July 24, 1956 R. B. FLEMING 2,755,548

CONTAINER OPENERS

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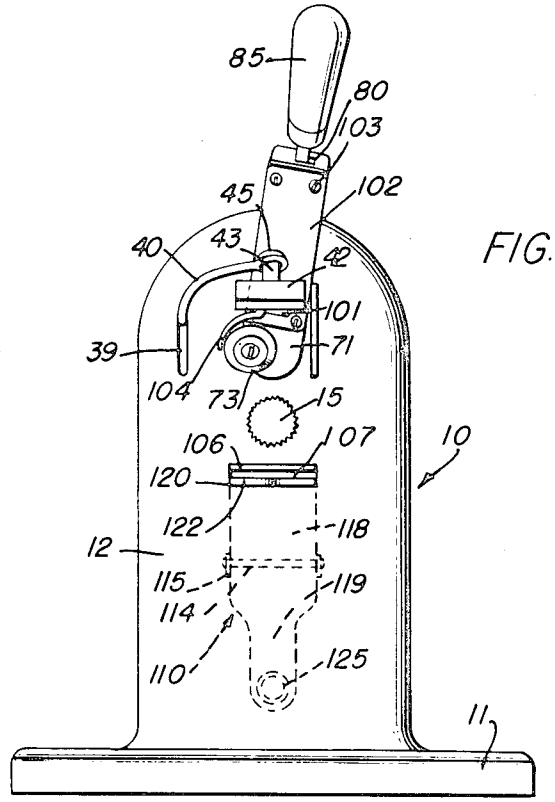


FIG. 1.

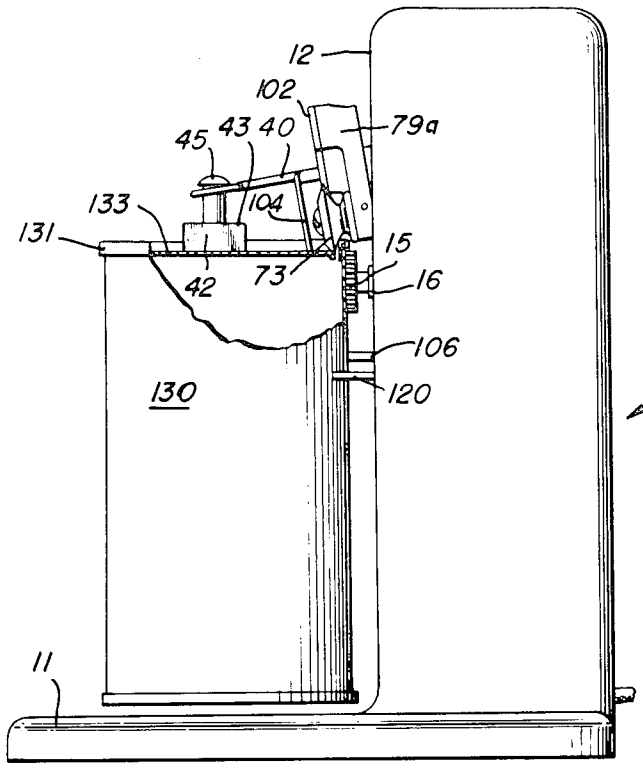


FIG. 4.

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FIG. 5.

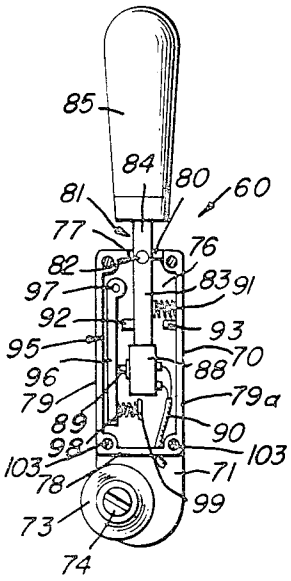


FIG. 2.

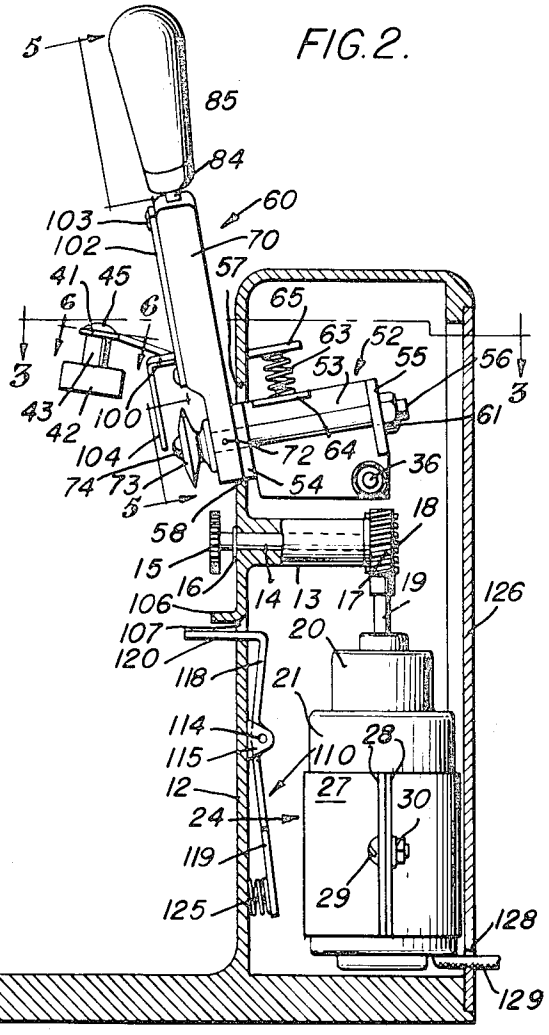


FIG. 3.

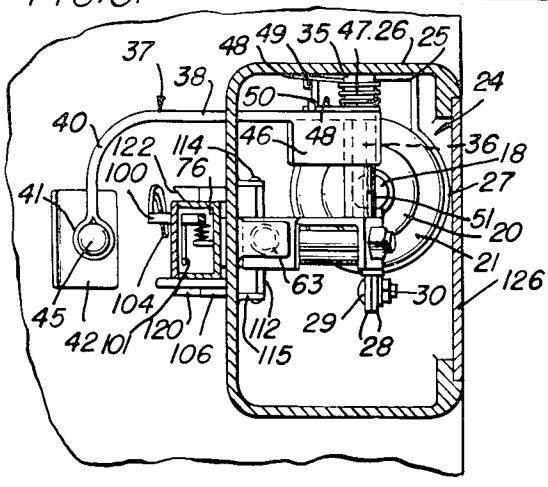
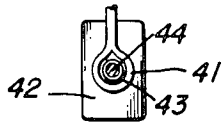


FIG. 6.



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CONTAINER OPENERS

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Application May 26, 1955, Serial No. 511,180

8 Claims. (Cl. 30—4)

This invention relates generally to new and useful improvements in can openers, and relates more particularly to can openers of the power driven type.

While the invention has particular utility embodied in can openers for household use, and is shown and described in such an embodiment, it is to be understood that its utility is not confined thereto.

It is an object of the present invention to provide a power driven can opener adapted to sever the tops of upright cylindrical cans peripherally along the inside of the circumferential top beads during can rotation.

Another object of the invention is to provide a device of this character that is electrically operated.

Still another object of the invention is to provide a device of this character wherein there is an electric motor which is automatically controlled.

A further object of the invention is to provide a device of this character wherein the electric motor does not start to operate and drive the cutter element until the control lever has been actuated to a position whereat the cutter element has punctured the can top and is in cutting position.

A still further object of the invention is to provide a device of this character wherein the electric motor is automatically stopped when the cover of the can has been completely severed without the necessity of any additional manipulation of the control lever.

Another object of the invention is to provide a device of this character wherein the cutting wheel will automatically move out of the way of distorted portions of the bead of the can and thus avoid injury to the mechanism, said cutting wheel being adapted to automatically return to the cutting position and continue cutting the can top when the distorted portions are passed.

Still another object of the invention is to provide a device of this character that will readily and automatically accommodate cans of various sizes and effectively open said cans.

A further object of the invention is to provide a device of this character which will automatically retain the cans in proper cutting position.

A still further object of the invention is to provide a device of this character that is extremely safe to operate and wherein the risk of injury to the operator is substantially eliminated.

Another object of the invention is to provide a device of this character that is relatively simple and durable in construction, and that is simple, efficient and reliable in operation.

Still another object of the invention is to provide a device of this character that is relatively inexpensive to manufacture.

A further object of the invention is to provide a device of this character that is exceedingly effective for the purpose for which it is intended.

A still further object of the invention is to provide a device of this character that is very attractive in appearance.

The characteristics and advantages of the invention are further sufficiently referred to in connection with the following detailed description of the accompanying drawings which illustrate one embodiment. After considering this example, skilled persons will understand that many variations may be made without departing from the principles disclosed, and I contemplate the employment of any structures, arrangements or modes of operation that are properly within the scope of the appended claims.

Referring to the drawings:

Fig. 1 is a front elevation of a can opener embodying the present invention;

Fig. 2 is a vertical section through the device showing the internal parts;

Fig. 3 is a cross sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a side elevation of the device with a can in position for cutting and the parts of the device in cutting position;

Fig. 5 is a front view of the control lever with the cover removed to show the electrical control system, and;

Fig. 6 is a cross sectional view taken on line 6—6 of Fig. 2.

Referring more particularly to the drawings, the device comprises a hollow housing, indicated generally at 10, having a supporting base 11. The front wall 12 of the housing is provided with an inwardly extending boss 13 located intermediately of the top and bottom of the housing and substantially midway between the sides, said boss having a longitudinal bore in which is rotatably received a shaft 14. The forward end of shaft 14 extends outwardly of the front wall 12 and carries a peripherally knurled feeding or drive wheel 15 which is secured to said shaft in forwardly spaced relation to said wall 12. A flange 16 limits inward movement of shaft 14 and outward movement is limited by a worm gear 17 which is secured to the inner end of said shaft. Worm gear 17 is meshed with and driven by a worm 18 which is secured to a shaft 19 extending upwardly from a gear box 20 carried at the upper end of an electric motor 21 disposed vertically in said housing. Motor 21 drives shaft 19 through speed reduction gearing, not shown, in said gear box 20. In some types of installation the speed reduction gearing may not be required.

The motor 21 is retained in position in the housing by a clamp, indicated generally at 24, having an intermediate portion 25 secured to a side wall 26 of the housing by screws or other suitable means, not shown. Clamp 24 has portions 27 about the motor and has free end portions 28 with aligned openings therein for reception of a screw 29, said screw being provided with a nut 30 for tightening said clamp and securely holding the motor therein.

Spaced upwardly of the boss 13 is a boss 35 which extends inwardly of the housing from the side wall 26. A bolt 36 has one end secured axially in said boss 35, there being an arm, indicated generally at 37, rotatably mounted on said bolt 36 against the inner end of said boss 35, said arm having a portion 38 extending forwardly and outwardly through a slot 39, Fig. 1, in the front wall 12 of the housing and having a curved portion 40 terminating in an eye 41. The portion 38 of the arm is located adjacent the side 26 of the housing but the eye 41 is positioned in and movable in a vertical forwardly and rearwardly extending plane through the longitudinal center of the housing and in forwardly spaced relation to said housing. A magnet 42 is carried by said arm and has a stem 42 provided with a longitudinally extending threaded bore, not shown, for reception of a screw 44 which loosely secures said magnet to said eye. It will be noted, Fig. 6, that the stem 43

and screw 44 are both smaller in diameter than the inside diameter of the eye, the head 45 of said screw being larger than said inside diameter of the eye.

Arm 37 is yieldingly held in the upper position, best shown in Figs. 1 and 2, by a spring 47 coiled about the boss 35 and having end portions 48 reacting between projections 49 and 50 on the wall 26 and arm portion 38 respectively. Upward movement of the arm portion 38 is limited by the upper end of said slot 39.

A sleeve 51 is disposed on bolt 36 and a bracket, indicated generally at 52, is pivotally mounted on the inner end of the bolt, said inner end projecting outwardly of the adjacent end of said sleeve.

The bracket 52 comprises a plate 53 of generally rectangular shape having an opening adjacent the inner lower corner in which said inner bolt end is received so that the bolt provides a pivotal support for said bracket. The front and rear ends of the plate 53 are provided with ears 54 and 55 respectively which extend laterally of said plate and in the same direction. The ears 54 and 55 are provided with aligned openings for reception of a bolt 56, said openings being so arranged that the bolt 56 inclines downwardly and forwardly through an opening 57 in the front wall 12 of the housing, it being noted that the lower edge of the ear 54 engages the lower edge 58 of said opening 57 to limit downward movement of the forward end of the bracket.

Carried on the forward end of bolt 56 is a control means, indicated generally at 60, and said lever and bolt are secured to the bracket by a nut 61 on the threaded inner end of said bolt.

Bracket 52 is urged downwardly by a relatively heavy spring 63 which is disposed between a flange 64 turned laterally of the plate 52 and an abutment 65 which extends inwardly of the housing from the front wall 12.

The control means 60 comprises a member 70, one end portion 71 of which is attached to the forward end of bolt 56 by any suitable means, such as a pin 72.

A cutter or cutting disk 73 is rotatably secured to the end portion 71 by means of a screw 74, the axis of said cutter being offset from the pivotal axis of the member 70. Thus the cutter is eccentrically mounted relative to the axis of said member 70 and, as best seen in Figs. 1 and 5, said cutter is offset to the left of the axis of said member 70.

Member 70 is provided with a chamber 76 defined at the ends by walls 77 and 78 and at the sides by walls 79 and 79*a*. End wall 77 is located at the free end of member 70 and is provided with an opening 80 therethrough for operable reception of a lever, indicated generally at 81. The latter is pivoted intermediate its ends on a pivot pin 82 located within the opening 80, so that there is an inner end portion 83 disposed within the chamber 76 and an outer end portion 84 to which a handle 85 is attached.

The inner end portion 83 of lever 81 has a switch 88 attached thereto. The switch 88 may be of any suitable type but is shown as being a micro-switch having a switch actuating plunger 89, said switch being secured to the free end of lever 83 by any suitable means such as screws, not shown. Wires 90 are connected to the switch 88 and are suitably connected to the electric motor circuit in the well known manner for controlling said circuit and hence the operation of said motor. Lever 81 is urged in a clockwise direction by a spring 91 and movement of the lever in said direction is limited by a stop 92 with which portion 83 of said lever engages, said stop extending into the path of said lever portion 83 from member 70, a portion of which defines the bottom of said chamber 76. Lever 81 is also limited in its counterclockwise movement on pivot 82 by a stop 93 extending inwardly of said chamber 76 from side wall 79*a*. However, lever 81 has limited movement between said stops.

A second lever, indicated generally at 95, is carried by said member 70, said lever 95 including a portion 96 disposed within the chamber 76 and pivoted adjacent one end on a pivot pin 97 extending into said chamber from the bottom wall thereof. Pivot pins 82 and 97 are substantially parallel to each other and both are adjacent the free end of member 70. Portion 96 of lever 95 is urged in a clockwise direction by a spring 98 which reacts between said lever and an abutment 99 extending into chamber 76 from the member 70. Lever 95 also includes a portion 100 which extends outwardly through a slot 101 in a cover 102 secured to the member 70 by screws 103, and said portion 100 carries an arcuate end portion 104 which is disposed adjacent and in forwardly spaced relation to said cutting disk 73, as best shown in Figs. 2, 3 and 4. The lever 95 is limited in its clockwise movement by engagement of the portion 100 with the left-hand end, as viewed in Fig. 1, of said slot 101 and when the lever is in this position the portion 96 is spaced from the switch plunger 89 as shown in Fig. 5 wherein the various parts are in their normal position. Also when lever 95 is in said position the arcuate part 104 is in a plane spaced radially outwardly of said disk 73 as best shown in Fig. 1.

Can positioning means is provided and includes a horizontal flange 106 spaced downwardly of the feeding or drive wheel 15 and extending forwardly from the front wall 12 of the housing 10. Beneath the flange 106 is a horizontal slot 107 and said flange may be cut from said front wall 12 and turned outwardly thereof.

The can positioning means also includes a lever, indicated generally at 110, having a traverse boss 112, as best shown in Fig. 3, provided with an opening extending lengthwise of said boss for reception of a pivot pin 114. At each end of the boss 112 is an ear 115 which extends inwardly of the housing from the front wall 12 thereof, said ears being provided with aligned openings for reception of end portions of said pin 114 whereby the lever 110 is pivotally mounted and supported by said ears. The lever portions 118 and 119 above and below the boss 112 are inclined away from said wall 12 and form an obtuse angle relative to each other. Lever end 118 has an end portion 120 which is turned outwardly and extends through slot 107 and outwardly of said wall 12 beyond the forward edge of flange 106. End portion 120 has a relatively deep notch 122, best shown in Fig. 3, which extends inwardly from the forward edge and said end portion 120 is urged outwardly and forwardly relative to wall 12 by a spring 125 which reacts between wall 12 and lever portion 119.

The back of the housing 10 is closed by a cover plate 126 which may be removably secured to the housing by any suitable means such as screws, not shown. A hole 128 is provided in the plate through which the electric cord 129 of the motor 21 extends and which is adapted to be plugged into any convenient receptacle connected with a suitable source of power.

Normally the control means 60 is in the upright position as shown in Figs. 1 and 2. When it is desired to open a can, such as indicated at 130, said can is placed in the notch 122 with bead 131 resting on the knurled edge of the drive wheel 15. The weight of the can causes portion 120 to move inwardly against the force of spring 125 until the can engages flange 106 and is in an upright position as shown in Fig. 4.

Handle 85 is then moved in the counterclockwise direction. There is sufficient resistance to movement of the member 70 to cause lever 81 to pivot on pin 82 in the counterclockwise direction so as to move lever portion 83 against stop 93 and thereby move switch 88 to a position whereat lever portion 95 can not actuate the plunger 89. As soon as lever portion 83 engages stop 93 the member 70 is moved with further counterclockwise movement of the handle until the cutter 73 pierces the top 133 of the can 130. As the control means approaches the latter position the portion 104 of lever 95 engages

the can cover 133 and moves the portion 96 of lever 95 toward the plunger 89 of switch 88. The portion 96 of lever 95 does not engage the plunger 89 at this time but is in a position whereat the plunger will engage said portion 96 and actuate said switch upon release of handle 85. Movement of lever portion 83 to cause engagement of plunger 89 with lever portion 96 for actuation of switch 88 is effected by the spring 91 when the handle 85 is released. Also as the control means is moved in the counterclockwise direction member 70 engages the portion 38 of arm 37 and moves same downwardly to a position whereat the magnet 42 contacts the can top 133.

After the control means has been moved to the lowermost position release of the handle will effect closing of switch 88 and thus start motor 21 operating. The motor operates the feed wheel 15 which rotates the can while the cutter severs the cover. Thus by having the motor start after the cutter 73 has pierced the cover certain difficulties have been eliminated and a safety factor is provided. It is also to be noted that the can is held in proper cutting position and against lateral displacement while the can is being cut by means of the reception of said can in the notch 122 of the end portion 120.

As soon as cover 133 has been severed spring 98 moves a lever 95 in the clockwise direction to its limit of movement whereat portion 96 is moved away from switch plunger 89 to thereby effect opening of switch 88 and stopping of the motor. As lever 95 is thus moved the severed cover 133 is tilted by the portion 104 of said lever 95. This action is possible because of the loose connection of the magnet 42 with the eye 41 of lever 37.

Movement of the control means 60 to the upright position by means of handle 85 permits lever 37 to move to its upright position under the influence of spring 47 and due to stop 92 the switch 88 will not be closed during this movement of the control means.

Should the cutter 73 strike a distorted portion of the bead 131 of the can as the device is operating the spring 63 will yield and allow the cutter to move upwardly and pass over said distorted portion. As soon as said distorted portion has passed below the cutter the spring 63 will force said cutter back into the cover so that cutting of said cover from the can will continue.

I claim:

1. In a can opener: a cutter; power means for rotating a can; and means for moving said cutter into and out of cutting position, said means including means for starting said power means after the cutter has punctured the cover of the can and for automatically stopping said power means when said cover is severed.

2. In a power operated can opener for severing covers from metal cans: supporting means; a rotary can feeding member operably carried by said supporting means; a motor connected to said feeding member for driving same; a rotary can cutter; and means for moving said cutter into and out of cutting position, said means including means engageable with the can cover for starting said motor after the cutter has perforated the can cover and is in cutting position, and for stopping said motor when said cover has been severed from the body of the can.

3. In a power operated can opener for severing covers from metal cans: supporting means; a rotary can feeding member operably carried by said supporting means; a motor connected to said feeding member for driving same; a rotary can cutter; means for moving said cutter into and out of cutting position, said means including means for starting said motor after the cutter has perforated the can cover and is in cutting position, and for stopping said motor when said cover has been severed from the body of the can; and yielding means urging the cutter into cutting position when the cutter moving means has moved said cutter into cutting position, said yielding means being adapted to yield when the cutter strikes an obstruction to normal cutting action and permits said cutter to move out of the way of said obstruction.

4. In a power operated can opener for severing end covers from metal cans: supporting means; a rotary can feeding member operably carried by said supporting means; an electric motor connected to said feeding member for driving same; control means, including a cutter positioning member operably carried by said supporting means; a rotary cutter operably carried by said positioning member and being movable thereby into and out of cutting position; a lever pivoted to said member for positioning said cutter; a handle carried by one end of said lever; a normally open switch connected to said motor for controlling same, said switch being carried by said lever and having an actuating member; spaced stops for limiting movement of said lever; a second lever pivoted to said positioning member and having a part normally spaced from said switch actuating member and movably toward and into engagement with same for closing said switch, said second lever having a can cover engageable portion positioned adjacent said cutter; yielding means urging the first mentioned lever toward said second lever part and against one of said stops; and yielding means urging said second lever away from said switch to a position whereat said second lever part is disengaged from said actuating member of said switch so that said switch will be open, actuating of said cutter positioning member by means of said handle moving said first mentioned lever against the other of said stops and actuating said positioning member and hence the cutter to the cutting position whereat the cover is pierced by said cutter, said switch actuating member then being spaced further from said part of said second lever and said actuating of said positioning member to the cutting position effecting engagement of said cover engaging part of said second lever with said cover to move said lever toward said switch actuating member but in spaced relation thereto, release of said handle permitting the first mentioned yielding means to move the first lever against said one stop and causing the switch actuating member to engage said second lever part to effect closing of said switch.

5. The invention defined by claim 4 wherein said cutter positioning member is pivotally mounted to pivot and permit movement of the cutter, when in the cutting position, away from the cover being cut; and yielding means urging said positioning member in the opposite direction.

6. The invention defined by claim 4 wherein there is a pivoted arm having a free end part adapted to be swung to a position over the cover of a can being cut; a magnet; means connecting said magnet to said free end part, said means permitting swinging movement of said magnet; and yielding means urging said arm upwardly; and means limiting upward movement of said arm, said arm being engageable by said cutter positioning member upon movement of said member to the cutting position so that said magnet is moved into engagement with said cover.

7. The invention defined by claim 4 wherein there is a horizontal flange carried by said supporting means beneath said feeding member and in spaced relation thereto for engagement with a can adjacent the upper end thereof; and there is can positioning means beneath said flange, said positioning means including a member having a relatively large, can receiving notch and being urged outwardly relative to the free outer edge of the flange.

8. In a power operated can opener for severing covers from metal cans: supporting means; a rotary can feeding member operably carried by said supporting means; a motor connected to said feeding member for driving same; a can cutter; and means for moving said cutter into and out of cutting position, said means including means engageable with the can cover for starting said motor after the cutter has perforated the can cover and

is in cutting position, and for stopping said motor when said cover has been severed from the body of the can.

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