Dec. 15, 1953 J. M. KARWACKI 2,662,278

POWER-DRIVEN CAN OPENER

Filed April 1, 1952

Fig. 1

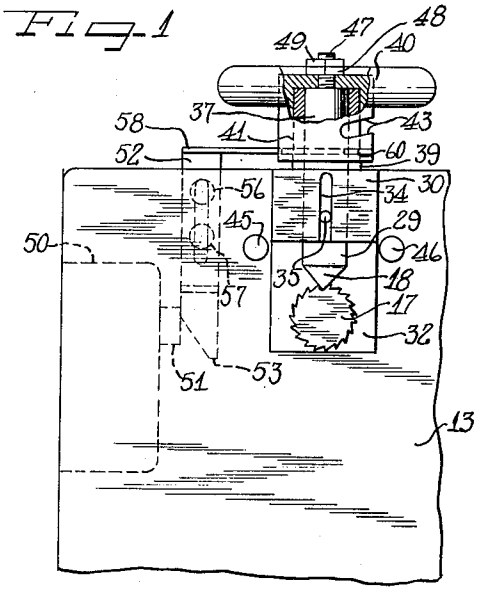


Fig. 2

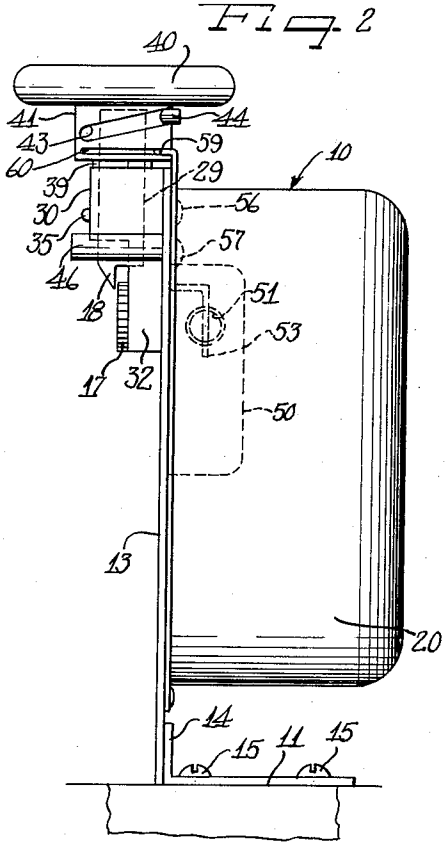


Fig. 3

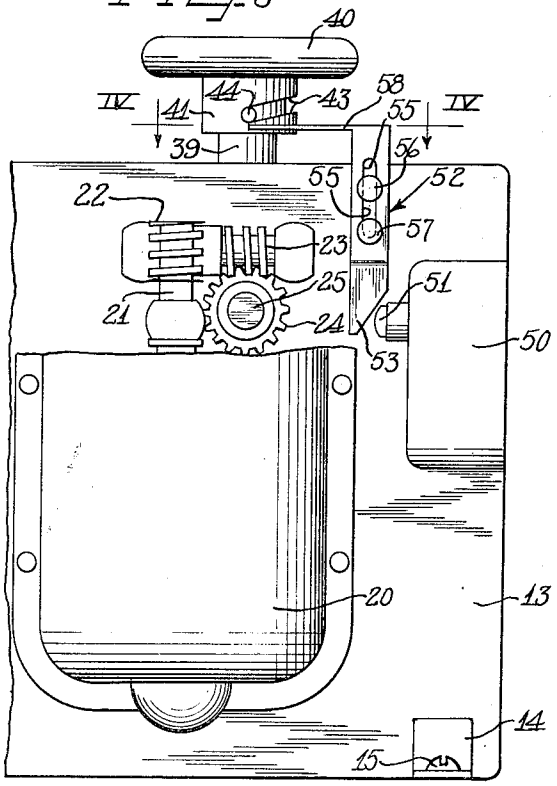
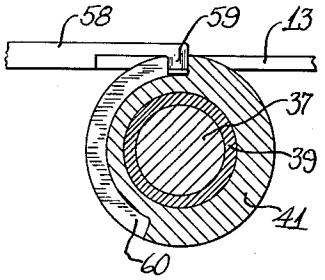


Fig. 4



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Patented Dec. 15, 1953

2,662,278

UNITED STATES PATENT OFFICE

2,662,278

POWER-DRIVEN CAN OPENER

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Application April 1, 1952, Serial No. 279,726

5 Claims. (Cl. 30—4)

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This invention relates to improvements in can opening machines and more particularly to improvements in can opening machines of the power driven type.

It is an important object of the present invention to provide a can opening structure which is particularly rugged and durable and suitable for power driven operation.

It is another object of the present invention to provide a can opener knife operating assembly which is easily operated, and which is particularly convenient and accessible.

It is still another object of the present invention to provide a novel switch actuating assembly for opening and closing a motor operating switch in synchronization with the positioning of the knife blade of the can opening machine.

In accordance with the general object and features of the present invention there is provided in a can opening machine, a knife, a movable carrier for the knife, a mounting for said knife carrier affording reciprocating movement of said carrier toward and away from said rotatable member, a rotatable member for rotating the can, an operating knob for moving said carrier rotatably and reciprocably mounted by said mounting, and cam means between said knob and said mounting for translating rotary movement of said knob into reciprocable movement thereof to drive said carrier toward said rotatable member.

In accordance with other general features and objects of the present invention, there is provided a unitary guide block having a longitudinal channel therethrough and having a tubular boss extending longitudinally from one end of said guide block and having a mounting plate extending from the other end of said guide block, a rotatable member for rotating the can, a shaft carrying the rotatable member extending through said mounting plate, a knife, a carrier for said knife extending within said guide block channel and having an extension telescoping within said boss, and a knob rotatably and reciprocably carried by said boss engaging said extension, and cam means between said knob and said boss for translating rotation of said knob into reciprocation thereof to move said carrier toward and away from said rotatable member.

Other and further important objects, features and advantages of the present invention will be apparent from the disclosures in the specification and accompanying drawings.

On the drawings:

Figure 1 is a fragmentary front elevational view of a can opening mechanism according to the present invention;

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Figure 2 is a side elevational view of the mechanism of Figure 1;

Figure 3 is a fragmentary rear elevational view of the mechanism of Figure 1; and

Figure 4 is a fragmentary horizontal sectional view taken substantially along the line IV—IV of Figure 3.

As shown on the drawings:

In Figure 1, the can opening mechanism 10 according to the present invention is illustrated as being mounted on a flat surface 11 such as the top of a table; however, it is to be understood that this is merely by way of example, and that many other ways may be utilized for mounting the device. For example, a housing may be provided with a suitable base for resting on a flat surface without being secured thereto. In the present instance, however, a backing plate 13 of the device is secured to the surface 11 by means of a right angle bracket 14 which is secured to the backing plate 13 as by means of welding and is secured to the surface by means of screws 15 or the like.

As seen in Figure 2, the mechanism is illustrated as being provided with the conventional toothed rotary driving member 17 for causing the cam to be rotated after it has been pierced by the knife 18. As best seen in Figure 3, this rotary member 17 is driven by means of an electric motor (not shown) which is housed in the casing 20, through a drive shaft 21, worms 22 and 23, worm gear 24, and shaft 25. The brackets 14 are connected to the plate 13 on either side of the motor casing 20, one bracket 14 being shown in Figure 3, for easy access to secure the brackets to a mounting surface such as 11.

As best seen in Figures 1 and 2, the knife blade 18 is mounted on a carrier 29 which is reciprocally mounted in the guide block 30. Integral with the guide block 30 is a mounting plate 32 therebelow which supports the shaft 25 driving the rotatable member 17. Since the guide block and mounting plate are rigidly secured to the back plate 13 as by welding or the like, a very rugged mounting for the rotating member 17 and the blade carrier 29 is provided.

The guide block 30 is provided with a vertical slot 34 which receives a pin 35 carried by the blade carrier 29, so that the carrier is prevented from rotation relative to the guide block during its reciprocating movement.

For controlling the vertical reciprocating movement of the blade 18, the carrier 29 is pro-

vided with a cylindrical extension 37 which telescopes within a tubular boss 39 integral with the guide block 30. As seen in Figure 4, the extension 37 fits snugly within the boss 39 of the guide block so that the blade 18 is guided without any danger of undesirable looseness developing. A rotary handle member or knob 40 has a tubular hub portion 41 telescoping over the boss 39 for sliding movement thereon. The hub portion 41 is provided with a cam slot 43 receiving a pin 44 carried by the boss 39. Thus, as the knob is rotated, the hub portion and knob are moved downwardly toward the rotary member 17. Since the carrier extension 37 is connected to move in an axial direction with the handle 40, downward movement of the handle 40 is effective to drive the blade 18 into the top of a can to be opened. It will be understood that the connection between the carrier extension 37 and handle 40 affords relative rotation thereof since the extension 37 is prevented from rotation by means of the pin 35 and slot 34. The connection is illustrated as comprising a stud 47 threaded at one end centrally into the top of the extension 37 and extending freely through an opening centrally in the handle 40, with a pair of nuts 48, 49 threaded onto the upper end of the stud 47 to hold the handle against axial displacement from the extension 37 but permitting rotation of the handle about the stud 47. For maintaining the can in a proper level position during the opening operation, a pair of posts 45 and 46 are provided on either side of the guide block 30.

For automatically starting and stopping the motor, a motor control switch 50 is provided, Figure 3, having an actuating button 51 which is depressed when the blade 18 has pierced the top of a can, to start the motor, and which is released as the blade is raised away from the can. For actuating the button 51, an operating arm 52 is provided having an offset end portion 53 (Figure 2). The arm is guided for vertical reciprocation by means of a slot 55 therein and a pair of vertically spaced pins 56 and 57. The arm 52 is provided with an extension at its upper end, designated by the reference numeral 58, which as best seen in Figure 4 is provided with a flange 59.

As best seen in Figure 4, the hub portion 41 of the handle 40 is provided with a transverse horizontal groove 60 extending about a portion of the periphery thereof, in which the flange 59 of the arm extension 58 rides. It will thus be apparent that as the handle 40 is moved up and down by means of the pin 44 and cam slot 43, the operating arm 52 is moved up and down by means of the flange 59 engaging in the groove 60 in the handle hub 41. When the knife 18 is in its lowest operating position, the switch button 51 is depressed to close the motor circuit, while in the uppermost position, the switch button 51 is in its normal position, and the driving motor is deenergized.

It will thus be apparent that there is provided according to the present invention a can opening mechanism which is simple in structure, economical in manufacture, durable and compact, and possessed of a minimum number of parts. Further, it will be apparent that the mechanism is easily and quickly operated, the knob 40 requiring a relatively light twisting force by virtue of its camming action. It will further be apparent that the moving parts have elongated guiding surfaces associated therewith so as to avoid undesirable looseness developing therein.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. In a motor-driven can opening machine, a knife, a movable carrier for the knife, a guideway confining said carrier to reciprocal non-rotary sliding movement therein, a cylindrical boss on said guideway, a cylindrical extension on said carrier for telescoping within said boss, a knob engaging said extension and having a hub portion telescoping over said boss and cam means between said hub portion and said boss operative to move said knife relative to said guideway upon rotation of said knob.

2. In combination, in a motor-driven can opening machine, means for rotating the can, a guide block having a cylindrical passage therein and a tubular boss projecting therefrom at one end of said passage, a cylindrical carrier reciprocably mounted in said passage and in said boss, means engaging said carrier and said guide block preventing relative rotation therebetween, a handle having a tubular hub telescoping over said tubular boss for rotation and reciprocation thereon, a knife carried at one end of said carrier, means connecting said handle with the other end of said carrier for reciprocation therewith while affording rotation of said handle relative to said carrier, and cam means between said handle hub portion and said tubular boss for translating rotation of said handle into movement axial of said boss to move said carrier and knife.

3. In combination, in a motor-driven can opening machine, means for rotating the can, a guide block having a cylindrical passage therein and a tubular boss projecting therefrom at one end of said passage, a cylindrical carrier reciprocably mounted in said passage and in said boss, means engaging said carrier and said guide block preventing relative rotation therebetween, a handle having a tubular hub telescoping over said tubular boss for rotation and reciprocation thereon, a knife carried at one end of said carrier, means connecting said handle with the other end of said carrier for reciprocation therewith while affording rotation of said handle relative to said carrier, cam means between said handle hub portion and said tubular boss for translating rotation of said handle into movement axial of said boss to move said carrier and knife, a motor operating switch, an operating arm for operative engagement with said switch, and means mounting said arm for reciprocal movement parallel with said carrier, said handle hub portion having a transverse groove in the periphery thereof, and said arm engaging in said groove for reciprocal movement upon rotation of said handle, to open and close said switch.

4. In a machine for severing the cover portion of a metallic can, a cutter, a movable carrier for the cutter, a rotatable member for rotating the can, a motor for operating the rotatable member, a mounting for said carrier affording reciprocating movement of said carrier toward and away from said rotatable member, a handle for engaging said carrier and rotatably and reciprocally mounted by said mounting, cam means between said handle and said mounting for translating rotary movement of said handle into reciprocal movement thereof to drive said cutter toward

said rotatable member, a motor operating switch, an operating arm for operative engagement with said switch, and means mounting said arm for reciprocal movement parallel with said carrier, said handle hub portion having a transverse groove in the periphery thereof, and said arm engaging in said groove for reciprocal movement by rotation of said handle to open and close said switch.

5. In a can opening machine, a mounting, a guide block carried by said mounting having a channel extending therein and having a tubular boss connected at one end with said guide block, a mounting plate extending from the other end of said guide block, a rotary member, a shaft carrying said rotary member extending through said mounting plate, a cutter blade for cooperation with said rotary member, a carrier connected to

said blade reciprocably mounted in said guide block channel and having a cylindrical extension slidingly carried within said tubular boss, a rotary handle engaging said extension and having a tubular hub telescoping over said boss, and cam means between said hub and said boss for translating rotary movement of said handle into reciprocating movement thereof toward and away from said rotary member.

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