

**United States Patent [19]**  
**Yamamoto**

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[45] Sept. 11, 1973

[54] **ELECTRICALLY POWERED CAN OPENER**  
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**[30] Foreign Application Priority Data**

Apr. 24, 1971 Japan..... 46/26881

[52] U.S. Cl..... 30/4 R  
[51] Int. Cl..... B67b 7/38  
[58] **Field of Search**..... 30/4 R; 287/53 R,  
287/DIG. 13

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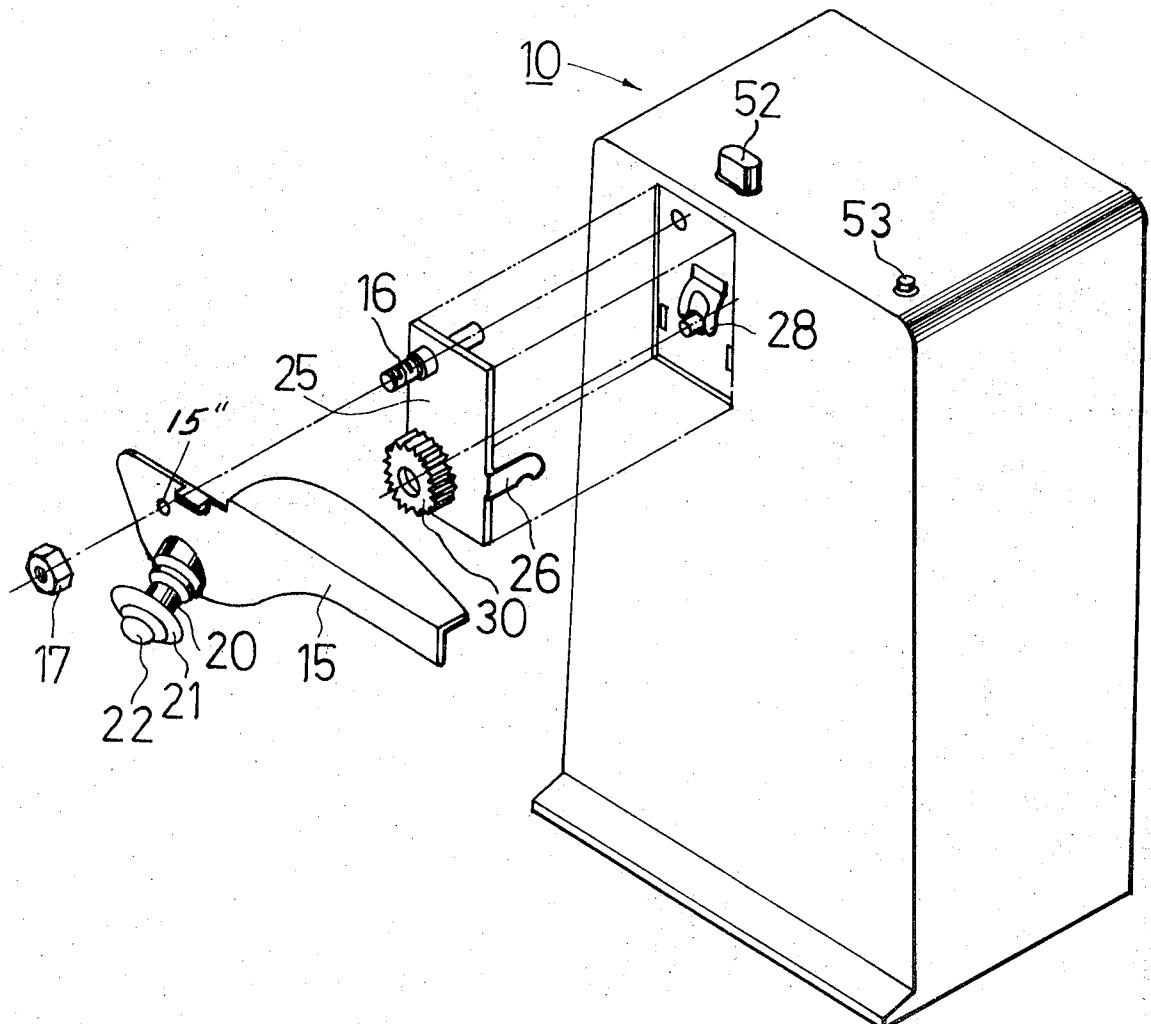
Attorney—Linton & Linton

[57]

## ABSTRACT

An electrically powered can opener including a base mounted detachably on the upright front member of the can opener housing, a cutter base carrying rotatably a rotary cutter and having a pivotal shaft, said pivotal shaft being extending through said base and supported by said upright front member for rotation and ready removal, said base and cutter base being unified by said pivotal shaft, a feed wheel holder fitted rotatably withing a loose aperture formed in said base, a driving shaft disposed in said housing for axially separable connection with said feed wheel holder through said front member and a latching member provided in said housing for precluding separation of said base from said housing and for permitting operation from the exterior of said housing.

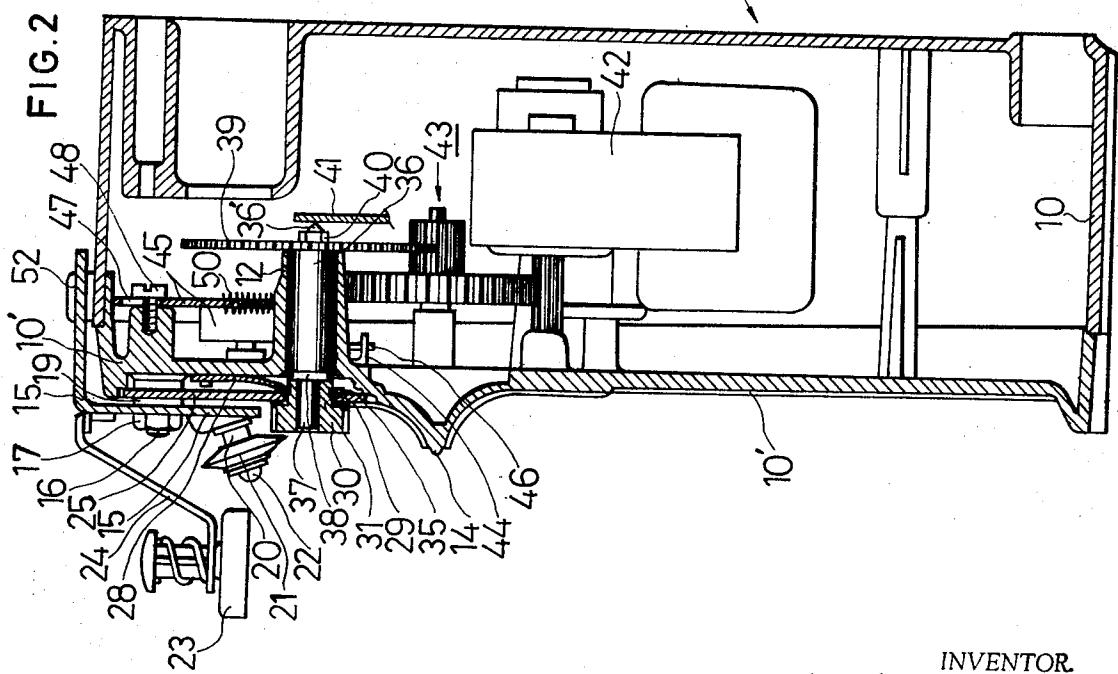
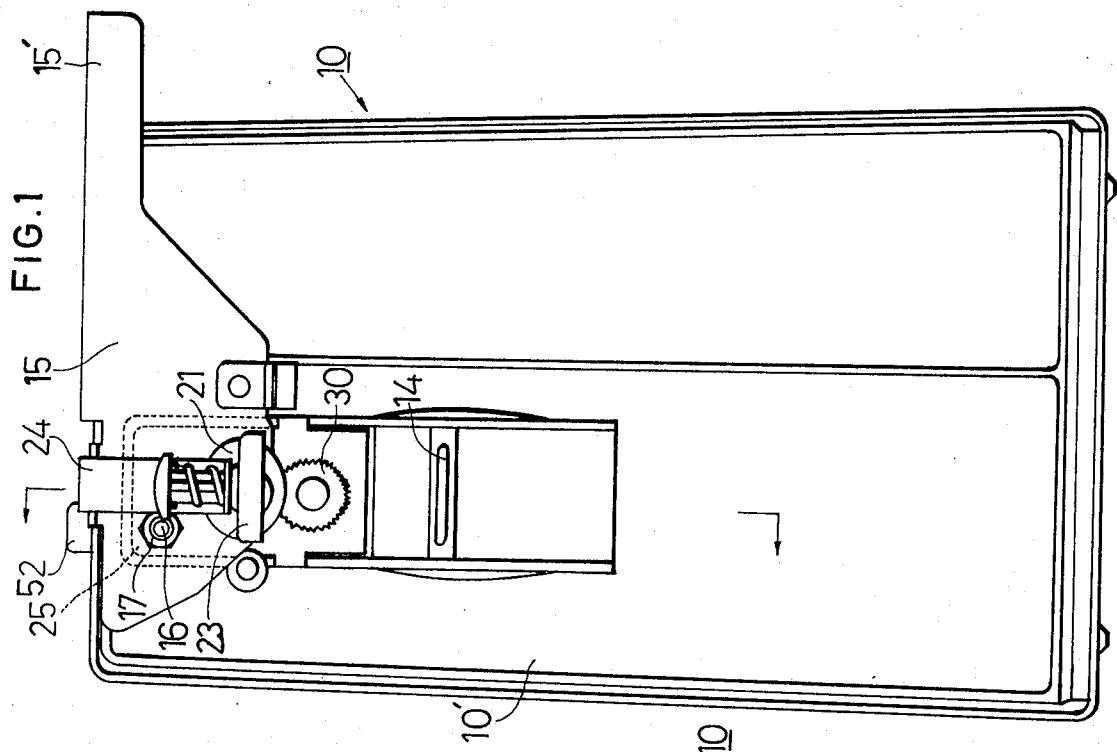
## 5 Claims, 11 Drawing Figures



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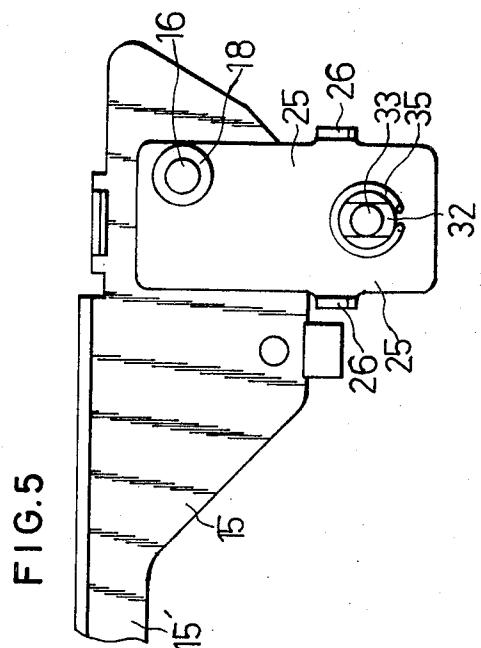
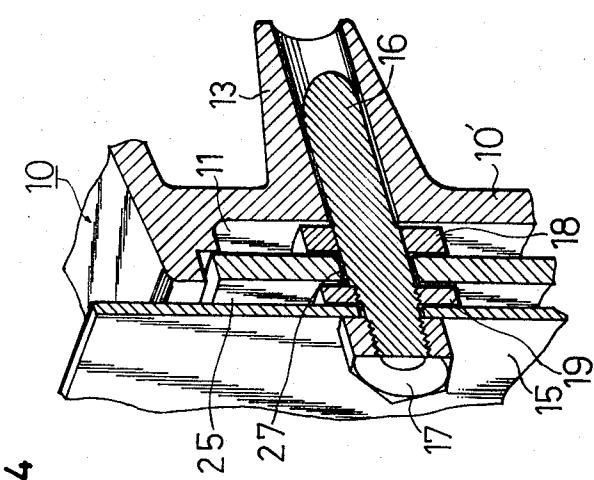
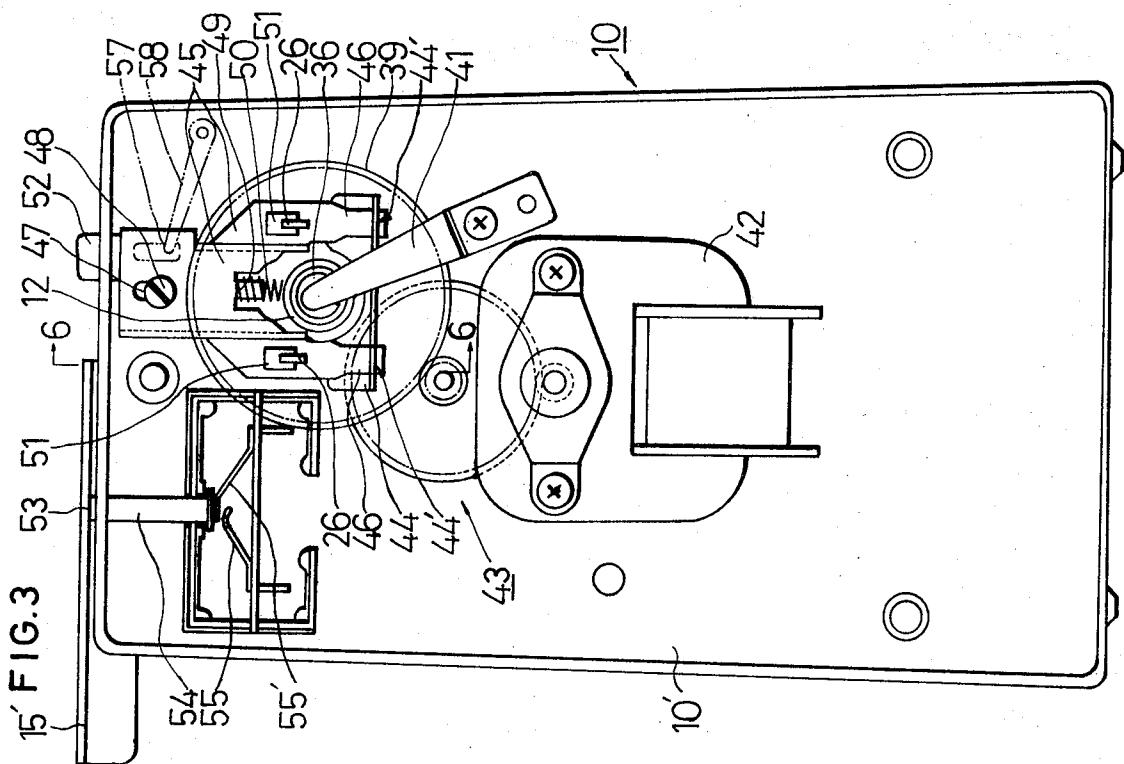
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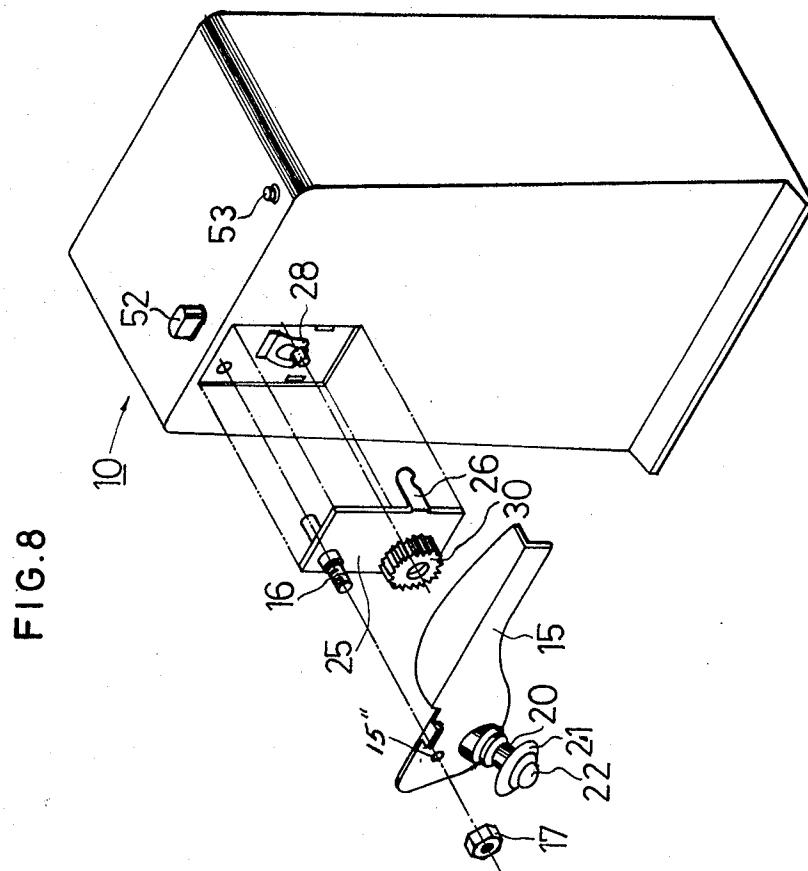
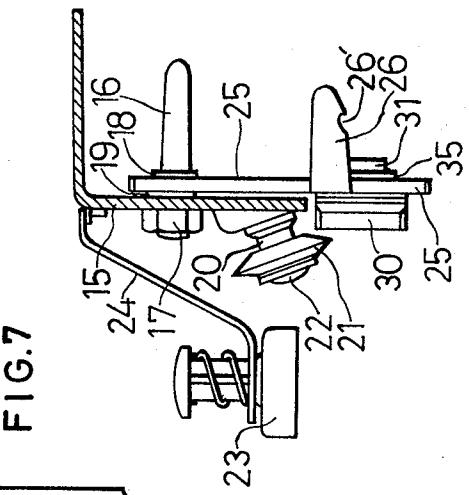
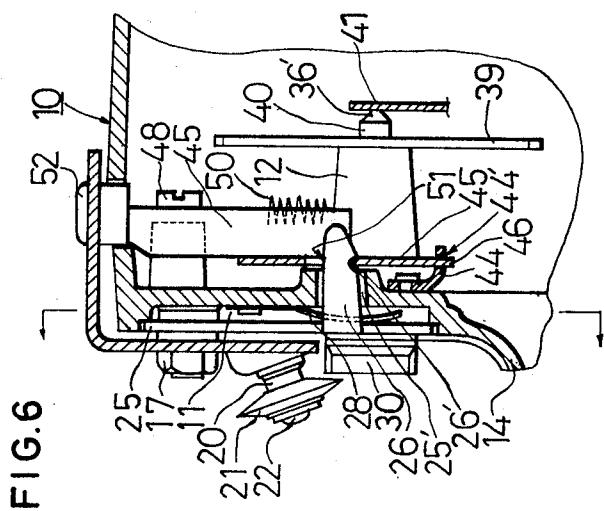
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SHEET 3 OF 4



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## ELECTRICALLY POWERED CAN OPENER

## BACKGROUND OF THE INVENTION

It is conventional practice in opening a can with use of an electrically powered can opener to insert the end rim of the can between a toothed feed wheel extending rotatably in front of the upright front member of the can opener housing and a rotary cutter carried by a cutter base pivotally supported on the housing above the feed wheel and to cut progressively the lid of the can near the inside surface of the end rim. Mainly for the purpose of cleaning the cutter after a can opening operation, the electrically powered can opener of this type is constructed in a manner that the cutter together with the cutter base can be separated from the housing. However, in the course of repeated usages of the can opener, it happens that not only the cutter but also the toothed feed wheel generally affixed to the end extremity of the driving shaft extending from the interior to the exterior of the housing is necessary to be washed. It is a very troublesome work to wash the toothed feed wheel mounted on the housing, because the cutter is of a very small size in comparison with the housing. It is, of course, possible to construct the toothed feed wheel and the driving shaft as a unitary block readily separable from the housing for convenience for cleaning. With this construction, however, the lubricating oil attached on the driving shaft escapes into washing solution in a reservoir and contaminates the reservoir and the toothed feed wheel. This contamination is undesirable in the light of a device dealing with cans containing food stuffs. The lubricating oil attached on the driving shaft is decreased in every washing work and there is such trouble that lubricating oil must be supplemented.

## SUMMARY OF THE INVENTION

An electrically powered can opener according to the present invention includes a base detachably mounted on the upright front member, a cutter base carrying a cutter rotatably and having a pivotal shaft, said pivotal shaft being supported rotatably and separably through an apertured portion of said base and said base and cutter base being unified by said pivotal shaft, and a latching member operable from the exterior of the housing for the purpose of precluding withdrawal of said base. A feed wheel holder carrying a rotary cutter fixedly is supported on said base for free rotation and is connected for axial separation to the end extremity of a driving shaft extending beyond the upright front member of the housing from the interior of same. When the pivotal shaft is supported by the upright front member and is latched by the latching member not to be withdrawn, the feed wheel holder is in position to be connected to and rotated by the driving shaft. When the pivotal shaft is made separable by operating the latching member, the cutter base carrying the rotary cutter and the base carrying the feed wheel holder can be withdrawn as a unified body from the housing for the purpose of washing. Thus, cleaning work becomes very easy and the contamination of the cutter or the toothed feed wheel with lubricating oil of the driving shaft is eliminated.

## IN THE DRAWINGS

FIG. 1 is a front elevational view of an electrically powered can opener;

FIG. 2 is a sectional side elevational view of the electrically powered can opener;

FIG. 3 is a rear view of the electrically powered can opener with the rear member of the housing being taken away;

FIG. 4 is a perspective view in partial cross-section showing the mounting relationship of a cutter base and a base with respect to the housing;

FIG. 5 is a rear view of the cutter base and the base;

FIG. 6 is a section along line 6—6 in FIG. 3;

FIG. 7 is a side elevational view of the base separated from the housing;

FIG. 8 is an exploded perspective view showing the relationship between the housing, the base and the cutter base of the can opener; and

FIGS. 9a-9c are fragmental perspective views showing the connecting relationship between a toothed feed wheel and the driving shaft thereof.

Referring to the drawings, a housing of a can opener 20 is indicated by numeral 10 and is provided with an upright front member 10'. The upright front member 10' is so shaped to have a square depressed portion 11, from the internal surface of which a horizontal bearing boss 12 is protruding towards the interior of the housing 25. On the left of and above the bearing boss 12, another bearing boss 13 is similarly extending towards the interior of the housing from the internal surface of the depressed portion 11 and under the bearing boss 12, a can guide 14 is extending forwardly of the housing 10 from the upright front member 10'. A cutter base 15 having an integral grip 15' at one end extremity and a pivotal hole 15'' at the other end portion is mounted rotatably on the upright front member 10' by a pivotal shaft 16 inserted in the pivotal hole 15'' and the bearing boss 13 and to the end portion of the pivotal shaft 30 a nut 17 is in threaded connection with pivotal shaft 16 for unification of the pivotal shaft and the cutter base and for precluding withdrawal of the former. The intermediate portion of the pivotal shaft 16 is provided with a head 18 and between this head and the nut 17, another nut 19 is in connection with pivotal shaft 16 as a spacer. From the lower part of the cutter base 15, a cutter carrying stud 20 is extending in an oblique downward direction and a rotary circular cutter 21 is 35 mounted rotatably on the stud 20, withdrawal of the cutter being prevented by a screw 22 affixed to the end extremity of the stud 20. As a means for holding a cut-off can lid, a magnet 23 is held forwardly of the cutter 40 21 by an arm 24 extending from the upper portion of the cutter base 15. A base 25, which has such a size that it can be positioned on the front surface of the depressed portion 11, is provided with a pair of perpendicular stopping members 26 at both sides of the base. The end portions of these stopping members are made 45 thin as shown and the lower edges of the same have cuts 26' and 26'' respectively. Through the upper portion of the base 25, a loose aperture 27 is bored and the part of the pivotal shaft 16 between head 18 and nut 19 is 50 inserted rotatably within this loose aperture 27. The stopping members 26 are inserted in the interior of the housing through slots 25' formed through the depressed portion 11 of the upright front member 10'. A push out spring 28 is secured on the front surface of the 55 depressed portion 11 whereby the base 25 placed closely before the front surface of the depressed portion 11 is biased forwardly of the housing by the push out spring 28.

thus mounted, the lower portion of the end rim of a can to be opened is made in contact with the toothed feed wheel 30 and the grip 15' of the cutter base 15 is gasped to be lowered, the start push button 53 is depressed by the grip 15' to close the electrical contacts 55 and 55' and the electric motor 42 is started to rotate the driving shaft 36 through the reduction gear assembly 43. The toothed feed wheel is rotated with support by the driving shaft 36 immediately when the projection 38 is fit in the jointing groove 32 and after only the driving shaft 36 rotates to fit the projection 38 in the jointing groove 32 due to the biasing force of the planar spring when the projection 38 is not fit in the jointing groove 32. At this time, as the edge of the rotary cutter 21 is in contact with the can lid closely inside the end rim and the can is rotated by the toothed feed wheel 30, also the rotary cutter 21 is rotated with the stud 20 as the center axis and the driving force of the toothed feed wheel 30 exerting on the rotary cutter 21 through the can lid rotates the cutter base 15, as a torque, in a direction towards the can around the pivotal shaft 16, the piercing position of the rotary cutter 21 into the can lid being maintained automatically. In this situation, the rotary cutter 21 proceeds to open the can. When the can is cut out completely, the above-mentioned torque disappear and the grip 15' is lifted slightly by a restoring spring suitably provided. Then the electrical contacts 55 and 55' are disconnected to stop the electric motor 42. The opened can can be withdrawn from the can opener by further lifting the grip 15'.

Next, when it is desired to withdraw the rotary cutter 21 and the toothed feed wheel 30 from the housing for the purpose of cleaning, the engaging relationship between the latching member 45 and the stopping members 26 is released by depressing the push button 52 to lower the latching member 45 once and then making the cuts 26' out of registration with the lower edge of the opening 51. Because no members prevent the cutter base 15 and the base 25 unified by the pivotal shaft 16 from moving forwardly of the housing 10, the base 25 and the cutter base 15 are pushed forth slightly by the force of the push out spring 28 (the planar spring 41 in the absence of the push out spring 28) urging the base forwardly and keep their slightly pushed out position. Then, the cutter base 15 carrying the rotary cutter and the base 25 carrying the toothed feed wheel are withdrawn from the housing 10, the situation shown in FIG. 7 being attained.

As is understood from the foregoing description description, the toothed feed wheel 30 is separated from the housing 10 very readily and quickly by releasing the engagement between the stopping members 26 and the latching member 45 and cleaning work of the toothed feed wheel becomes very easy. Of course, contamination of the toothed feed wheel 30 with lubricating oil of the driving shaft 36 escaping in washing solution at the time of washing is avoided, because the toothed feed wheel 30 is separated from the driving shaft therefore and the periphery of the aperture 29 can practically dispense with the provision of lubricating oil. Besides, provision of lubricating oil for the driving shaft 36 is not necessary as the lubricating oil on the driving shaft 36 is not washed off.

Although the present invention has been described with preferred embodiments, it should be understood that many modifications and changes are possible with-

out departing from the spirit of the present invention and the accompanying claims.

What I claim is:

1. In an electrically powered can opener having a housing, a driving shaft rotatably supported in said housing and an electric motor for rotating said driving shaft, a combination therewith of an upright front member of said housing, a cutter base having a grip at one end portion, a rotary cutter rotatably carried by said cutter base, a base closely mounted on said upright front member and provided with two loose apertures, a pivotal shaft affixed to said cutter base, said pivotal shaft extending through one of said loose apertures, said base being disposed on said upright front member, means unifying said cutter base and said base in cooperation with said pivotal shaft, a feed wheel holder extending through and spaced from the other of said loose apertures, a toothed feed wheel carried by said feed wheel holder, stopping member perpendicularly secured on said base, said feed wheel holder being inserted in the other of said loose apertures so that the base may not be subjected to the reaction force of the can cutting operation, said stopping member extending interiorly of said housing through a slot formed through said upright front member, said feed wheel holder and said driving shaft being connected to establish the transmission of rotation from the latter to the former and to make possible mutual separation in the axial direction, means precluding withdrawal of said feed wheel holder from said base, a latching member operable from the exterior of said housing and moveable vertically, said latching member having such a form that at a certain position thereof it cooperates with said stopping members to preclude separation of said base from said upright front member and a spring for biasing said latching member to a position where said latching member engages with said stopping members with the engagement between said latching member and said stopping member being released by depressing said latching member against said spring.
2. The combination as described in claim 1 including an axial hole bored along the axis of said feed wheel holder, a diametrical jointing groove formed on the end extremity surface of said feed wheel holder facing said driving shaft, an integral centering member formed on the end portion of said driving shaft facing said feed wheel holder, a projection formed on the necked down portion between said driving shaft and said centering member, said centering member having a form fit exactly in said axial hole, said projection having a form fit exactly in said diametrical groove, and a spring secured on said housing for biasing said driving shaft towards said upright front member.

3. An electrically powered can opener as described in claim 1 including a spring secured on said upright front member, said spring biasing said base away from said upright front member.

4. The combination as described in claim 1, including electrical contacts connected in the power source circuit of said electrical motor, an operation rod for operating said contacts and a start push button attached to said operation rod, said start push button extending exteriorly of the top of said housing at a position where said start push button can be depressed by said grip of said cutter base.

5. The combination as described in claim 1, including an arm extending from said cutter base forwardly of said rotary cutter and a magnet supported by said arm for the purpose of attracting a cut off can lid.

\* \* \* \* \*



# United States Patent [19]

Savage et al.

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[54] CUTTER

1,653,340 12/1927 Carolus..... 30/179

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Primary Examiner—James L. Jones, Jr.  
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[21] Appl. No.: 157,506

## [57] ABSTRACT

A cutter suitable for cutting, for example, swaged-on metal collars of lockbolts to facilitate removal of the lockbolts has two blades movable to bring their cutting edges together to cut a collar between them, and has resilient guides attached to the blades for guiding the blades to cut a collar or other workpiece symmetrically.

## [30] Foreign Application Priority Data

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[51] Int. Cl. ..... B26b 17/04

[58] Field of Search ..... 30/124, 131, 134,  
30/135, 179, 186, 187, 191, 192, 193, 233

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1 Claim, 9 Drawing Figures

