Oct. 30, 1962 J. NISENSON 3,060,568

ELECTRIC CAN OPENER

Filed Sept. 13, 1960 3 Sheets-Sheet 1

Fig. 1

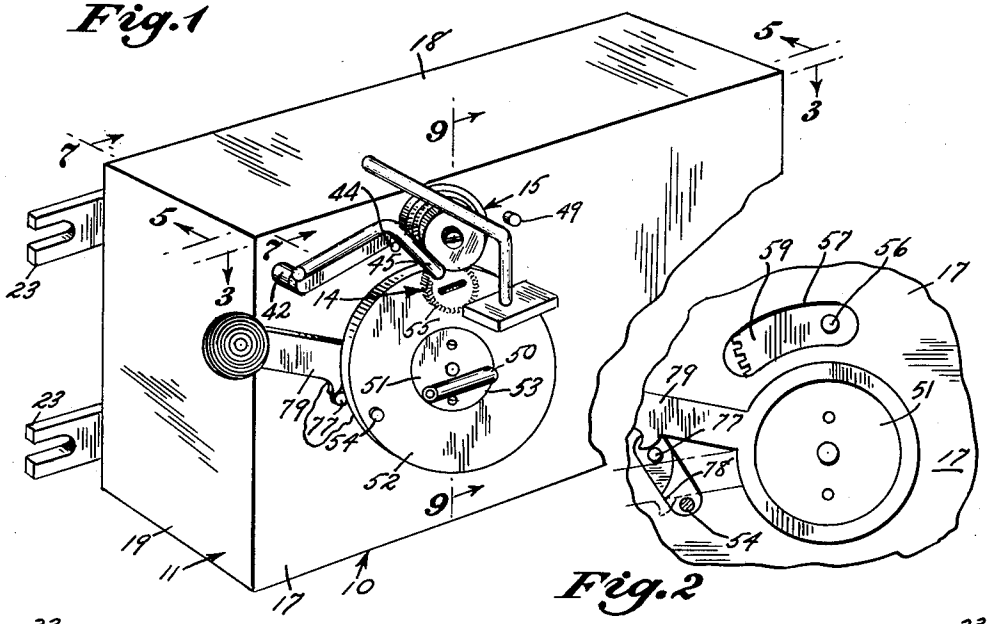


Fig. 2

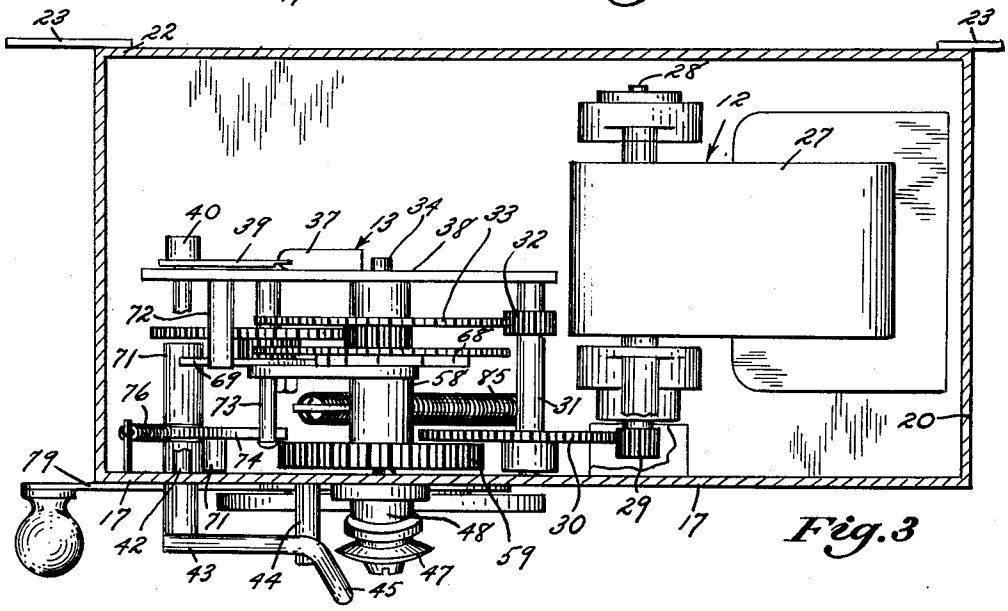


Fig. 3

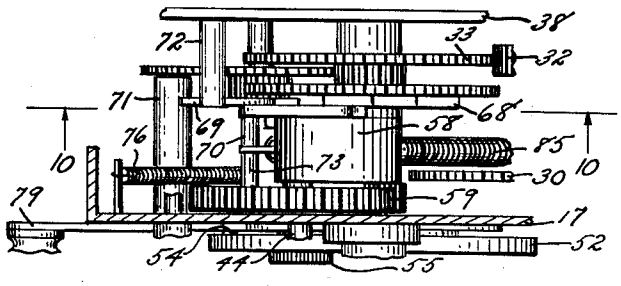


Fig. 4

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ELECTRIC CAN OPENER

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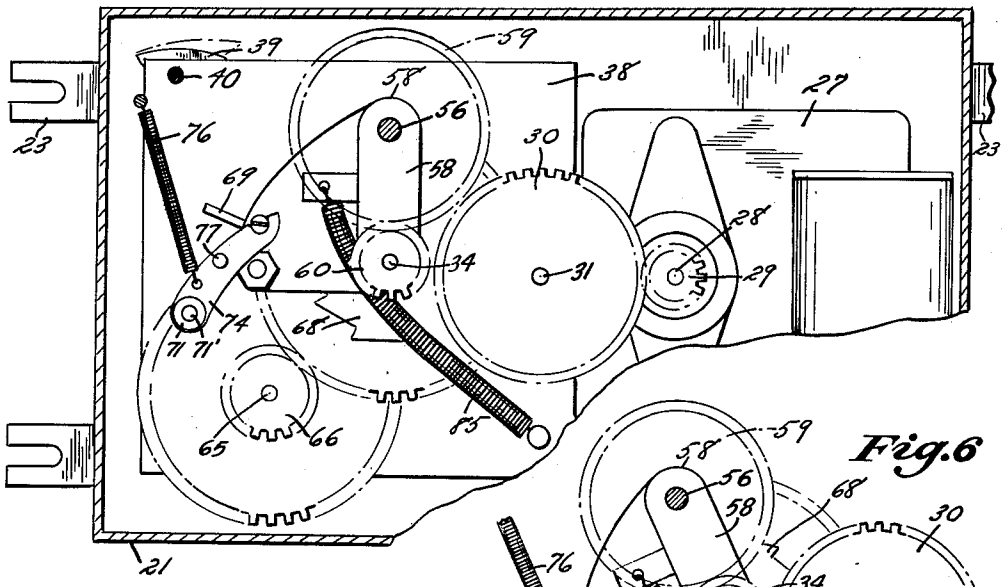


Fig.5

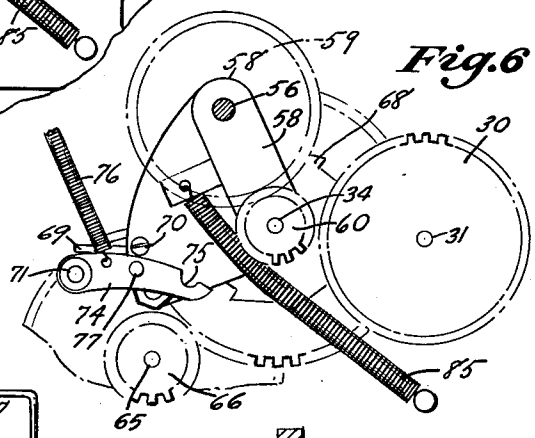


Fig.6

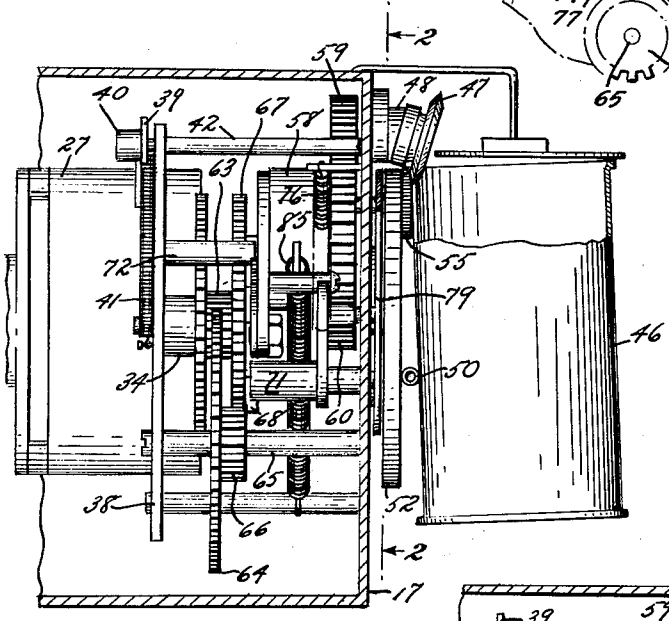


Fig.7

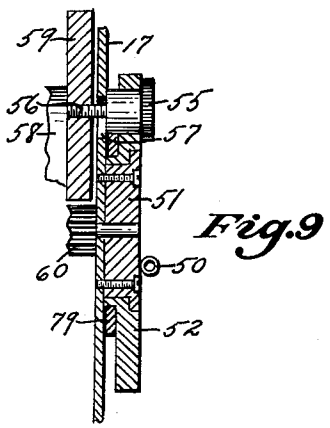


Fig.9

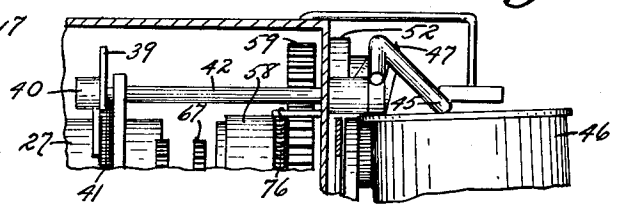


Fig.8

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ELECTRIC CAN OPENER

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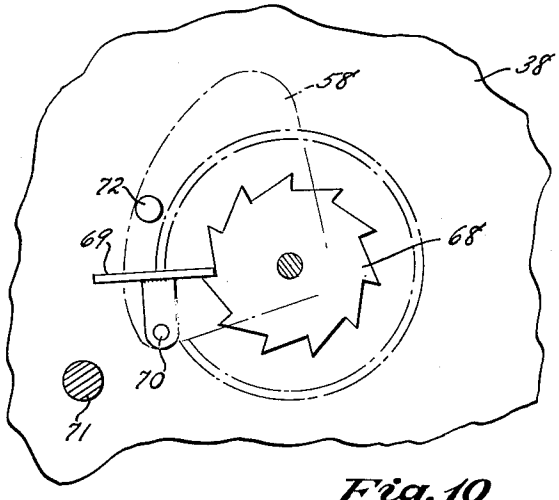


Fig. 10

United States Patent Office 3,060,568 Patented Oct. 30, 1962

3,060,568

ELECTRIC CAN OPENER

Jules Nisenson, Rye, N.Y., assignor to Darmon Tool & Manufacturing Corp., New York, N.Y., a corporation of New York

Filed Sept. 13, 1960, Ser. No. 55,674
5 Claims. (Cl. 30—4)

This invention relates generally to the field of electric can openers employed for severing the lid of a metallic can during the process of opening the same. Devices of this type are generally known in the art, and the invention lies in specific constructional details permitting advantages in operation heretofore unavailable.

In the present state of development of the art, most electrically powered can openers differ from manually operated ones in the provision of electric means for driving a small toothed wheel engaged with the rim of a can to drive the same beneath a rotary blade resembling in most respects a similar hand-operated device. In such devices, the toothed wheel rotates about a relatively fixed axis, and lever means is used to translationally move the pivotally mounted blade into pierced engagement with the can. Upon the interlocking of the can between the wheel and the blade, an electric motor is activated which drives the can for so long as the can is in engaged condition.

It is among the principal objects of the present invention to provide an improved can opener construction in which the manual positioning of a can in cutting position commences the operation of the device, following which the toothed wheel is orbitally moved to engage the can and provide sufficient power to permit the blade to pierce the lid portion thereof, so that all substantial effort on the part of the user is completely avoided.

Another object of the invention is to provide improved can opener construction in which operation of the motor-driven parts thereof is interrupted upon completion of the severing of the lid from the rim portion of the can, and to hold the can in engaged position until such time as it is desired to disengage the same.

A further object of the invention lies in the provision of improved can opener construction in which the manual disengagement of an open can thererfom is substantially effortless, and in which additional force may be applied should the can become in any manner jammed in association with the device.

A still further object of the invention lies in the provision of improved can opener construction possessed of the above advantages in which the cost of fabrication may be of a relatively low order, thereby permitting consequent wide sale, distribution and use.

A feature of the invention lies in the fact that substantially all of the moving parts may be concealed within an attractive housing to be mounted upon a wall or other vertical surface.

These objects and features, as well as other incidental ends and advantages, will more fully appear in the progress of the following disclosure, and be pointed out in the appended claims.

In the drawings, to which reference will be made in the specification, similar reference characters have been employed to designate corersponding parts throughout the several views.

FIGURE 1 is a fragmentary front perspective view of an embodiment of the invention.

FIGURE 2 is a fragmentary view in elevation of the central portion of FIGURE 1, with certain of the component parts removed.

FIGURE 3 is a horizontal sectional view as seen from the plane 3—3 in FIGURE 1.

FIGURE 4 is a fragmentary sectional view corresponding to that seen in FIGURE 3, but showing certain of the component parts in altered relative position.

FIGURE 5 is a fragmentary enlarged vertical sectional view as seen from the plane 5—5 in FIGURE 1.

FIGURE 6 is a fragmentary sectional view corresponding to that seen in FIGURE 5, but showing certain of the component parts in altered relative position.

FIGURE 7 is a fragmentary enlarged vertical sectional view as seen from the plane 7—7 in FIGURE 1.

FIGURE 8 is a fragmentary sectional view corresponding to that seen in FIGURE 7, but showing a can in position prior to severance of the lid therefrom.

FIGURE 9 is a fragmentary vertical sectional view as seen from the plane 9—9 in FIGURE 1.

FIGURE 10 is a sectional view as seen from the plane 10—10 in FIGURE 4.

In accordance with the invention, the device, generally indicated by reference character **10**, comprises broadly: an outer casing element **11**, prime mover means **12**, switch means **13**, can-driving means **14** and can-holding means **15**.

The outer casing element **11** is preferably formed from sheet metal, although the same may be also formed from injection molded synthetic resinous materials. It includes a front wall **17**, an upper wall **18**, side walls **19** and **20**, a bottom wall **21** and a rear wall **22**. Bracket means **23** may be of any suitable type permitting the device to be attached to a vertical surface such as a wall of a room, cabinet or the like.

The prime mover means **12** includes an electric motor **27** having a motion output shaft **28** and suitable reduction means including a pinion **29**, a gear **30** on a shaft **31** which also mounts a pinion **32**. The pinion **32** drives a gear **33** on shaft **34**.

The switch means **13** includes a standard precision type switch **37** of a normally open circuit type, the same being mounted upon an intermediate wall or support **38**. The switch is moved to a closed circuit position by a cam **39** mounted upon a horizontally arranged shaft **40**, a spring **41** serving to cause contact with the switch. The shaft **40** extends through an opening **42** in the front wall **17**, where it supports a lever member **43**. Movement imparted by the spring **41** is limited by a stop member **44'** on the front face of the front wall **17**. The lever member **43** includes a feeler portion **45** which extends into the position normally occupied by the lid of a can **46** when the lid is in relatively unsevered condition.

The can driving means **14** coacts with an angularly disposed cutting blade **47** supported for rotation on mounting means **48** by the front wall **17**. A can-guiding stud **49** maintains the can in proper orientation with respect to the blade **47** as does a projection **50** which engages the outer surface of the can **46**. As best seen in FIGURE 1, the projection **49** extends outwardly of the wall **17**, while the projection **50** is supported by a circularly shaped mounting plate **51** fixed with respect to the wall **17**.

Surrounding the plate **51** is an annularly shaped plate **52** having a central opening **53** engageable with the plate **51** which serves as pivotal support means. A disengagement stud **54** projects inwardly from the plate **52**, the purpose of which will become more fully apparent hereinafter. Projecting outwardly of the plate **52** is a toothed wheel **55** of conventional type, the same being supported on a shaft **56** extending through a curved opening **57** in the wall **17**. The shaft **56** is supported upon a radial member **58**, and is capable of orbital motion with respect to the shaft **34**. Motion is imparted to the shaft **56** by a gear **59** thereon, the gear **59** being driven by a pinion **60** on the shaft **34**.

The can-holding means **15** performs automatically a function previously manually accomplished in prior art devices. It includes a small pinion **63** on the shaft **34** which drives a gear **64** on an adjacent shaft **65**. The

shaft 65 also mounts a pinion 66 which engages a large gear 67 which turns freely upon the shaft 34. Formed integrally with the gear 67 is a ratchet wheel 68. A pawl 69 is pivotally mounted upon a sector on the radial member 58. A cam member 71 on a pawl 74 contacts the pawl 69 and moves it to an engaged condition with respect to the ratchet wheel 68, while a corresponding cam 72 on the wall 38 disengages the pawl with respect to the ratchet wheel upon the movement of the radial member 58 from a lowermost limit of its path of travel to an uppermost limit thereof.

Extending forwardly of the radial member 58 on a pin 70 is a projecting stud 73 which cooperates with a locking pawl 74 on the pin 71' supported in turn from the wall 17. A spring 76 urges the pawl 74 in a normally upward direction. The pawl 74 mounts thereon a pin 77 which projects through a slot 78 in the front wall 17, to be selectively engaged by a portion of a pivotally mounted lever 79 anchored for rotational movement by an inner portion of the plate 51. As may be seen from a consideration of FIGURE 2, downward movement of the lever 79 first disengages the pawl 74, and subsequent movement contacts an inwardly extending stud 54 supported by the plate 52.

Operation

Operation of the device is commenced by placing a can 46 in contact with the feeler portion 45 of the lever member 43 and moving the same upwardly until the rim of the can is positioned beneath the edge of the cutting blade 47. This movement will close the switch 37, and commerce operation of the motor 27. As the device 10 will normally be in relatively disengaged condition, the pawl 69 will have been engaged by the cam 71, whereby the can engaging means will be driven from the shaft 34. This motion will result in orbital movement of the radius member 58, wherein the toothed wheel 55 will move from the position shown in FIGURES 4 and 6 to the position shown in FIGURES 3 and 5. Upon arriving at the engaged condition, the rim of the can 46 will be firmly gripped between the wheel 55 and the blade 47, following which the pawl 69 will be disengaged by the cam 72, and the pawl 74 engaged with the pin 70 in the notch 75. When the can has rotated through substantially 360°, the end portion thereof will have been severed, permitting the feeler portion 45 to drop, thereby interrupting operation of the electric motor 27. The device may remain in this condition until the can is removed by pressing downwardly upon the lever 79, which results in disengaging the pawl 74. This will normally return the can-engaging means 15 to a disengaged position under the action of a spring 85. Should the can become jammed, continued pressure of the lever 79 will engage the stud 54 causing the plate 52 to be forceably rotated to move the radius member 58, permitting the can to be removed.

I wish it to be understood that I do not consider the invention limited to the precise details of structure shown and set forth in this specification, for obvious modifications will occur to those skilled in the art to which the invention pertains.

I claim:

1. In an electrically driven can opener having a driven toothed wheel engaging a can, improved means for imparting translational movement to said toothed wheel comprising a first shaft, a pinion on said shaft, a radius member mounted for relative rotational movement upon said shaft, a second shaft supported upon said radius member for rotation about an axis parallel to that of said first shaft, a gear on said second shaft, said pinion driving said gear, said toothed wheel being supported for rotation with said second shaft, and means for imparting arcuate motion to said radius member, said last mentioned means including a second pinion fixed for rotation with said first shaft, a third shaft mounted for rotation parallel to said first shaft, a second gear on said third shaft, said second pinion driving said second gear, a third pinion fixed on said third shaft, a third gear on said first shaft and capable of relative movement with respect thereto, said third pinion driving said third gear; said third gear having clutch means for selectively engaging said radius member.

2. In an electrically driven can opener having a driven toothed wheel engaging a can, improved means for imparting translational movement to said toothed wheel comprising a first shaft, a pinion on said shaft, a radius member mounted for relative rotational movement upon said shaft, a second shaft supported upon said radius member for rotation about an axis parallel to that of said first shaft, a gear on said second shaft, said pinion driving said gear, said toothed wheel being supported for rotation with said second shaft, and means for imparting arcuate motion to said radius member, said last mentioned means including a second pinion fixed for rotation with said first shaft, a third shaft mounted for rotation parallel to said first shaft, a second gear on said third shaft, said second pinion driving said second gear, a third pinion fixed on said third shaft, a third gear on said first shaft and capable of relative movement with respect thereto, said third pinion driving said third gear; said third gear having clutch means for selectively engaging said radius member; and means for automatically engaging said clutch means when said toothed wheel is in disengaged condition relative to the rim of a can.

3. In an electrically driven can opener having a driven toothed wheel engaging a can, improved means for imparting translational movement to said toothed wheel comprising a first shaft, a pinion on said shaft, a radius member mounted for relative rotational movement upon said shaft, a second shaft supported upon said radius member for rotation about an axis parallel to that of said first shaft, a gear on said second shaft, said pinion driving said gear, said toothed wheel being supported for rotation with said second shaft, and means for imparting arcuate motion to said radius member, said last mentioned means including a second pinion fixed for rotation with said first shaft, a third shaft mounted for rotation parallel to said first shaft, a second gear on said third shaft, said second pinion driving said second gear, a third pinion fixed on said third shaft, a third gear on said first shaft and capable of relative movement with respect thereto, said third pinion driving said third gear; said third gear having clutch means for selectively engaging said radius member; means for automatically engaging said clutch means when said toothed wheel is in disengaged condition relative to the rim of a can; and means for automatically disengaging said clutch means upon engagement of said rim.

4. In an electrically driven can opener having a driven toothed wheel engaging a can, improved means for imparting translational movement to said toothed wheel comprising a first shaft, a pinion on said shaft, a radius member mounted for relative rotational movement upon said shaft, a second shaft supported upon said radius member for rotation about an axis parallel to that of said first shaft, a gear on said second shaft, said pinion driving said gear, said toothed wheel being supported for rotation with said second shaft, and means for imparting arcuate motion to said radius member, said last mentioned means including a second pinion fixed for rotation with said first shaft, a third shaft mounted for rotation parallel to said first shaft, a second gear on said third shaft, said second pinion driving said second gear, a third pinion fixed on said third shaft, a third gear on said first shaft and capable of relative movement with respect thereto, said third pinion driving said third gear; said third gear having clutch means for selectively engaging said radius member; means for automatically engaging said clutch means when said toothed wheel is in disengaged condition relative to the rim of a can; means for automatically disengaging said clutch means upon engagement of said rim, and

pawl means for retaining said radius member in fixed position upon the disengagement of said clutch means.

5. In an electrically driven can opener having a driven toothed wheel engaging a can, improved means for imparting translational movement to said toothed wheel comprising a first shaft, a pinion on said shaft, a radius member mounted for relative rotational movement upon said shaft, a second shaft supported upon said radius member for rotation about an axis parallel to that of said first shaft, a gear on said second shaft, said pinion driving said gear, said toothed wheel being supported for rotation with said second shaft, and means for imparting arcuate motion to said radius member, said last mentioned means including a second pinion fixed for rotation with said first shaft, a third shaft mounted for rotation parallel to said first shaft, a second gear on said third shaft, said second pinion driving said second gear, a third pinion fixed on said third shaft, a third gear on said first shaft and

capable of relative movement with respect thereto, said third pinion driving said third gear; said third gear having clutch means for selectively engaging said radius member; means for automatically engaging said clutch means when said toothed wheel is in disengaged condition relative to the rim of a can; means for automatically disengaging said clutch means upon engagement of said rim, and pawl means for retaining said radius member in position to maintain said toothed wheel is engaged condition with respect to a can.

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