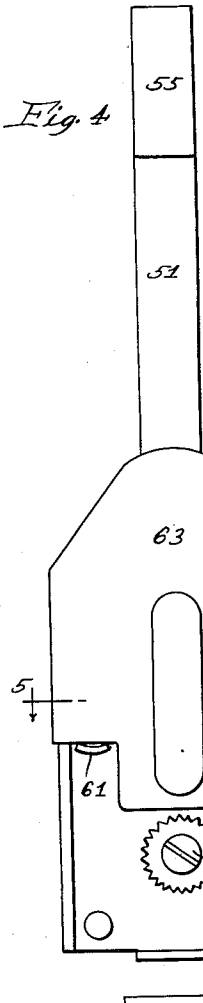


Fig. 6

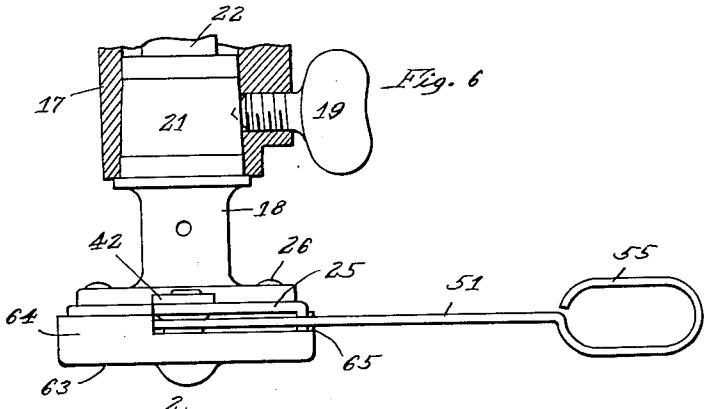


Fig. 7

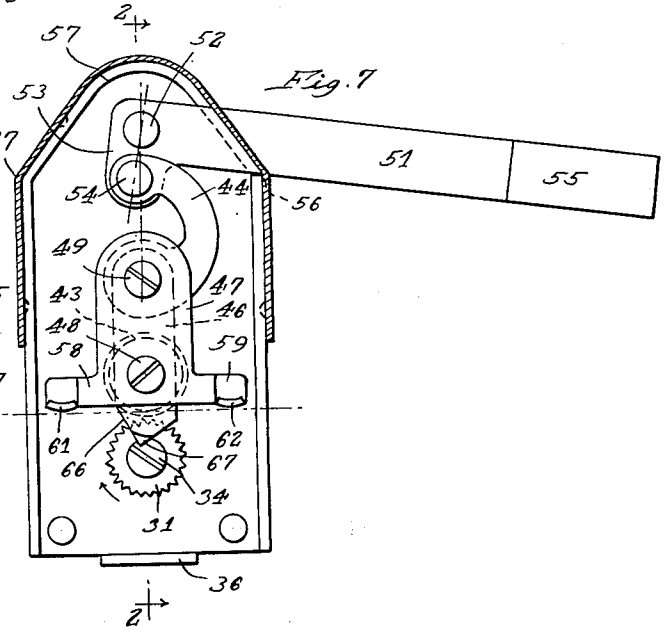
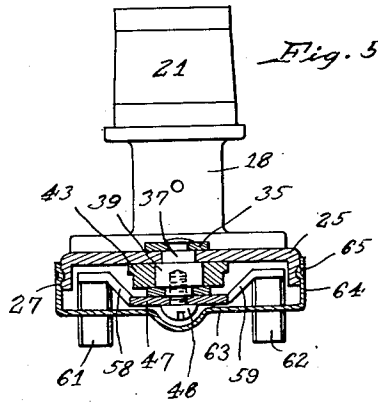


Fig. 5



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Patented Feb. 5, 1935 1,989,807

UNITED STATES PATENT OFFICE

1,989,807

CAN OPENER

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Application October 31, 1932, Serial No. 640,412

12 Claims. (Cl. 30—3)

This invention relates to can openers and has particular reference to a can opener attachment for use on household mixing machines.

An important object of the invention is the provision of a generally improved can opener and one adapted to be driven from the motor of a household mixer having a body portion arranged to be supported from the mixer provided with a feeding roller driven therefrom together with cutting mechanism constructed to be movable from an inoperative position to an operative cutting position and to retain such position during the cutting operations.

A further object of the invention is the provision of means for maintaining a can to be opened against the feeding mechanism with yielding pressure.

I have also aimed to provide a can opener having a plate, a rotatable feeding roller, and a knife and pressure roller movable as a unit toward and away from the feeding roller together with a handle and toggle mechanism between the handle and the unit to bring about such movement and to hold the cutting and pressure roller in proper relation for cutting.

A still further object of the invention is the provision of a can opener wherein the feeding roller and the cutter are so arranged with respect to each other as to improve the cutting characteristics of the can opener.

Another object is the provision of improved mechanism for moving a cutter into and out of its cutting position, the provision of improved means for maintaining the cutter in its operative position, improved means for holding the can against the feeding roller, and improved means for maintaining the can in an upright position during the cutting operation.

Other objects and attendant advantages will become apparent from the following description and the accompanying drawings, in which—

Figure 1 is a side elevation of a household mixer showing the can opener attachment in position and a can in position to be opened;

Fig. 2 is a section on the line 2—2 of Fig. 7;

Fig. 3 is a fragmentary enlarged view of the feeding roller, pressure roller and the knife showing the manner in which they cooperate in cutting the top from a can;

Fig. 4 is a front elevation of the can opener attachment;

Fig. 5 is a section on the line 5—5 of Fig. 4;

Fig. 6 is a top view of a can opener attachment showing a portion of the gear box in section, and

Fig. 7 is a section on the line 7—7 of Fig. 2.

The form of the invention shown in the drawings contemplates a can opener suitable for use with a mixer such as shown and described in the copending application of John W. Lynch, Serial No. 618,975, filed June 23, 1932, the numeral 9 designating the base of the mixer, the numeral 11 designating the upright, and the numeral 12 the driving motor of the mixer. The forward end of the motor 12 is provided with a gear box 13 having depending spindles 14. In the present embodiment of the invention a gear box 15 is positioned upon the base 9 and is provided with a shaft 16 arranged to replace one of the beater shafts of the mixer, the gear box being shown and described in further detail in my copending application, Serial No. 628,625, filed August 13, 1932, and entitled "Kitchen utensil". The gear box 15 is provided with a boss 17 to receive the shank 18 of the can opener which is secured therein by means of a wing screw 19 receivable in a depression in the shank. The shank is provided with a bearing portion 21 shaped for reception in the boss 18 to support the can opener on the mixer. The gear box is also provided with a driving shaft 22 which extends through the walls of the gear box within the boss 17 and is provided at its outer end with a slot 23 forming a groove of a tongue and groove connection. The gear box 15 is provided with a leg 24 arranged to be supported on the base 9 in the manner described in the above mentioned application. A plate 25 is fixedly secured to the shank 18 through rivets 26 and has its edges bent to an angle of 90° to provide outwardly extending side edges 27 which serve to reinforce and stiffen the plate. A shaft 28 is positioned in the shank 18 and is provided with a tongue 29 at one end receivable in the groove 23 and the shaft 22 for the purpose of driving a toothed feeding roller 31. The shaft 28 extends through the plate 25 and is provided with shoulders 32 bearing against the rear of the plate and a washer 33 at the front side thereof, the feeding roller 31 and washer 33 being secured to the shaft by means of a screw 34. The plate 25 is also provided with a longitudinal slot 35 intermediate its ends and with an outwardly extending tongue 36 at its lower end, the tongue being arranged to serve in positioning the can to be opened. Pins 37 and 38 are positioned in the slots 35 in spaced relationships and are provided with shoulders 39 and 41 arranged to bear against the front side of the plate 35. They are riveted to a plate 42 bearing against the rear side of the plate 25. A pressure roller 43 is rotatably positioned

on the enlarged portion 39 of the pin 37 and an arcuate toggle link 44 is rotatably positioned on a pin portion 45 of the pin 38, which portion is of slightly smaller diameter than the portion 41 of the same pin. A cutter 46 is positioned on the pins 37 and 38 outside the portions 39 and 45 while a guide plate 47 is secured to the outer or front ends of the pins 37 and 38, and serve to hold the cutter 46, the pressure roller 43 and the toggle 44 in position by tension of the screws 48 and 49 screwed into the front end of the pins 37 and 38 and bearing against the ends of the pins. The mechanism mounted on the pins 37 and 38 form the cutter unit, the unit being movable toward and away from the feeding roller 31 by movement of the pins in the slot 35.

Movement of the cutter unit is brought about by a lever 51 pivotally supported upon the plate 25 by means of a rivet 52, the lever having a bell crank 53 which is pivotally secured to the upper end of the toggle link 44 by means of a pin 54. The outer end of the lever is given a curved shape as shown at 55 to facilitate the manual rotation of the lever. Likewise the outwardly extending side edges 27 are cut away so that the lever may lie and operate in contact with the inner surface of the plate 25 between its positions. The inoperative position of the lever is shown in Fig. 4, while the operative or cutting position thereof is shown in Fig. 7. The two positions of the lever 51 are determined by the extremities of the opening in the outwardly extending side edges 27, that is, in the operative position the handle comes in contact with the upper end 56 of one of the side edges, and in the inoperative position it comes against the end 57 of the other side edge. The ends 56 and 57 thus determine the limit of movement of the handle. Referring to Fig. 7, it will be seen that when the handle 51 is moved into its operative position the upper end of the toggle 44 is moved through center, that is, the center line of the rivet 54 is moved slightly beyond the line joining the centers of the rivet 52 and the screw 49. As a result of this position the lever cannot be rotated back into its inoperative position by upward pressure against the cutter unit and therefore in order to move the cutter unit in a direction away from the feeding roller it becomes necessary to manually move the lever 51.

The guide plate 47 is provided with laterally and rearwardly extending arms 58 and 59 and with outwardly extending fingers 61 and 62, the fingers being adapted to bear against the rim of a can when the can is positioned in the opener for the purpose of preventing the can from tipping during the opening operation. The outwardly extending tongue 36 further serves to properly position the can in the opener by causing the can to be tipped slightly in a plane at right angles to the plate 25 so as to prevent the feeding roller 31 from bearing against the side surface of the can on its lower side. This effect is shown in Fig. 2 in which it will be seen that the side wall of the can slopes away from the feeding roller from top to bottom.

A cover plate 63 having flanged side edges 64 is arranged to be snapped over the front side of the opener to partially conceal the cutter unit and toggle mechanism, the flanged edges 64 having detents 65 arranged for reception into sockets in the side edges 27 of the plate 25 to maintain the cover in position. The flanged side 64 is also provided with a slot 65 for the operation of the lever 51.

A feature of the invention lies in the fact that the cutting edge 66 of the cutter 47 lies in a plane forward in the rotation of the feeding roller from the vertical center line therethrough, as best shown in Fig. 7. As a result of this construction, the feeding roller has a tendency to lift the can against the cutter, thereby facilitating the cutting operation. The lower end of the cutter is also pointed as shown at 67 to facilitate the piercing of the can cover at the start of the cutting operations.

In operation, a can such as shown at 68 (Figure 1), is positioned in the opener by placing the bottom of the rim 69 of the can against the top of the toothed feeding roller 31, as shown in Fig. 3. The lever 51 is then rotated from the position shown in Fig. 4 to the position shown in Fig. 7, whereupon the cutting unit is moved toward the feeding roller. During this movement the point 67 of the knife 46 pierces the top of the can directly adjacent the side wall of the can. As the lever 51 reaches its operative or cutting position the pressure roller 43 comes into contact with the upper edge of the rim 64 forcing it against the feeding roller and causing the teeth of the latter to bite into the rim. A flange 71 on the pressure roller keeps the rim from moving too far back and away from the cutter. At the same time the fingers 61 and 62, the lower sides of which rest in a plane slightly above the lower extremity of the pressure roller, come into contact with the rim of the can at spaced points so as to prevent the can from tipping in a plane parallel to the plate 25. When the motor 12 is operated, the feeding roller 31 will be rotated through the gear box 15 and the shaft 28, this rotation causing the can to be moved along the surface of the feeding roller. The pressure roller bearing against the top of the can rim insures that the movement of the can will be positive and uniform, the pressure being sufficient to cause the teeth of the feeding roller to bite into the metal so that paper or other material will not cause slippage of the feeding roller. This is a common difficulty with can openers wherein the feeding roller operates against the lower edge of the can rim. The paper labels attached to the side walls of the can commonly interfering with the feeding operations. As the can moves under the influence of the feeding roller 31, the top of the can will be cut by the stationary cutter at a point directly adjacent the side walls of the can in the manner shown in Fig. 3. Attention is directed to the positive manner in which the can is held during these operations. Tipping of the can in a plane parallel to the body plate 25 is prevented by the fingers 61 and 62, and the can is given a slight tilt in a plane at right angles to the body plate by the tongue 36. The rim of the can is firmly held between the pressure roller 43 and the feeding roller 31 while the rim is prevented from moving from between these rollers by the cutter 46. It is, therefore, impossible for the can to tilt or in any way move from its rightful position on the opener and it is unnecessary for the operator to hold the can or provide any extraneous manner of supporting the same. Likewise, the can cannot tip sufficiently to spill the contents thereof.

Attention is directed to the fact that during these cutting operations it is impossible for the cutter unit to be forced upward by undue cutting pressure or other unforeseen incidents of the cutting operation because of the through center position of the toggle link 44. The cutter unit cannot

be moved upward until the lever 51 is rotated upwardly sufficiently to bring the center of the rivet 54 through the vertical center line of the pivot points. Because of the construction, movement of the lever 51 into its operative position therefore accomplishes not only the piercing of the can and the application of pressure to the top of the can rim but also serves to fix the mechanism so that the cutter unit will be automatically maintained in its position until relieved by a positive act of the operator. A further feature of the toggle mechanism lies in the fact that the toggle link 44 is arcuate in shape so as to give a certain amount of resiliency. This permits the opener to automatically adapt itself to cans of different rim thickness and still permit the upper pivotal point of the toggle link to move through center as described. Thus the resiliency of a toggle link will permit the cutter unit a certain amount of latitude in its cutting positions. A further object of the curved toggle link is to hold the pressure roller against the can rim with a yielding pressure so that the cutter unit may yield to the irregularities of the can rim such as those caused by the splice in the side walls of the can. This materially lengthens the life of the can opener by preventing these irregularities of the rim from distorting the elements of the mechanism and loosening the various pivotal connections.

While I have thus described and illustrated a specific embodiment of my invention, I am aware that numerous alterations and changes may be made therein without materially departing from the spirit of the invention and the scope of the appended claims, in which—

I claim:

1. A can opener comprising a stationary plate, a cutter unit supported for movement on the plate comprising a pressure roller, a cutter knife, and a can guiding element, a rotatable feeding roller on the plate toward and away from which said cutter unit is movable, and a manually operable lever for causing such movement.

2. A can opener comprising a stationary plate, a cutter unit comprising a pressure roller, a knife and a can guiding element, a rotatable feeding roller on the plate, means for mounting the cutter unit on the plate for longitudinal movement toward and away from the feeding roller, a manually rotatable lever on the plate, and means connecting the lever and the unit for moving the latter.

3. A can opener comprising a plate, a rotatable feeding roller on the plate, a cutter unit mounted on the plate on ways for longitudinal movement toward and away from the feeding roller for the insertion and removal of a can to be opened, a lever mounted on the plate above the cutter unit for rotation on an axis substantially parallel with the axis of the feeding roller and on the longitudinal center line of the cutter unit, and a curved toggle link between the lever and the cutter unit for moving the latter and for compensating for different sizes of cans.

4. A can opener comprising a stationary plate, a rotatable feeding roller on the plate, a cutter unit mounted on the plate for movement toward and away from the feeding roller for the insertion and removal of a can to be opened, a lever on the plate movable between a fixed cutting position and a retracted position, and resilient toggle mechanism between the lever and the cutter unit for moving the latter to insert and remove the cutter, the resiliency compensating for different thicknesses of can rims when the lever occupies its fixed cutting position.

5. A can opener comprising a stationary plate, a rotatable feeding roller on the plate, a cutter unit mounted on the plate secured against rotation and for sliding movement toward and away from the feeding roller for the insertion and removal of a can to be opened, a lever secured to the plate above the cutter unit for rotation about an axis on the longitudinal center line of the cutter unit, and a resilient toggle link connecting the cutter unit and the lever constructed to move through said center line to secure the cutter unit in an operative position against the rim of a can, the resiliency in said toggle mechanism accommodating different sizes of can rims with said toggle in its through center position.

6. A can opener comprising a stationary plate, a rotatable feeding roller on the plate, a cutter unit mounted on the plate for movement toward and away from the feeding roller on the plate, a cutter unit mounted on the plate for movement toward and away from the feeding roller for the insertion and removal of a can to be opened, a lever rotatably mounted on the plate above the cutter unit movable between the fixed cutting position and a retracted position, and an arcuate toggle link between the lever and the cutter unit arranged to move through center as said lever is moved into its fixed position, the curvature of said toggle link providing resiliency for the accommodation of cans having rims of different thickness.

7. A can opener comprising a stationary plate arranged to act as a frame, a feeding roller fixed on the plate for rotation, a cutter unit having ways mounted on the plate for sliding movement of the unit toward and away from the feeding roller, and resilient toggle mechanism for moving the cutter mechanism toward the feeding roller to pierce a can to be opened, bring the cutter unit into cutting position against cans having rims of different depths, and hold the unit in said position, and withdraw the unit from the can.

8. A can opener attachment for household mixers comprising a body including a plate and a shank on the plate for supporting the latter on the mixer, a feeding roller on the plate, a shaft in the shank for driving the feeding roller from the mixer, a cutter unit supported on the plate for movement toward and away from the feeding roller for the insertion and removal of a can, and toggle mechanism for moving the cutter unit and for holding the same in a cutting position.

9. A can opener attachment for household mixers comprising a body including a plate and a shank on the plate for supporting the latter on the mixer, a feeding roller on the plate, a shaft in the shank for driving the feeding roller from the mixer, a cutter unit supported on the plate for movement toward and away from the feeding roller for the insertion and removal of a can, toggle mechanism for moving the cutter unit and for holding the same in a cutting position, and a cover plate attached to said first mentioned plate arranged to enclose the cutter unit and toggle mechanism.

10. A can opener comprising a feeding roller, means for driving the feeding roller, a cutter unit movable toward and away from the feeding roller for the insertion and removal of a can to be opened, and means for manually moving the cutter unit, said cutter unit including a pressure roller for holding the can against the feeding

roller, a knife movable across the feeding roller in such proximity as to accommodate the side walls of a can therebetween, and having a diagonal cutting edge and piercing point forward of the center line through the feeding roller and cutter unit whereby rotation of the feeding roller tends to lift the can against the cutting edge, and means on the cutter unit for preventing tilting of the can under such lifting movement.

11. A can opener comprising a substantially flat stationary plate having marginal flanged edges, a rotatable feeding roller located near the lower edge of said plate between said flanged edges, a cutter unit supported against the face of said plate above said feeding roller and between said marginal edges, the unit being supported upon the plate for longitudinal straight line movement toward and away from the feeding roller, a lever pivotally supported upon the plate above the cutter unit for rotation in a plane substantially parallel with the surface of the plate and having its axis of rotation substantially on the longitudinal center line of the cutter unit, a link connecting the lever and the cutter unit to move the cutter unit toward and away from the feeding roller upon rotation of the lever, and a marginally flanged cover plate arranged to frictionally engage the marginal flange of said stationary plate to cover the upper portion of the face of the stationary plate and enclose the cutter unit and pivotal link.

12. A can opener comprising a plate having a longitudinal slot therein, a cutter unit slidably supported in said slot for movement between an operative and an inoperative position, said unit including a pressure roller arranged to bear against the top of a can rim and a knife positioned to pierce the top of a can adjacent the rim as the unit is moved to the operative position, a rotatable feeding roller on the plate against which the lower edge of the can rim is adapted to be pressed by the pressure roller upon movement of the unit to the operative position, a rotatable lever on said plate, a resilient toggle link between the lever and the unit for moving said unit between its positions upon rotation of the lever, and means for rotating the feeding roller to rotate the can and cut the top thereof.

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