Oct. 29, 1957 H. C. SUNDELL 2,810,952

POWER DRIVEN CAN OPENER

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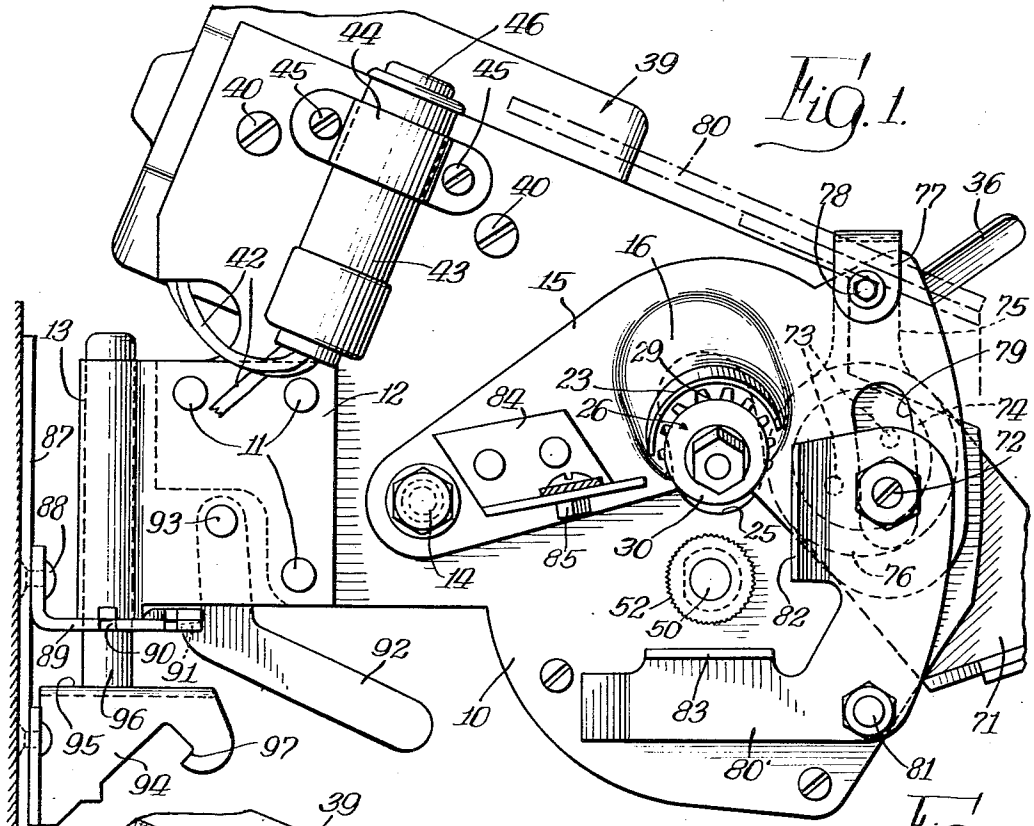


Fig. 1.

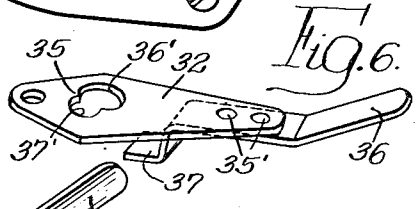


Fig. 6.

Fig. 2.

INVENTOR.
Harold C. Sundell,
BY John P. Smith
Atty.

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Fig. 3.

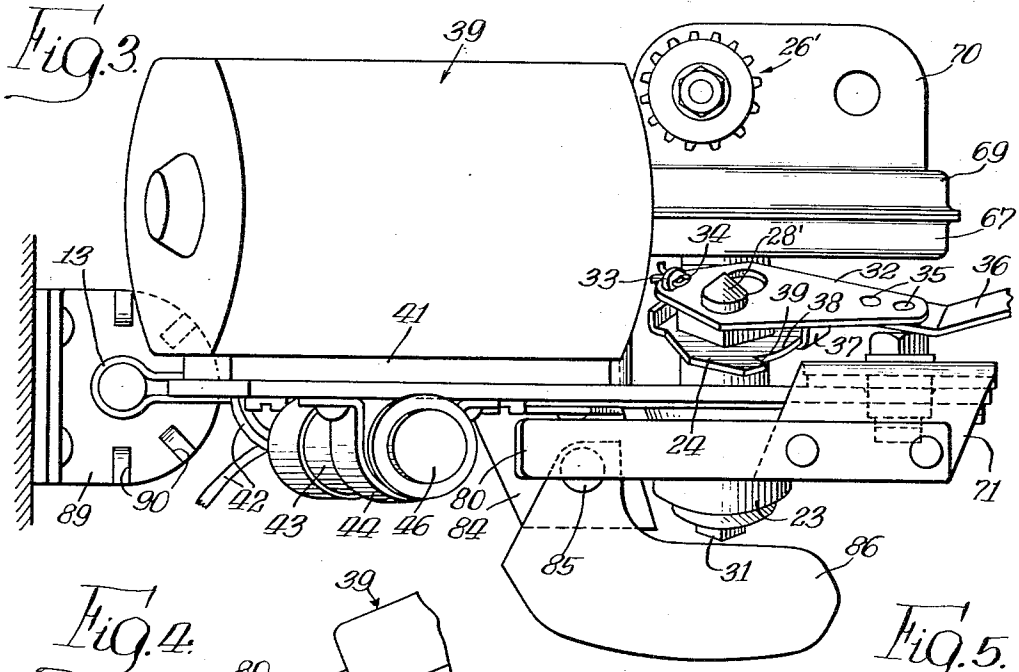


Fig. 4.

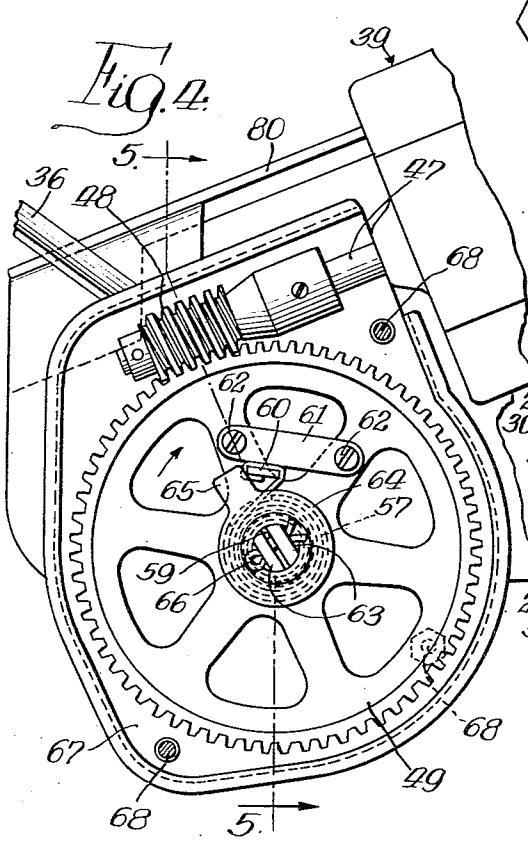
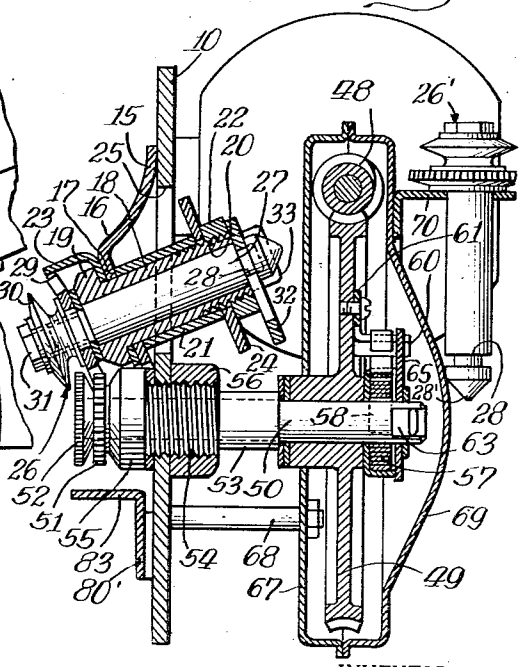


Fig. 5.



INVENTOR.

Harold C. Sundell

BY John P. Smith

Atty.

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POWER DRIVEN CAN OPENER

Harold C. Sundell, Hollywood, Fla., assignor to Frank J. Curran, Downers Grove, Ill.

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4 Claims. (Cl. 30—4)

The present invention relates generally to a novel and improved power driven can opener, but more particularly to a rugged and durable as well as simplified construction for efficient operation of the same.

One of the primary objects of the present invention is to provide a novel and improved power driven can opener in which a flexible connection operatively connects an electric motor with the driven cutter mechanism in such manner as will permit the motor to revolve a plurality of revolutions before the cutter is actuated or driven to thereby reduce to a minimum the size of electric motor required and to avoid breakage of the operative parts or drive connections.

Another object of the invention is to provide a novel and improved power driven can opener in which the driving connection between the electric motor and the driven cutting mechanism effects a positive drive when the motor reaches its maximum momentum or torque.

A further object of the invention is to provide a novel and improved power driven can opener in which an easily detachable cutter mechanism permits easy changing of the cutter so as to quickly substitute other cutters for opening such cans as dog food, paint or other cans other than food cans.

A further object of the invention is to provide a novel and improved power driven can opener in which a pivot bracket pivotally supports the can opener proper in different pivoted positions and automatically locks the opener in various angular positions with respect to the pivoted bracket.

These and other objects are accomplished by providing a construction and an arrangement of the various parts in the manner hereinafter described and particularly pointed out in the appended claims.

Referring to the drawings:

Fig. 1 is a fragmentary side elevational view of my improved can opener with the lever actuated to separate the cutting mechanism and the feeding mechanism;

Fig. 2 is a similar fragmentary side elevational view showing the lever actuated to move the cutting mechanism in operative position with respect to the feeding mechanism;

Fig. 3 is a top plan view of the same;

Fig. 4 is a fragmentary side elevational view with the cover removed showing the driving mechanism;

Fig. 5 is a cross-sectional view taken on the line 5—5 in Fig. 4; and

Fig. 6 is a detail perspective view of the cutter mechanism lock lever.

In illustrating one form my invention may assume in practice, I have shown the same as comprising a main frame member 10 made from a flat sheet of suitable metal such as aluminum or the like. Secured to one end of the main frame 10 by means of bolts 11 is a hinge member 12 which is formed of a single piece of metal with two spaced apart wings thereof engaging the opposite sides of the frame 10 with an outer portion formed into a cylindrical sleeve, as shown at 13, for engaging the hinge

pin hereinafter described. Pivoted to an intermediate portion of the main frame 10 by means of a bolt 14 is a knife mechanism supporting arm 15. An intermediate portion of the arm 15 has outwardly depressed dome-like portion, shown at 16, which terminates in an apertured flat portion 17 located at an angle of substantially thirty degrees with respect to the vertical as clearly shown in Fig. 5 of the drawings. Secured in the aperture of the portion 17 is a bearing sleeve 18 which has an annular flanged collar 19 on one end thereof and an externally threaded portion 20 on the other end thereof. Embracing the sleeve 18 is a spacer tube 21. The bearing sleeve 18 is secured to the apertured portion 17 of the arm 15 by a nut 22 mounted in threaded engagement with a threaded portion 20 of the sleeve 18. Clamped between the annular flange 19 of the sleeve 18 and the apertured portion 17 of the arm 15 is an arcuate shield 23. Clamped between the nut 22 and the inner end of the spacer tube 21 is a hinge and lock bracket 24. The sleeve 18 and spacer tube 21 extend angularly through an arcuately arranged opening 25 in the main frame 10, as clearly shown in Fig. 5 of the drawings. Removably mounted in the angularly disposed bearing sleeve 18 is a quickly detachable cutting mechanism, generally indicated by the reference character 26. This cutting mechanism includes a shaft 27 which has an annularly grooved recess adjacent its inner end, as shown at 28, for the purpose hereinafter described. The end of the shaft terminates in a tapered end 28'. Journaled on a reduced diameter and on the outer end of the shaft 27 is a gear wheel 29. Formed integrally with the gear wheel 29 or secured thereto is a disc cutter knife 30. The gear wheel 29 and disc 30 are rotatably retained on the shaft 27 by a bolt 31 mounted in threaded engagement with the internally threaded end of the shaft 27. The cutting mechanism 26, together with its shaft 27, is detachably retained in the bearing 18 by a lever 32. The lever 32 is pivoted on a laterally projecting post 33 formed integrally with the bracket 24 and is retained thereon by a cotter pin 34. An intermediate portion of the lever 32 is provided with a keyhole slot 35 in which the larger diameter aperture of the keyhole slot, as shown at 36', will freely receive the shaft 27 and a smaller aperture, as shown at 37', will engage the annular recess 28 of the shaft 27 to detachably retain the cutting mechanism in position in its bearing 18. Secured to the outer free end of the lever 32 by means of rivets 35' is an outwardly projecting slightly bent lever extension 36. The inner end of the lever extension 36 has an angularly disposed L-shaped extension 37 which is guided and moves about an arcuate edge 38 of the bracket 24. The movement of the lever 32 is limited by stops 39 located at the opposite ends of the guide arc 38.

From the above description it will be readily seen that when the cutter arm support 15 is raised, the cutting mechanism 26 is lifted away from the driving gear to the position shown in Fig. 1 of the drawings. When the cutting mechanism is lifted away from the driving gear 52, the lever 36 is then actuated upwardly so that the keyhole slot 35 in the lever 32 will permit the cutting mechanism 26 together with a shaft 27, to be readily removed from its bearing so that a substitute cutting mechanism, as indicated at 26', may be inserted in place thereof so that different cutting mechanisms may be used for cutting cans other than food.

Another important feature of my present invention includes a novel flexible drive mechanism interposed between the electric motor and the driven operative parts of the can opener which will permit the motor to reach its normal predetermined R. P. M. before it is positively connected to drive the cutting mechanism to thereby permit the use of a relatively smaller fractional horse-

power motor than would be ordinarily required. This mechanism includes a conventional electrical motor, generally indicated by the reference character 39, which is angularly disposed and secured to one side of the main frame 10 by means of bolts 40. The motor 39 is held spaced from the main frame 10 by a spacer bar 41. The electric motor 39 is adapted to be connected to a source of electrical energy by suitable wires 42 which are connected into a conventional type of electrical switch 43. This switch is positioned at substantially right angles to the longitudinal axis of the motor 39 and is secured to the main frame 10 opposite the motor by a clamp bracket 44 which, in turn, is secured to the frame by bolts 45. Mounted in the top portion of the switch 43 is a depressable switch member 46 which is located in an easily accessible position so that the thumb or forefinger of the operator may depress the switch member 46 when operating the lever hereinafter described is manipulated by the hand of the operator. The electric motor 39 is provided with the usual drive shaft 47. Secured to the outer end of the shaft 47 is a worm 48. The worm 48 meshes with and operatively drives a worm wheel 49. The worm wheel gear 49 is journaled on a shaft 50. Adjacent the outer end of the shaft 50 and secured thereto is a gear 51 which is adapted to engage and mesh with the gear 29 of the cutting mechanism 26. Secured or formed integrally with the gear 51 is a can feed wheel 52 which has its periphery roughened or serrated for engaging and revolving the can as the same is being cut in the manner well understood in the art. The shaft 50 is journaled in a bearing sleeve 53. One end of the sleeve 53 has a relatively larger diametral portion 54 which is externally threaded. Formed integrally with the threaded portion and sleeve 53 is an enlarged annular flange portion 55. The bearing sleeve 53 is secured in an aperture in the main frame 10 by a nut 56 mounted in threaded engagement with the threaded portion 54 of the sleeve. The other end of the shaft 50 is flexibly connected to the gear wheel 49 by a helically coiled spring 57 which has its inner end secured to the shaft 50 by having the inner end bent as shown at 58 and inserted in a transversely positioned slot 59 in the end of the shaft 50. The outer end of the spring 57 is secured to a laterally extending lug 60 which is formed integrally with a bracket 61. The bracket 61 is secured to the worm wheel 49 by bolts 62. Secured to the oppositely flattened end of the shaft, as shown at 63, is a drive disc 64. Formed integrally with the drive disc 64 is a radially projecting arm 65 which lies in the path of and is adapted to be engaged by the laterally projecting lug 60 carried by the worm wheel 49, when the worm wheel 49 is driven through an angular magnitude of approximately three hundred sixty degrees in a clockwise direction, as viewed in Fig. 4 of the drawings. In this connection it will be noted that as the worm wheel 49 is thus revolved by the motor, the spring 57 will yield to permit the motor to attain its maximum R. P. M., at which time the lug 60 carried by the gear 49 will also travel approximately one revolution before it engages the opposite side of the arm 65 to positively drive the can feeding and cutting mechanism 26.

When the can to be cut is placed between the cutting wheel 30 and feed wheel 50, sufficient resistance is offered by the can to permit the spring 57 to be coiled under tension and when the top of the can is completely cut, the spring has sufficient tension to rotate the shaft 50 three hundred sixty degrees so that the arm 65 returns to its initial position in engagement with the lug 60 as shown in Fig. 4 of the drawings.

From the above description it will be obvious that when the can is inserted in position to have the top severed therefrom, the electric motor 39 may rotate the worm wheel through an angular magnitude of substantially three hundred sixty degrees in a clockwise direction as indicated by the arrow in Fig. 4 of the drawings before the other side of the driving lug 60 contacts the other side of the arm 65 to thereby drive the cutting mechanism.

Obviously from the above construction, the flexible connection or spring 57 connected between the motor and the driven operating parts of the can opener permits the electric motor to revolve approximately one hundred revolutions freely so that the full power of the motor is attained before the necessary torque is required for driving the cutter through the top of the can, thereby reducing to a minimum the size of motor required for this purpose. The driving disc 64 is retained in position on the end of the shaft 50 by a cotter pin 66 extending through an aperture in the outer end of the shaft 50. The gears 48 and 49 are enclosed in a housing 67 which is held spaced from and parallel to the main frame member 10 by spacer bolts 68. A housing cover plate 69 is removably secured to the housing member 67 by certain of the spacer bolts 68. A right angularly disposed apertured bracket 70 is secured to the side of the cover 69 and is adapted to support therein a reserve cutting mechanism shown at 26' in Figs. 3 and 5 of the drawings. The cutting mechanism supporting arm 15 is actuated about its pivot 14 from the position shown in Fig. 1 of the drawings to that shown in Fig. 2 of the drawings by an operating cam lever 71. This cam lever 71 is pivoted on the bolt 72. Secured to the cam lever 71 by means of rivets 73 is a cam 74 in the form of a circular disc. In this connection it will be noted that the circular disc cam 74 is pivoted on and located eccentrically with respect to the pivot bolt 72. Operatively encircling the cam disc 74 is a link or pitman connection 75 which has an annular ring 76 encircling the disc 74. The link connection or pitman 75 has an upwardly extending and bent over portion so as to form spaced apart apertured parts 77 which are adapted to receive a bolt 78 for pivotally securing the link 75 to the outer or free end of the swinging arm 15 as clearly shown in Figs. 1 and 2 of the drawings. The outer or free end of the pivoted supporting arm 15 is provided with an arcuate slot 79 so that the arm 15 may move freely arcuately about the bolt 72 of the lever 71. Secured to the outer end of the operating cam lever 71 is a hand lever extension 80 so that the same may be grasped by the hand of the operator thereof for actuating the cutting mechanism into its operative position or from the position shown in Fig. 1 to the position shown in Fig. 2 of the drawings. At the same time that the lever 80 is depressed, the switch member 46 may be depressed by the thumb of the operator's hand. Secured in position below and forwardly of the feed wheel 52 and the cutting mechanism 26 is a generally L-shaped can guide and wheel guard 80'. This member 80' is suitably spaced from an secured to the main frame member 10 by the bolt 72 and an additional bolt 81. This guard member has a vertically disposed and laterally offset shoulder or flange portion 82 for exerting a laterally directed force on the can at a point spaced forwardly of the adjacent cutting mechanism. The member 80' has a horizontally disposed flange 83 which is adapted to engage the circular side of the can as the top is being cut. Secured adjacent the inner end of the supporting arm 15 is an angularly disposed bracket 84 on which is loosely supported by means of a bolt 85 a magnetic bracket 86 which, in turn, floatingly contains the conventional magnet (not shown) for engaging and retaining the cut can top after it is severed.

My novel hinge bracket for supporting the power driven can opener includes a vertical plate 87 which is adapted to be secured to the wall or any other convenient location. Secured to the bracket or plate 87 by means of a rivet 88 is a semi-circular member 89 which has a plurality of uniformly spaced apart upwardly depressed recesses 90 located on the periphery of the semi-circular member for the reception of the pointed end 91 of a gravity actuated latch 92. The upper end of the gravity

latch 92 is pivoted, as shown at 93, to the oppositely disposed plates of the hinge member 12. Obviously the handle of the latch member 92 is offset so as to automatically lock the latch in any one of these recesses 90 with the can opener properly positioned and the latch member released. Secured to the lower end of the plate 87 is a spaced apart or bifurcated bracket 92 having a horizontal portion 95 to which the pivot pin 96 is secured for receiving the sleeve portion 13 of the hinge bracket 12. The lower end of the bracket member 92 is provided with a conventional form of bottle cap remover device of the construction well known in the art.

Summarizing the construction and function of operation of my improved power drive can opener, it will be readily understood that by arranging a flexible or yielding connection between the electric motor and the driven cutting mechanism, the possibility of breakage of the operating parts is not only eliminated, but also the spring connection at this point permits the electric motor to attain its maximum power or R. P. M. before it is required to actuate the cutting mechanism, thereby requiring a considerably smaller motor than would be ordinarily necessary.

It will be further noted from the foregoing description of my improved can opener that facilities are provided for easily removing one cutting mechanism and quickly substituting a different one for various uses.

While in the above specification I have described one embodiment which my invention may assume in practice, it will, of course, be understood that the same is capable of modification and that such modification may be made without departing from the spirit and scope of the invention as expressed in the appended claims.

What I claim as my invention and desire to secure by Letters Patent is:

1. A motor driven can opener comprising a frame, a rotary can feeding member and a rotary can cutting member driven by said motor, means including a worm and worm wheel gear for driving said feeding and cutting members, a driving lug secured to said worm wheel, a driving disc secured to said feeding member, an arm carried by said disc and adapted to be engaged by said lug for positively driving said feeding and cutting members, and a helical spring operatively connected between said motor and said feeding and cutting members whereby said motor revolves a plurality of revolutions prior to driving said feeding and driving members.

2. A motor driven can opener comprising a frame, a shaft journaled on said frame, a can feeding member secured to one end of said shaft, a can cutting member mounted on said frame and driven by said feeding member, a worm wheel gear journaled on the other end of said shaft, a driving disc secured to said shaft, an arm carried by said disc, a worm mounted on said frame and geared to said worm wheel, a driving lug carried by said worm wheel and movable in the path of said arm for positively driving said feeding and cutting members, and a helical spring having one end secured to said shaft and the other end connected to said lug whereby said motor revolves a plurality of revolutions prior to driving said feeding and cutting members.

3. A motor driven can opener comprising a frame, a rotary can feeding member and a rotary can cutting member driven by said motor, and means including a helical spring connected between said motor and said feeding and cutting members whereby said motor revolves a plurality of revolutions prior to driving said feeding and cutting members.

4. A motor driven can opener comprising a frame, a rotary can feeding member and a rotary can cutting member driven by said motor, means including a worm and worm wheel gear for driving said feeding and cutting members, and a helical spring mounted on and having one end connected to said worm wheel and the other end operatively connected to said feeding member for yieldably permitting said motor to attain a driving momentum prior to driving said feeding and cutting members.

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