Dec. 4, 1962 B. L. SMITH 3,066,409

ELECTRIC CAN OPENER

Filed July 1, 1959

2 Sheets-Sheet 1

FIG. 1.

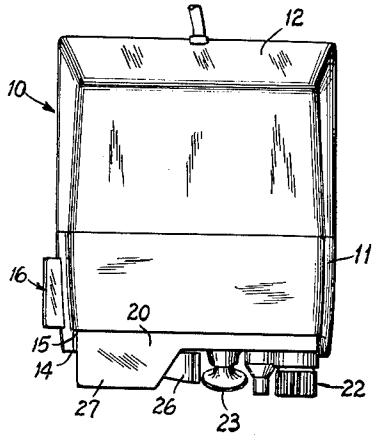



FIG. 3.

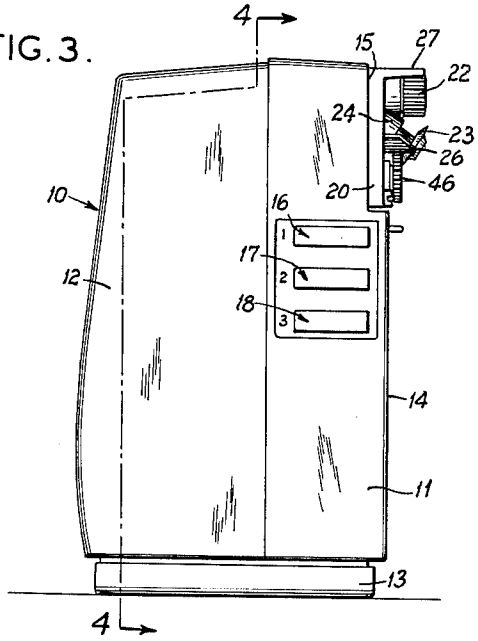



FIG. 2.

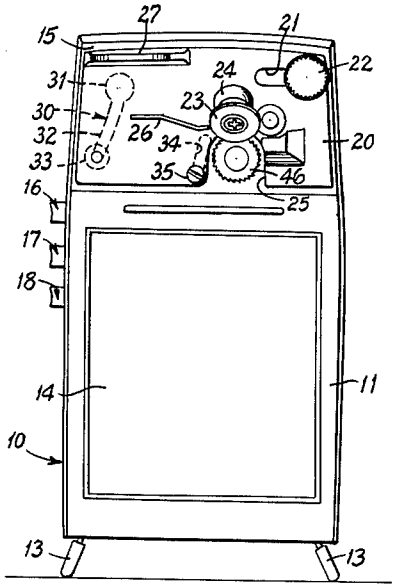



FIG. 4.

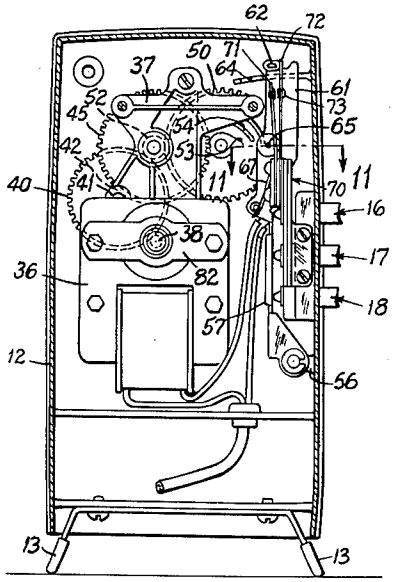
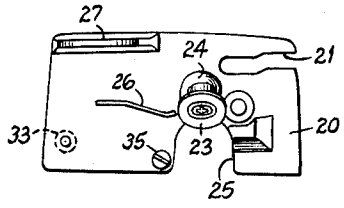



FIG. 5.




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FIG.6.

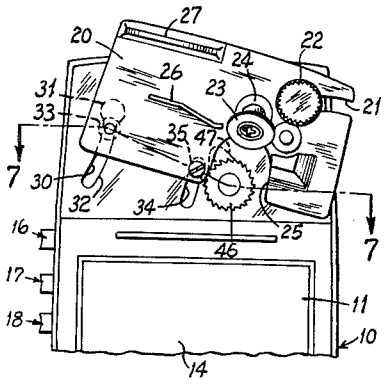



FIG.7.

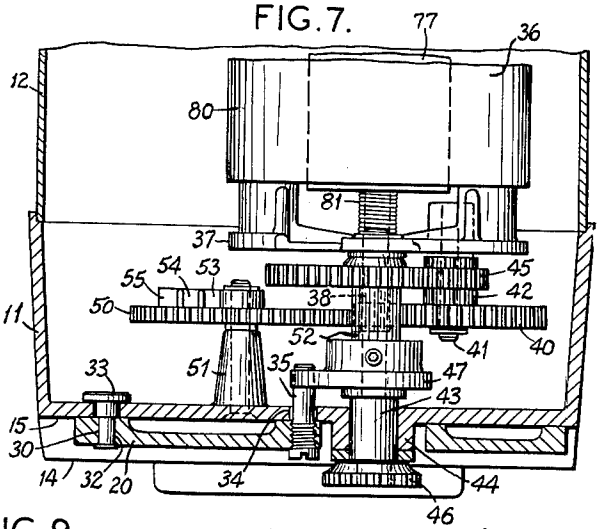



FIG.8.

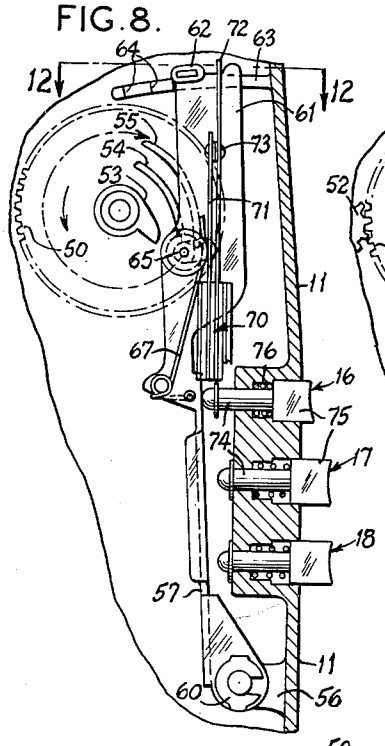



FIG.9.

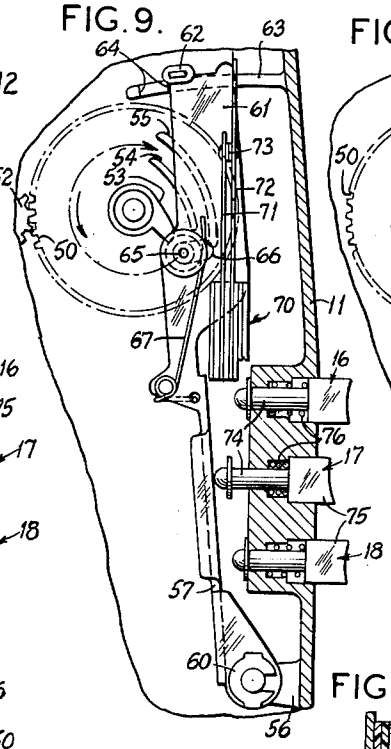



FIG.10.

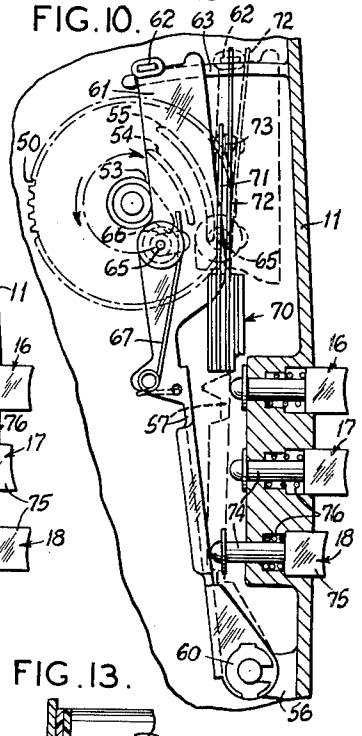



FIG.11.

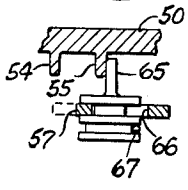



FIG.12.

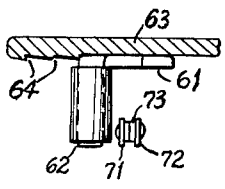
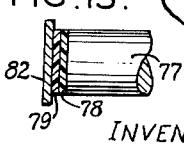



FIG.13.




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3,066,409

# ELECTRIC CAN OPENER

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Filed July 1, 1959, Ser. No. 824,362
21 Claims. (Cl. 30—4)

This invention relates generally to improvements in a can opener, and more particularly to improved means providing a fully automatic, electrically powered can opener.

The chief object of the present invention is to simplify and expedite the operation of opening cans, by providing an electric can opener that merits its extra cost as compared to that of a manual can opener by eliminating certain of the operational procedure incident to the use of manual can openers of conventional type, as well as eliminating the actual work or physical effort involved in operating a manual can opener.

The majority of electric can openers of prevailing design and construction are little more than conventional manual can openers with a motor geared to the drive shaft in place of the customary hand crank. In some such electric can openers it still remains for the operator to operate manually a lever or the like to cause the cutting element to puncture or pierce the can top preparatory to the subsequent severing step, power for which is supplied by the motor.

In addition to preforming the initial puncture, the operator is required to remain at the opener to hold the switch in closed position and to release it to stop the operation when the can top has been completely severed. Where so many procedural steps have to be performed manually, the operator has to remain at the side of the machine while they are being performed. It is believed that such an electrical device is not sufficiently superior to a wall designed manual opener to justify its greatly increased cost.

An important object is to provide an improved electric can opener that is adapted to receive and hold cans of all sizes by the simple natural movement of placing the can top between the feeding and cutting wheels.

Other important advantages are achieved by providing a can opener of this type which operates after retention of the can to puncture the can automatically upon a momentary touch of a button, sever the can top, stop itself after the can top has been severed and support the can until removed by a simple effortless movement by the operator who may have performed other duties while the can was being opened.

Another important object resides in the provision of an opener of the character described in which all operating parts of the machine which may come in contact with the can or its contents are removable as a unit for cleaning purposes. Provision is made so that removal and replacement of the above mentioned operating unit may be accomplished simply and quickly by one having a minimum of manual dexterity or mechanical skill.

Other objects and advantages reside in the provision of improved mechanism for accomplishing the foregoing objects, such mechanism being simple, rugged and foolproof and capable of functioning satisfactorily in cans of various size and condition. For example, the machine is capable of functioning properly even with cans having irregular or dented rim beads.

Another important object is realized by the provision of a pivotally mounted operating plate that carries the cutting wheel, and by the provision of a cam means operatively connected to the power unit adapted to engage a follower on the operating plate upon energization of the power unit, the cam means automatically pivoting the



plate so as to puncture the can lid with the cutting wheel and move the cutting wheel into operative relation to the feeding wheel.

Other important advantages are realized by the provision of a guide means interconnecting the operating plate with the can opener body so as to direct the plate in its pivotal movement and hence direct the cutting wheel into operative relation to the feeding wheel.

Still other important advantages are realized by providing a detachable connection at the pivotal mounting of the operating plate so that the operating plate and its cooperating parts, such as the cutting wheel, can be readily removed as a unit for cleaning purposes.

Another important object is achieved by the provision of a cam means operatively connected to the electric power means and adapted to engage a cam follower to move such follower to an open-circuit position in which the follower actuates a switch in the electrical circuit so as to de-energize such circuit and said power means.

The provision of a plurality of cams mounted on a rotative axis and driven by the power means, the provision of a movably mounted follower adapted to move so that the follower engages selectively one of the cams, such cams causing the follower to move back toward the open-circuit position in successive stages upon consecutive engagement of the follower with the cams, thereby enabling the power means to rotate the feeding wheel for predetermined time periods before the power means is de-energized and rotation of the feeding wheel is halted.

Yet another important object is provided by the particular structural arrangement of the cam follower and by its initial engagement with the cam means so that the follower is adapted to close the switch and hence energize the electrical circuit before the follower can be operatively moved into the path of the cams for complete cycle operation of the can opener. This structure precludes unintentional operation of the can opener upon accidental or unintentional engagement with the plungers provided for operating such follower.

Another important object is realized by the provision of a plurality of plungers adapted to move the switch-actuating means selectively to different positions relative to the timing cams so that each plunger determines the time interval that the feeding wheel shaft rotates before the switch-actuating means is moved back to the open-circuit position by such cams and hence de-energizes the power means.

It is an important object of this invention to provide an electric can opener that is simple and durable in construction, economical to manufacture, efficient in operation, and which can be readily operated by anyone with the absolute minimum of effort.

The foregoing and numerous other objects and advantages of the invention will more clearly appear from the following detailed description of a preferred embodiment, particularly when considered in connection with the accompanying drawings, in which:

FIG. 1 is a top plan view of the can opener;

FIG. 2 is a front elevational view of the can opener;

FIG. 3 is a side elevational view of the can opener as seen from the left of FIG. 2;

FIG. 4 is a view of the internal mechanism of the can opener, partly in cross-section, as seen along line 4—4 of FIG. 3;

FIG. 5 is a front elevational view of the operating plate;

FIG. 6 is a fragmentary front elevational view of the can opener, similar to that shown in FIG. 2, but illustrating the operating plate in a raised inoperative position;

FIG. 7 is an enlarged, fragmentary view, partly in cross-section as seen along staggered line 7—7 of FIG. 6;

FIG. 8 is a fragmentary cross-sectional view of the timing wheel, electric switch, switch-actuating means and operating plungers, showing the first plunger depressed and the switch-actuating means moved to an operative position;

FIG. 9 is a view similar to that shown in FIG. 8, but illustrating the depression of a second plunger and the position of the switch-actuating means relative to the timing wheel;

FIG. 10 is a view similar to that shown in FIGS. 8 and 9, but illustrating the depression of the third plunger and the position of the switch-actuating means relative to the timing wheel, the open-circuit position of the switch-actuating means being shown in broken lines;

FIG. 11 is an enlarged, fragmentary view of the timing wheel and switch-actuating means as seen along line 11—11 of FIG. 4;

FIG. 12 is an enlarged, fragmentary view of the switch-actuating means and guide therefor as seen along line 12—12 of FIG. 8, and

FIG. 13 is a fragmentary view, partly in cross-section of the motor braking mechanism.

Referring now by characters of reference to the drawings, and first to FIGS. 1, 2 and 3 it is seen that the can opener includes an outer casing or housing 10 consisting of a front body 11 and a detachably connected rear body 12. The housing 10 is provided with a pair of legs 13 adapted to support the can opener on a subjacent surface such as a table or counter top.

The front body 11 is provided with a substantially flat vertical front surface 14 extending upwardly from its lower margin to an inwardly recessed body portion 15 at the top of the body 11.

Extending outwardly from one side of the front body 11 are a plurality of plungers 16, 17 and 18 a total of three in the embodiment disclosed, which can be selectively depressed to operate the can opener, all in the manner subsequently explained upon further description of parts. For convenience of the user, the plungers 16–18 inclusive are provided with reference numerals "1—2—3" immediately adjacent such plungers to indicate which plunger should be depressed for a particular size can.

Attached to the body 11 and located in the upper recessed portion 15 is an operating plate 20. Extending inwardly from one side of plate 20 is an elongate slot 21. A partially threaded pivot pin 22 is located in slot 21 and threadedly attached to the front body 11. The pivot pin 22 is constructed so as to retain the operating plate 20 against body 11 yet permit slidable movement of pin 22 in slot 21 upon pivotal movement of the operating plate 20 about such pivot connection.

A cutting wheel 23 is rotatively mounted on a shaft journalled in a bearing 24 that forms an integral part with operating plate 20. The cutting wheel 23 is located immediately above an inverted U-shaped recess 25 formed in the lower margin of plate 20. Located at one side of cutting wheel 23 and forming a part of the operating plate 20 is a flange 26 adapted to engage and position the top of the can when located in can-opening position.

A handle 27 is formed as an integral part of plate 20 at its upper end opposite the pivot connection of the plate. The handle 27 is gripped by the user in order to lift and lower the plate 20 about its pivotal connection incident to raising and lowering the cutting wheel 23 out of and into cutting position.

Formed in the body 11 immediately behind the plate 20 is a key-slot 30 having an enlarged upper portion 31 and narrow curvilinear portion 32. The plate 20 is provided with a button 33 on its rear face which is adapted to project through the enlarged slot portion 31 and slidably move in the narrow curvilinear slot portion 32. The key-hole slot 30 and its coacting plate button 33 constitute a guide means for directing movement of plate 20 as it is raised and lowered into and out of operative can-opening position about pivot pin 22.

Another slot 34 is formed in the body 11 immediately behind the plate 20. A follower pin 35 is attached to the operating plate 20 and extends rearwardly through the slot 34. The operation of the follower pin 35 and the purpose of slot 34 will become more apparent upon subsequent description of parts.

As is best seen in FIGS. 4 and 7, the power means consists of an electric motor 36 mounted within the housing 10 on the internal frame 37. Journalled in and extending through frame 37 is the drive shaft of motor 36. A drive gear 38 is attached to the motor drive shaft. A larger gear 40 attached to shaft 41, the shaft 41 being journalled on the frame 37, meshes with the drive gear 38. Another gear 42 smaller than gear 40 is attached also on the stub shaft 41 and is rotatable with the larger gear 40.

A feeding wheel shaft 43 is journalled in bearing 44 provided on the front wall of front body 11 and is journalled in the frame 37. A gear 45 is attached to the feeding wheel shaft 43 and is rotatable therewith, such gear 45 meshing with the gear 42. It is seen that the drive connection between the electric motor 36 and the feeding wheel shaft 43 is through the drive gear 38 meshing with gear 40 that rotates gear 42, and thence through gear 42 meshing with gear 45 attached to the feeding wheel shaft 43.

Attached to the outermost end of the feeding wheel shaft 43 is a feeding wheel 46. As will be apparent from FIGS. 2, 3 and 7, the feeding wheel 46 extends outwardly beyond the front face of operating plate 20 and is adapted to interfit the recess 25 provided in such plate 20 when the plate is lowered to its operative position.

To place the can in operative position relative to the can opener, the operating plate 20 is pivotally raised to the position illustrated in FIG. 6 in which the cutting wheel 23 is raised and spaced from the feeding wheel 46. Movement of the button 33 in the guide slot 30 and movement of follower 35 in guide slot 34 direct the plate 20 upwardly to this raised position. The slot 21 permits relative movement of pivot pin 22 upon raising. Then, the can rim is placed between the cutting wheel 23 and the feeding wheel 46. Simply by lowering the operating plate 20 manually or by letting it fall under gravity until the cutting wheel 23 engages the can lid, the can will be supported in position by such wheels 23 and 46. The can lid can then be punctured by the cutting wheel 23 by manually gripping the operating plate and lowering it to its fully closed position illustrated in FIG. 2.

However, the can opener is provided with means for automatically puncturing the can upon energization of the electric motor 36 in order to save this effort on the part of the user. The mechanism for performing this functional result includes a cam 47 attached to and rotatable with the feeding wheel shaft 43. When the motor 36 is energized and the feeding wheel shaft 43 is rotated, the cam 47 will engage the follower 35, and hence move the follower 35 and the operating plate 20 downwardly about its pivotal connection into the operative cutting position illustrated in FIG. 2. The guide slots 30 and 34 are provided with slightly curved lower portions which enable the plate 20 to shift laterally at its lower limit of movement so that the follower 35 can disengage operatively from the cam 47 to permit further unobstructed rotation of the feeding wheel shaft 43.

It is apparent that the interaction of cam 47 and follower 35 causes the cutting wheel 23 to be lowered automatically to its operative cutting position in which the can lid is punctured and in which the cutting wheel 23 will sever the can lid upon rotation of the can by the feeding wheel 46.

A timing wheel 50 is rotatively mounted on a bearing 51 attached to the front wall of body 11. As is best

seen in FIG. 7, the timing wheel 50 is provided with peripheral teeth in order to provide a gear that meshes with a gear 52 attached to the feeding wheel shaft 43. The timing wheel 50 is driven and rotated directly by the feeding wheel shaft 43.

Attached to one side face of the timing wheel 50 are a plurality of cams 53, 54 and 55, such cams being radially spaced outwardly from each other. The cams 53, 54 and 55 are radial spiral segments in configuration.

It is seen that upon rotation of timing wheel 50 the cams 54—55 operate to move a follower consecutively in steps outwardly from the rotative axis of timing wheel 50. In the embodiment disclosed, the front ends of the cams 53–55 are radially aligned. There is an approximate 270 degree rotation of wheel 50 between the last contact of the follower with one cam and the initial contact with the next cam. In other words, the cam 54 delivers the follower to a point where the next outermost cam 54 will engage the follower upon another revolution of the wheel 50, the cam 54 moving it out an additional distance so that the next cam 55 will engage the follower upon still another revolution of wheel 50 and move it outwardly an additional distance.

Pivotally mounted on lug 56 extending inwardly from the side of body 11 is an arm 57 constituting a switch-actuating means. A spring washer 60 is attached to the pivot pin forming the pivot connection and engages the arm 57 with a frictional pressure sufficient to prevent unintended movement of the arm 57 about such pivotal connection. The arm 57 extends upwardly from the pivotal connection to a region adjacent the timing wheel 50.

The arm 57 is provided with a flat uppermost end portion 61 that includes an in-turn tab 62 covered with an insulating sleeve.

A guide flange 63 extends inwardly from the side wall of body 11 and extends alongside the upper arm end 61. The flange 63 engages the upper arm end 61 and serves to guide such arm 57 in its pivotal movement. Located on the inner surface of flange 63 are a plurality of shoulders 64 adapted to engage the arm end 61 and hence facilitate location of the arm 57 in various desired positions by preventing over-travel or excessive inward movement of the arm 57.

Engagement between the timing wheel 50 and the arm 57 is accomplished through a follower pin 65 mounted on the arm 57 in a lost-motion relation. As is best seen in FIG. 11, the arm 57 is provided with a slot 66 in which the follower pin 65 is slidably mounted. A spring 67 has one end attached to arm 57 and the opposite end engaging the follower pin 65 tending to hold the pin 65 at the forward or left hand end (FIGS. 8–10 inclusive) of the slot 66 in the arm 57. The pin follower 65 can move to the other limit in slot 66 under spring loading and hence permit relative movement of the pin 65 and the switch-actuating arm 57, the purpose of which will be later explained.

An electrical circuit is operatively connected to the motor 36, such circuit including a switch 70. The switch 70 consists of a pair of spring arms 71 and 72, the spring arm 72 extending upwardly to a position in the path of arm tab 62. A pair of contacts 73 are carried by the spring arms 71 and 72, the resiliency of spring arms 71 and 72 tending to urge such contacts 73 together to a closed circuit position.

The plungers 16–18 inclusive mounted in the body 11, each consists of a rod 74 attached to a button 75 and a spring 76 engaging the button 75, the spring 76 tending to urge the plunger to an outermost position in which the rod 74 disengages operatively from the switch-actuating arm 57.

As will be apparent from FIGS. 8–10 inclusive, the plungers 16–18 inclusive are arranged in spaced relationship at different distances from the pivot axis of switch-actuating arm 57 so that depression of each plunger will cause engagement of the rod 74 of such plunger with the arm 57 at a point from the pivot axis of arm 57 different from any other plunger. This action of the plungers causes movement of the arm 57 to different locations depending upon which plunger is depressed.

In the initial starting position of switch-actuating arm 57, as is shown in broken lines in FIG. 10, the tab 62 engages the switch arm 72 and holds the contacts 73 apart, thus opening the electric circuit and deenergizing the motor 36. This is called the open-circuit position of switch-actuating arm 57. Furthermore, in this position the follower pin 65 engages the outermost land of the timing wheel cam 55. Whenever any of the plungers 16–18 inclusive are accidentally or unintentionally touched lightly the follower pin 65 engaging the outermost land of the timing wheel cam 55 under spring loading precludes unintentional movement of the arm 57 from the open-circuit position.

The rotor 77 of motor 36 is axially offset electrically with respect to the stator 80 so that upon energization of the motor 36, the rotor 77 is urged forwardly against the loading of spring 81.

The rear end of rotor 77 is provided with a friction liner 78. A strap member 82 overlaps the rear end of rotor 77 and carries on its inner face another friction liner 79. When the switch 70 is open and the electric circuit thereby opened, the motor 36 is deenergized, causing the spring 81 to urge the rotor 77 rearwardly so that its rear end abuts the overlapping strap 82, and hence causes immediate cessation of rotor rotation. More particularly, friction liners 78 and 79 on the overlapping strap 82 and the rotor end engage to provide this braking action.

The braking feature on the motor is important in that it predetermines the initial position of the cam 47 and also assures that the follower pin 65 stops on the outermost land of the timing wheel cam 55, all in preparation for full and complete cycle in subsequent operation.

It is desirable that the follower pin 65 stop at the terminal of and initially position on the outermost cam 55. The advantage is that slight pressure is required on any one of the plungers 16–18 in order to initiate operation of the device, and thereby the engagement of pin 65 on cam 55 precludes unintended actuation of the plunger through casual contact.

It is thought that the operation and functional advantages of the electric can opener have become fully apparent from the foregoing description of parts, but for completeness of disclosure a full cycle of operation will be briefly described.

In the initial position, the switch-actuating arm 57 is located as is illustrated in broken lines in FIG. 10, the tab 62 engaging the switch arm 72 and holding the switch 70 open. Further, the follower pin 65 is in engagement with the outermost land of the timing wheel cam 55.

The can to be opened is located in proper position with its uppermost bead between the cutting wheel 23 and the feeding wheel 46, the operating plate 20 being raised to permit the can insertion. After insertion of the can, the operating plate is released so that the cutting wheel 23 rests on the top of the can lid. The cutting wheel 23 and the feeding wheel 46 now support the can for subsequent lid-removing operation.

Depending upon the size of the can, one of the plungers 16–18 is selectively depressed. Assuming first that it is a small size can, the uppermost plunger 16 is depressed. Upon depression, the arm 57 is pivotally moved so that tab 62 permits the switch arm 72 to move forwardly and cause engagement of switch contacts 73. Until there is actual electrical connection of switch contacts 73, the follower pin 65 engages the timing wheel cam 55 and is moved under loading of spring 67 along the slot 66. At the instance the switch contacts 73 are closed, the electrical circuit and hence the motor 36 are energized causing rotation of the rotor 77.

As stated previously, the rotor 77 moves axially forward under loading of spring 81 to cause operative disengagement of the braking means and operates through the gear train 38, 40, 42 and 45 to rotate the feeding wheel shaft 43. As the feeding wheel shaft 43 is rotated, the drive gear 52 causes rotation of timing wheel 50 in a counterclockwise direction as viewed in FIGS. 8–10 inclusive. Upon rotation of the timing wheel 50, the outermost timing wheel cam 55 will disengage operatively from the follower pin 65. Because there is a continuing pressure on the plunger 16 upon depression of the operator, the switch-actuating arm 57 is moved about its pivotal connection so that the follower pin 65 is in the path of the outermost timing wheel cam 55.

Simultaneously, as the feeding wheel shaft 43 rotates, the cam 47 mounted thereon will rotate and engage the plate follower 35, thereby moving the plate 20 downwardly to the position illustrated in FIG. 2 in which the cutting wheel 23 punctures the can lid. As stated previously, the curvilinear slots 30 and 34 permit movement of the follower 35 out of the path of cam 47 when the plate 20 is fully lowered so as to permit continued rotation of feeding wheel shaft 43.

Upon continued rotation of feeding wheel shaft 43, the feeding wheel 46 cooperates with the cutting wheel 23 to sever the can lid in the manner that is well known.

As the timing wheel 50 makes one revolution, its outermost cam 55 will engage the follower pin 65 and move the switch-actuating arm 57 back to the open-circuit position illustrated in broken lines in FIG. 10. In being moved back to the open-circuit position by timing wheel cam 55, the tab 62 engages the switch spring arm 72 and causes disengagement of switch contacts 73, thereby opening the electrical circuit and deenergizing the motor 36.

When the motor 36 is deenergized, the braking means immediately halts rotation of rotor 77 and consequently immediately halts rotation of cam 47 and timing wheel 50. The cam 47 is halted in a position so as to permit a raising of the operating plate 20 without interference of the follower 35 with cam 47 in order to insert a can for opening operation. Furthermore, the timing wheel 50 is halted in a position such that the outermost land of the timing wheel cam 55 engages the follower pin 65. All parts of the can opening mechanism are now back in their initial position for another cycle of operation.

When the second plunger 17 is depressed, a somewhat similar action takes place to that described previously, the important difference being that the switch-actuating arm 57 is moved out of the open-circuit position a further distance, as is illustrated in FIG. 9. In this pivoted position, as determined upon depression of plunger 17, the follower pin 65 is located in the path of the timing wheel cam 54. Upon rotation of the timing wheel 50, the cam 54 will engage the follower pin 65 and move such pin 65 and hence the arm 57 in a direction toward the open-circuit position. However, as the timing wheel cam 54 disengages the follower pin 65, the pin 65 is left in the path of the next outermost cam 55 so as to be engaged by such cam 55 upon the next revolution of wheel 50. As the wheel 50 makes a second revolution, the cam 55 engages the follower pin 65 and moves the switch-actuating arm 57 back to the open-circuit position, illustrated by broken lines in FIG. 10.

Upon depression of the second plunger 17, the timing wheel 50 takes two complete revolutions before moving the switch-actuating arm 57 back to the open-circuit position. This action means that the feeding wheel 46 is rotated twice the number of revolutions as is accomplished upon depression of the first plunger 16, thereby permitting a larger can to be opened.

A similar action occurs upon depression of the third plunger 18, as is shown in FIG. 10. When the plunger 18 is depressed, the switch-actuating arm 57 is pivotally moved out of the open-circuit position to a position in which the follower pin 65 is located in the path of the innermost timing wheel cam 53. After the first revolution of timing wheel 50, the timing wheel cam 53 engages the follower pin 65, moving the pin 65 a step toward the open-circuit position, but leaving the pin 65 in the path of the next adjacent cam 54 upon disengagement. After the second revolution of the timing wheel 50, the cam 54 engages the follower pin 65 moving it another step toward the open-circuit position, but leaving the pin 65 in the path of the outermost cam 55. Then, as the timing wheel 50 makes the third and final revolution, the cam 55 engages the follower pin 65 and moves the switch-actuating arm completely back to the open-circuit position.

Again it is seen that the feeding wheel 46 makes three times as many revolutions upon depression of plunger 18 as it does when the plunger 16 is depressed.

By reason of their relative positions from the pivotal axis of the switch-actuating arm 57, depression of the third plunger 18 moves the arm 57 inwardly to a point where the follower pin 65 will engage the innermost cam 53 of the timing wheel 50, such action effecting three revolutions of the timing wheel before the motor 36 is deenergized. The middle plunger 17 moves the follower pin 65 inwardly to engage the intermediate or second cam 54 for two revolutions of the timing wheel 50. The uppermost plunger 16 moves the follower pin 65 inwardly to engage the outermost cam 55 and hence effect one revolution of the timing wheel 50. This mechanism provides for sufficient operation of the feeding wheel 46 in order to open either a small, middle size or large can.

Another purpose for that lost-motion arrangement between pin 65 and the switch-actuating arm 57 is that it allows any of the plungers 16–18 to be held in a depressed position without interfering with cam and follower operation. In other words, the cam 55 on the timing wheel 50 engages the follower pin 65 and moves it inwardly relative to the arm 57. Holding a plunger in, in this manner, merely causes consecutive cycling of the device.

After the can lid is punctured and severad, the can is removed by merely lifting the operating plate 20 from the position shown in FIG. 2 to the position illustrated in FIG. 6.

To clean the cutting wheel 23 and the operating plate 20, the pivot pin 22 is threadedly disconnected and removed. Then, the plate is moved upwardly so that the button 33 is located in the enlarged slot portion 31 of key-hole slot 30. In this position, button 33 can be removed from key-hole slot 30 and follower 35 can be removed from slot 34, thus enabling complete removal of the plate 20 and the cutting wheel 23. After these parts have been cleaned, the plate 20 can be readily reconnected by simply reversing the above described steps.

Although the invention has been described by making detailed reference to a single preferred embodiment, such detail is to be understood in an instructive, rather than in any restrictive sense, many variants being possible within the scope of the claims hereunto appended.

I claim as my invention:

1. In a can opener, a body member, a feeding wheel mounted on said body member, an operating plate member, the plate member being provided with an elongate aperture, a pivot pin detachably connected to said body member and extending through said aperture, the plate member being swingable about said pin, one of said members being provided with a slot, a follower on the other said member and disposed in said slot, a cutting wheel mounted on said plate member, said slot and follower interconnecting the plate member and body member for directing pivotal movement of said plate member incident to moving the cutting wheel into and out of operative relation to said feeding wheel.

2. In a can opener, a body, a feeding wheel shaft extending through said body, a feeding wheel attached to

said shaft, means for rotating said shaft, a cam attached to said shaft and rotatable therewith, an operating plate, said plate being provided with an elongate aperture, a pivot pin detachably connected to said body and extending through said aperture, the plate being swingable about said pin, a cutting wheel mounted on said plate and movable into and out of operative relation to said feeding wheel upon pivotal actuation of said plate, the body being provided with a slot, a follower attached to said plate and extending through said slot, said cam engaging said follower upon rotation of said feeding wheel shaft to pivot the plate and move the cutting wheel into operative relation to said feeding wheel, said slot including a portion guiding the follower out of the path of said cam when the cutting wheel is moved to its operative position relative to the feeding wheel.

3. In a can opener, a body, a feeding wheel shaft mounted on said body, power means operatively connected to said shaft, camming means rotatively mounted in said body and operatively connected to said power means for rotation, an electrical circuit operatively connected to said power means, a switch in said circuit, a switch-actuating means in one position holding said switch in an open-circuit position, said switch-actuating means including a follower, and means for moving said follower into the path of said camming means and at the same time moving said switch-actuating means out of said one position so that said switch is moved into a closed-circuit position, said camming means engaging said follower to move the switch-actuating means back to the said one position to hold the switch in the open-circuit position.

4. In a can opener, a body, a feeding wheel shaft mounted on said body, an electric power means, a drive connection between said power means and said shaft, a timing wheel rotatively mounted in said body, means drivingly connecting said wheel with said shaft, camming means on said wheel, an electrical circuit operatively connected to said power means, a switch in said circuit, a switch-actuating means in one position holding said switch in an open-circuit position, said switch-actuating means including a follower, and means for moving said follower into the path of said camming means at the same time moving said switch-actuating means out of said one position so that said switch closes said circuit, said camming means engaging said follower to move the switch-actuating means back to the said one position to hold the switch in the open-circuit position.

5. In a can opener, a body, a feeding wheel shaft mounted on said body, power means operatively connected to said shaft, camming means operatively mounted in said body and operatively connected to said power means for rotation, an electrical circuit operatively connected to said power means, a switch in said circuit having a pair of contacts, an arm pivotally mounted and in one position engaging one of said contacts so as to hold the switch in an open-circuit position, means for pivoting said arm out of said one position so as to disengage said contact and close said circuit, and a follower on said arm engaging said camming means to pivot the arm back into said one position and into engagement with the said one contact so as to open the circuit.

6. In a can opener, a body, a feeding wheel shaft mounted on said body, power means operatively connected to said shaft, a plurality of rotatively mounted camming elements, means operatively connecting the camming elements with said power means for rotation, an electrical circuit connected to said power means, a switch in said circuit, a switch-actuating means in one position holding said switch in an open-circuit position, and means for moving said switch-actuating means out of said one position so that said switch is moved to a closed-circuit position, the switch-actuating means being moved selectively into the path of said camming elements, the switch-actuating means engaging said camming elements consecutively to move the said means in steps back toward the said one position.

7. In a can opener, a body, a feeding wheel shaft mounted on said body, power means connected to said shaft, a plurality of rotatively mounted cam elements, means operatively connecting the cam elements with said power means, an electrical circuit connected to said power means, a switch in said circuit, a switch-actuating means in one position holding the switch in an open-circuit position, and means for moving said switch-actuating means out of said one position and into the path of one said cam element so that said switch is movable to a closed-circuit position, said cam elements including camming surface staggered at different distances from the same rotative axis, said switch-actuating means engaging said cam elements consecutively to move said means back toward the said one position so as to hold the switch in the said open-circuit position.

8. In a can opener, a body, a feeding wheel shaft mounted on said body, power means operatively connected to said shaft, a timing wheel rotatively mounted in said body, a plurality of cams on said wheel radially spaced outwardly, each cam being substantially a spiral segment, means operatively connecting the timing wheel with said power means, an electrical circuit connected to said power means, a switch in said circuit, a switch-actuating means in one position holding the switch in an open-circuit position, and means for moving said switch-actuating means away from the said one position and into the path of said cams so that said switch is moved to a closed-circuit position, said cams engaging the switch-actuating means consecutively upon rotation of said timing wheel, the wheel rotating a distance between the last contact of the switch-actuating means with one cam and the initial contact with next succeeding outwardly located cam so as to move the switch-actuating means back to said one position so as to hold the switch in the open-circuit position.

9. In a can opener, a body, a feeding wheel shaft mounted on said body, power means operatively connected to said shaft, a timing wheel rotatively mounted in said body, a plurality of cams on said wheel radially spaced outwardly from its rotative axis, each cam being substantially a spiral segment, means operatively connecting the timing wheel with said power means, an electrical circuit connected to said power means, the switch in said circuit having a pair of contacts, an arm pivotally mounted and in one position engaging one of said contacts so as to hold the switch in an open-circuit position, means for pivoting said arm out of said one position so as to disengage said contact and close said circuit, and a follower on said arm movable into the path of said cams when the arm is moved out of said one position, the cams engaging said follower consecutively so as to move the arm back into the said one position so as to hold the switch in the open-circuit position.

10. In a can opener, a body, a feeding wheel shaft mounted on said body, power means operatively connected to said shaft, a cam rotatively mounted in said body and operatively connected to said power means for rotation, an electrical circuit operatively connected to said power means, a switch in said circuit, switch-actuating means including a follower engaging the cam to maintain the switch-actuating means in a position to hold the switch open, resilient means mounting said follower to permit limited movement under loading upon pressure against said cam as the switch-actuating means is urged away from the said one position so as to close said switch, the follower operatively disengaging from said cam upon cam rotation and movable into the path of said cam as the switch-actuating means is moved out of said one position, said cam engaging said follower to move the switch-actuating means back to the said one position.

11. In a can opener, a body, a feeding wheel shaft

mounted on said body, power means operatively connected to said shaft, a cam rotatively mounted in said body and operatively connected to said power means for rotation, an electrical circuit operatively connected to said power means, a switch in said circuit, a movably mounted arm operatively engaging said switch, said arm being provided with a slot, a follower in said slot, a spring engaging said follower and resiliently urging the follower to one limit in said slot, said follower engaging said cam so that said arm in one position holds said switch in an open-circuit position, said follower being movable relatively in said slot under spring loading upon movement of said arm away from the said one position so as to close said circuit, the follower operatively disengaging from said cam upon cam rotation and movable into the path of said cam as the arm is moved out of said one position, said cam engaging said follower to move the arm back to the said one position.

12. The combination and arrangement of elements as recited above in claim 11, but further characterized by the provision of a timing wheel rotatively mounted in said body, and means drivingly connecting said timing wheel with said shaft for rotation of said timing wheel, said cam being on said wheel and rotatable therewith.

13. The combination and arrangement of elements as recited above in claim 11, but further characterized by the provision of plunger means engaging said arm for selectively moving said arm out of said one position and for moving the follower into the path of said cam for subsequent engagement by said cam to move the arm back to the said one position.

14. In a can opener, a body, a feeding wheel shaft mounted on said body, power means operatively connected to said shaft, a plurality of rotatively mounted cams, means operatively connecting the cams with said power means for rotation, an electrical circuit connected to said power means, a switch in said circuit, a switch-actuating means including a follower engaging one of said cams to maintain the switch-actuating means in a position in which the switch-actuating means holds the switch open, resilient means mounting said follower to permit limited movement under loading upon pressure against the last said cam as the switch-actuating means is urged away from the said one position so as to close said switch, the follower operatively disengaging from the last said cam upon cam rotation, and means for moving the switch-actuating means out of said one position to place said follower into the path of said cams, said cams engaging the follower consecutively to move the switch-actuating means back toward the said one position.

15. In a can opener, a body, a feeding wheel shaft mounted on said body, power means operatively connected to said shaft, a timing wheel rotatively mounted in said body, means operatively connecting the timing wheel with said power means for rotation, a plurality of cams on said wheel radially spaced outwardly from its rotative axis, each cam being substantially a spiral segment, an arm movably mounted in said body, said arm being provided with a slot, a follower in said slot, a spring engaging said follower and resiliently urging the follower to one limit in said slot, said arm in one position holding said switch in an open-circuit position while said follower engages one of said cams, said follower being movable in said slot under spring loading upon pressure against said cam as the arm is urged away from the said one position so as to close said switch, the follower operatively disengaging from the last said cam upon rotation of said timing wheel, and means for moving said arm to another position to place the follower in the path of said cams, said cams consecutively engaging the follower to move the arm toward the said one position.

16. In a can opener, a body, a feeding wheel shaft mounted on said body, power means operatively connected to said shaft, camming means rotatively mounted in said body and operatively connected to said power means for rotation, an electrical circuit operatively connected to said power means, a switch in said circuit, a switch-actuating means in one position holding said switch in an open-circuit position, said switch-actuating means including a follower, a plunger engaging said switch-actuating means to move said switch-actuating means out of said one position to close said switch and at the same time to move said follower into the path of said camming means, said camming means engaging said follower to move the switch-actuating back to said one position so as to open said switch.

17. In a can opener, a body, a feeding wheel shaft mounted on said body, power means operatively connected to said shaft, a plurality of rotatively mounted cams, means operatively connecting the cams with said power means for rotation, an electrical circuit connected to said power means, a switch in said circuit, an arm pivotally mounted in said body and in one position holding said switch in an open-circuit position, a follower on said arm, and a plurality of plungers engaging said arm, each plunger moving the arm a different distance out of the said one position and moving the follower into the path of a different cam, said cams engaging said follower consecutively to move the arm back to the said one position.

18. The combination and arrangement of elements as recited above in claim 17, but further characterized by the provision of a timing wheel rotatively mounted in said body and operatively connected to said power means for rotation, said cams being mounted on said timing wheel and radially spaced outwardly from its rotative axis, each cam being substantially a spiral segment, said cams engaging the follower consecutively to move the arm toward the said one position.

19. In a can opener, a body, a feeding wheel shaft mounted on said body, power means operatively connected to said shaft, a timing wheel mounted in said body, means operatively connecting said timing wheel with said shaft for rotation, an electrical circuit operatively connected to said power means, a switch in said circuit, an arm pivotally mounted in said body and in one position engaging said switch to hold the switch in an open-circuit position, the arm being provided with a slot, a follower slidably mounted in said slot, a spring engaging said follower and urging said follower to one limit in said slot, the timing wheel being provided with a plurality of cams radially spaced outwardly from the rotative axis of said wheel, each cam being substantially a radial spiral segment, and a plurality of plungers mounted on said body and engaging the arm at different distances from the pivotal axis of said arm, said plungers being adapted to move the arm out of the said one position to close the switch as the follower engages one of said cams under spring loading, the follower disengaging from the last said cam upon rotation of said timing wheel when the electrical circuit is energized, said plungers being adapted to move the arm selectively to different distances away from the said one position and move the follower into the path of any one of said cams, said cams engaging the follower consecutively so as to move the arm back to the said one position.

20. In a power operated can opener of the type having an electric rotary drive means and a feed wheel connected with said drive means and rotated in response to energization of said drive means, the combination therewith of switch means electrically connected with said drive means and operable to energize same whereby to initiate rotation of said feed wheel, and mechanism actuated responsive to the rotation of said feed wheel and operable to deenergize said drive means upon completion of a selected number of revolutions of said feed wheel following energization of said drive means, said mechanism including a camming member driven by said drive means, and a control element engaged by said camming member, said control element operable to cause the deenergization of

said drive means upon a selected degree of movement of said camming member.

21. In a power operated can opener of the type having an electrically powered rotary drive means and a feed wheel connected with said drive means and rotated in response to the energization of said drive means, the combination therewith of a rotary member connected with and driven by said drive means upon energization of the latter, an eccentric camming surface on said member a movable control element having a portion thereof adapted to be operatively coupled with said surface whereby movement of said control element takes place upon rotation of said member, and means conditioned by said



control element and operable to deenergize said drive means following a selected increment of movement of said control means in response to rotation of said member.

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