

[54] **ELECTRIC CAN OPENER**

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[73] Assignee: Kawaguchi Shoichi, Aichi-ken, Japan

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Aug. 29, 1970 Japan45/75701

[52] U.S. Cl.30/4 R, 30/9

[51] Int. Cl.B67b 7/38

[58] Field of Search30/4 R, 8, 85, 9

[56] **References Cited**

UNITED STATES PATENTS

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Primary Examiner—Othell M. Simpson

Assistant Examiner—Gary L. Smith

Attorney—Linton & Linton

[57] **ABSTRACT**

An electric can opener has an elongate lever carrying a cutter wheel and pivoted forwardly of a front member of a housing at a slot formed at one end portion and longitudinally of the lever.

The lever is provided with a locking member extending towards the front member and is locked in a longitudinally displaced position by the engagement between the locking member and an engaging piece extending forwardly of the front member when the lever is displaced along its longitudinal direction within the length of the slot by the thrust exerted to the lever as the result of the can opening operation of the cutter wheel.

2 Claims, 5 Drawing Figures

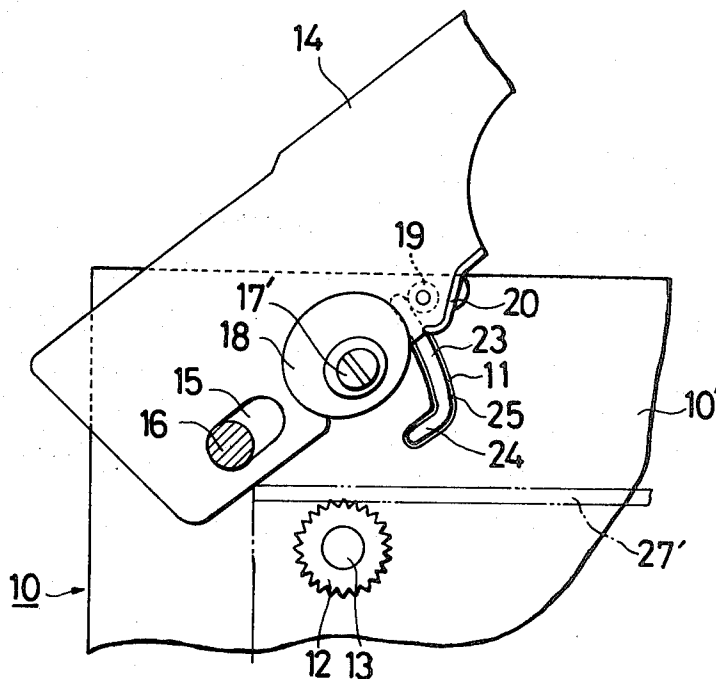


FIG. 1

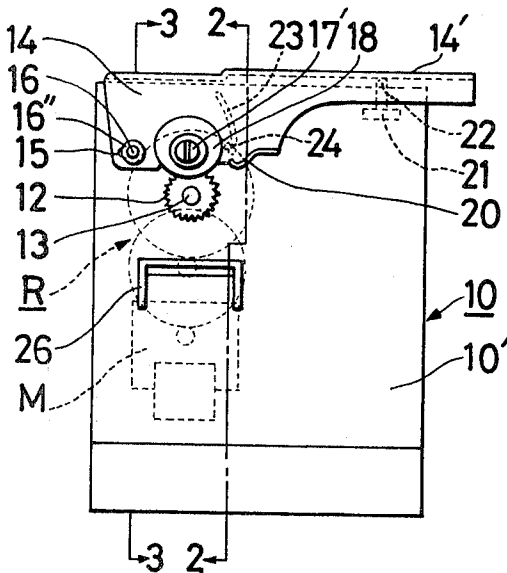


FIG. 2

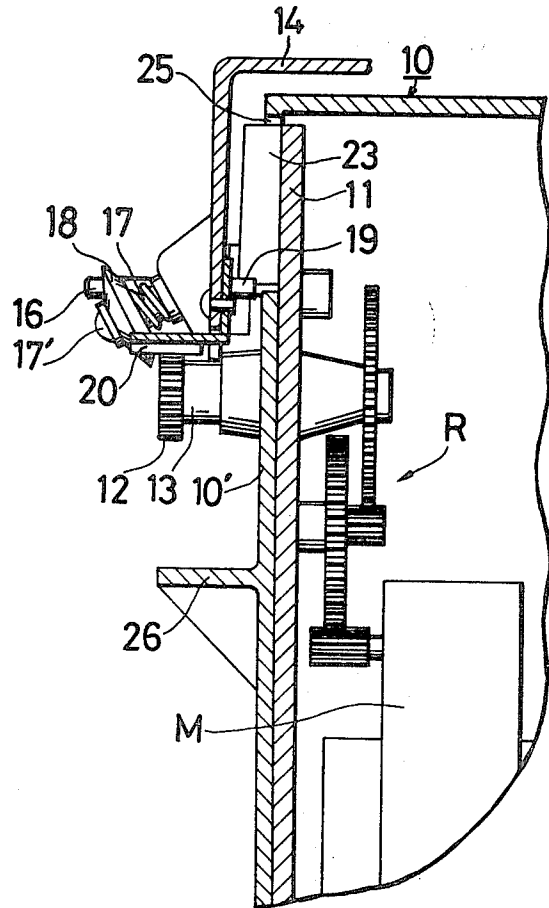
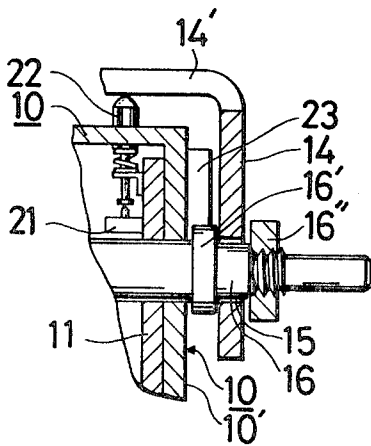


FIG. 3



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FIG. 4

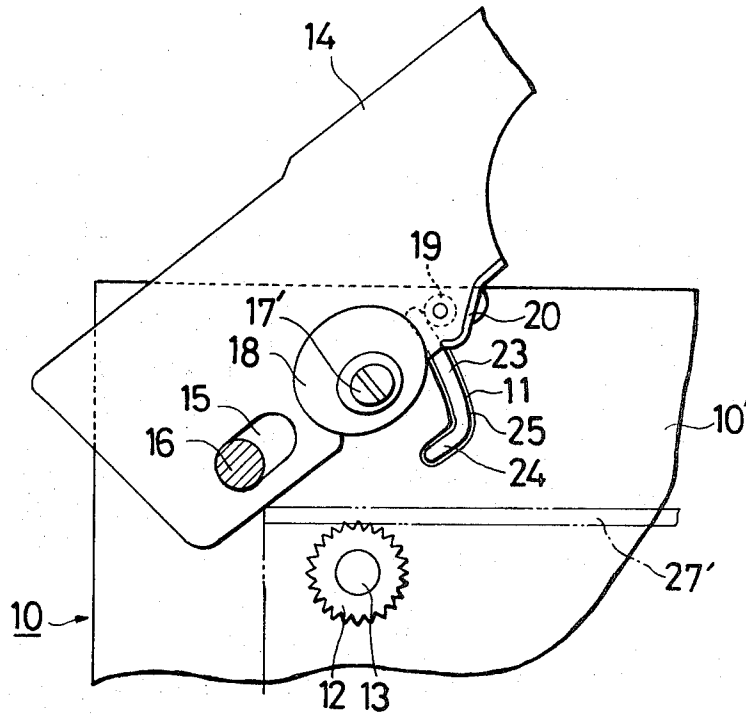
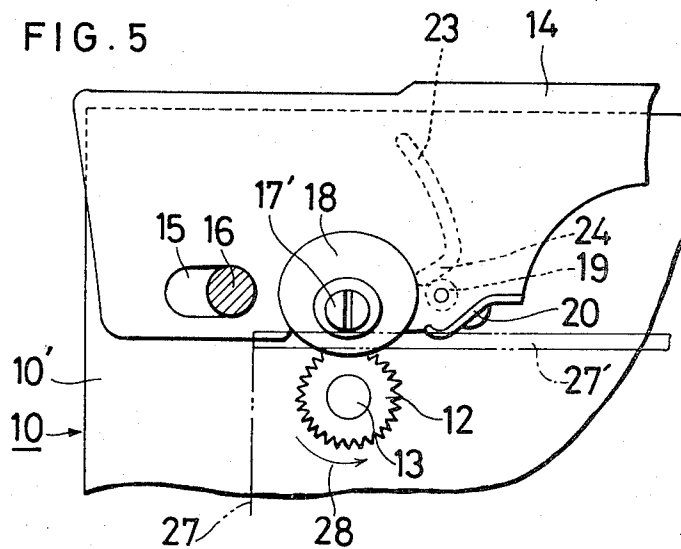


FIG. 5



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ELECTRIC CAN OPENER

This invention relates generally to an electric can opener and more particularly to such an electric can opener which can automatically continue its severing operation without an operation by a user to hold a lever carrying a cutter wheel once the cutter wheel has pierced into a lid of a can and in which the lever is returned automatically to its non-piercing position after the completion of the severing operation at the time of the disappearance of the thrust exerted to the cutter wheel, the actuation for the cutter wheel being stopped at the same time.

This type of can openers is conventionally known and many devices have been invented, which, however, have to include complicated mechanisms to transmit the thrust exerted to the cutter. Accordingly such devices require much time and cost for their production on account of many constructional members and of their complicated combination and operate by no means simply, suffering from more times of misoperation and trouble.

One object of the present invention is to provide a constructionally simple can opener in which an elongate lever carrying a cutter wheel is automatically held so as to establish a can opening arrangement during the can opening process.

Another object of the present invention is to provide a constructionally simple can opener in which the lever is returned to the non-piercing position and the actuation for a feeder wheel is stopped as soon as the severing operation is finished.

Still another object of the present invention is to provide a can opener of low cost and reliable operation due to the small number of constructional members.

The other objects of the present invention will become clear from the following description and claims taken in conjunction with accompanying drawings, in which:

FIG. 1 is a front elevation of a can opener according to the present invention,

FIG. 2 is an enlarged fragmentary sectional view taken along line 2—2 of FIG. 1 with the housing and elongated lever removed,

FIG. 3 is an enlarged fragmentary sectional view of said can opener showing the mounting situation of a cutter carrying lever,

FIG. 4 is an enlarged fragmentary front elevation showing the lever in an unlocked position, and

FIG. 5 is a view similar to FIG. 4 but showing the lever in a locked position.

Referring to drawings, on a mounting frame 11 provided in a housing designated generally by the reference numeral 10 are mounted an electric motor M and a reduction gear assembly R connected directly to the electric motor M. A toothed feeder wheel 12 is attached to a portion of a shaft 13 of the reduction gear assembly R that extends rotatably through a vertical front member 10' of the housing 10. A lever 14 with a slot 15 is pivoted by a supporting shaft 16, which extends through the vertical front member 10', through a planar reinforcing member attached on the rear surface of said vertical front member 10' and the slot 15. An aperture shaped spacer 16' adapted to the supporting shaft 16 between the vertical front member 10' and the lever 14 and a nut 16'' threadably attached to the threaded portion of the shaft 16 forwardly of the vertical front member 10' keeps the lever 14 at an appropriate

distance from the front member 10' and prevents the lever 14 from falling off from the shaft 16. Thus, the lever 14 is in position not only to be pivoted around the supporting shaft 16 but also to be displaced along its longitudinal direction within the length of the slot 15. The lever 14 carries a stud 17 projecting forwardly of the front member 10' in the oblique downward direction with respect to the front member 10' and a cutter wheel 18 is rotatably attached to said stud 17 by a screw 17'. At the opposite side of the lever 14 with respect to the stud 17 their extends a rod-like locking member 19. The lever 14 is provided at its lower edge with a spring finger member 20 for preventing the vertical movement of a can in the can opening operation. In the upper interior of the housing 10 are disposed a switch 21 for starting or stopping the electric motor and a push button 22 therefor which extends above the top surface of the housing 10. The switch 21 and the push button 22 are constructed and connected electrically in such a manner that the push button 22 is pushed down by a grip 14' forming the free end portion of the lever 14, to close the switch 21 when the lever 14 is lowered down and the lever 14 is raised up by the restoring force of the push button 22, the switch 21 being opened, when a force exerted to the push button 22 is removed. An arc shaped guiding member 23 and an engaging piece 24 integral with it and turning towards the center of the curvature side of the guiding member 23 are provided extendingly through the front member 10'. The guiding member 23, the engaging piece 24, which is positioned obliquely with respect to the longitudinal direction of the lever 14 disposed so as to establish a can opening arrangement, may be attached to the front member 10' but can be attached to the reinforcing planar member 10'' to extend through an elongate and curved opening 25 bored through the front member 10' if this is made of such a weak material as plastics. The arc shaped guiding member 23 is positioned in such a manner that its outer circumferential surface can be in contact with and guide the rod-like locking member 19 when the lever 14 is pivoted. On the other hand, the engaging piece 24 is located at such a position on the front member 10' where it can be in contact with the cylindrical side surface of the locking member 19 and prevent the same from moving upwards along the arc shaped guiding member 23 when the lever 14 is displaced along its longitudinal direction by the thrust exerted to the cutter wheel 18 in the can opening operation. A can side supporter 26 is provided under the feeder wheel 12 protrudingly from the front member 10'.

The operation of the electric can opener constructed as described above is as follows. Firstly, the lever 14 is raised to an appropriate height and a can 27 to be opened is held by a user in such a manner that the lower edge of the end stem 27' of the can contacts with the feeder wheel 12 and the cylindrical side surface of the can 27 with the front surface of the supporter 26. Next, when the lever 14 is lowered down, the arc shaped guiding member 23 guides the locking member 19 to a position suitable for the cutter wheel 18 to contact with the lid of the can 27. Then, the cutter wheel 18 pierces the lid of the can 27 at the immediate inside of the end stem and at the same time the grip 14' of the lever 14 pushes down the push button 22, thereby closing the switch 21. As the result of this operation of the lever 14, the cutter wheel 18 is rotated by the electric

motor M in the direction shown by the arrow 28 keeping contact with the end stem 27'. Thus, the lid of the can 27 continues to be severed by the cutter wheel 18 which has just pierced the lid. In this case, the lever 14 is displaced towards the supporting shaft 16 by the horizontal thrust exerted to the cutter wheel 18 as best shown in FIG. 5 and the locking member 19 contacts with the engaging piece 24. In this situation, as the locking member 19 is pushed to the engaging piece 24 by the resultant of the restoring force of the push button 22 and said thrust; the resultant of the friction force between the engaging piece 24 and the locking member 19 and the horizontal thrust surpasses the component of the restoring force of the push button 22 to return the lever 14 upwards and so the lever 14 is maintained in a position where the cutter wheel 18 is piercing the lid even after the removal of the depressing force exerted to the grip 14' of the lever 14. When the lid is severed completely. The lid is severed out and the horizontal thrust exerted to the lever 14 disappears. As the restoring force of said push button 22 is exerted to the free end portion of the lever and the lever 14 is movable horizontally until the one end of said slot 15 contacts with the supporting shaft 16, the locking member 19 rises slightly in a right hand and upward direction of FIG. 5 along the oblique surface of the engaging piece so long as the restoring force of the push button 22 is present and then the lever stops. At the same time, also the push button 22 is returned to its free position to open the switch 21 and the rotation of the electric motor M and the toothed feeder wheel 13 is stopped. In this situation, the end stem 27' of the can 27 is placed on the feeder wheel 12 and the cutter wheel 18 is still piercing the lid at the immediate inside of the end stem 27'. Then, the can 27 can be removed from the can opener if the user raises the lever 14 to the position shown in FIG. 4.

As is clear from the foregoing description, it is possible to provide an electric can opener of very simple construction in which the lever 14 and the cutter wheel 18 are held automatically so as to establish the can opening arrangement in the can opening process after the lever 14 is lowered to cause the cutter wheel 18 to pierce the lid of the can 27 and the lever 14 is returned to its original position at the time of the disappearance of the thrust exerted to the cutter wheel 18 after the completion of the can opening operation. Further, as it is sufficient for locking the lever 14 in the can opening position during the can opening operation only to provide additionally the locking member 19 formed integrally with the lever 14 and the engaging piece 24 ex-

tending through the front member 10', an electric can opener of the type described above can be constructed with small number of constructional members and it is expected to reduce the cost of manufacture and the possibility of trouble.

Although the above description has been done with respect to the preferred embodiments it is to be understood that many changes and modifications are possible without departing from the scope of the present inventions and claims thereof.

What I claim is:

1. A can opener comprising a housing having a vertical front member, an electric motor mounted in said housing, a reduction gear assembly, a toothed feeder wheel rotatably supported through said vertical front member of said housing and connected to said electric motor through said reduction gear assembly, an elongated lever provided with a slot extending longitudinally of one end portion of said lever, a shaft on said housing, said shaft pivotally supporting said elongated lever, said shaft extending through said slot being slidable in the longitudinal direction of said lever within the length of said slot, a cutter wheel rotatably carried by said lever, a locking member extending from said lever towards said vertical front member of said housing, said locking member having a side surface, a push button slideably mounted on said housing at a position for being moved in one direction by the other end portion of said lever upon the pivoting of said lever towards said push button, a spring tending to move said push button in a direction opposite to said one direction, a switch operatively connected to said push button and said electric motor, a source of current connected to said switch, a guiding member extending forwardly through said vertical front member of said housing at a position such that said guiding member can be in contact with said side surface of said locking member when said lever is displaced longitudinally of said slot, a guiding member with a side surface in contact with said locking member, being positioned obliquely at such a degree with respect to the longitudinal direction of said lever that the friction arising between said guiding member and said locking member as the result of the restoring force of said push button spring and the thrust exerted to said lever in the can opening operation can prevent said lever from temporarily returning along its longitudinal direction and ultimately moving under the force of said push button spring.

2. A can opener as claimed in claim 1 wherein said guiding member has an arc configuration.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,733,698 Dated May 22, 1973

Inventor(s) Osamu Yamamoto

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover sheet, [73] "Kawaguchi Shoichi, Aichi-ken, Japan" should read -- Kabushikikaisha Aichidenkikisakusho, Kasugai-shi, Aichi-ken, Japan --.

Signed and sealed this 26th day of March 1974.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents