Sept. 9, 1952 D. M. WILSON 2,609,599

CAN OPENER

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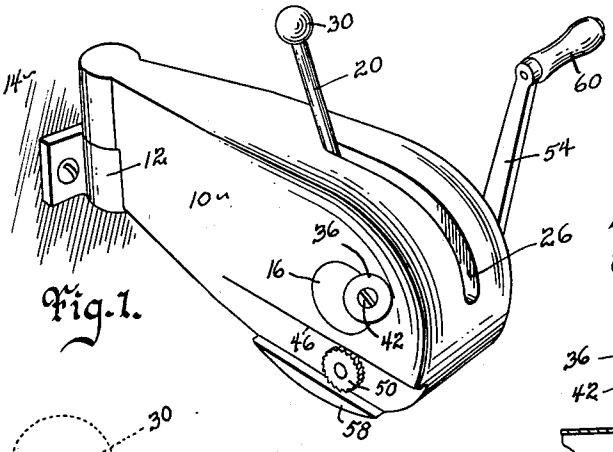


Fig. 1.

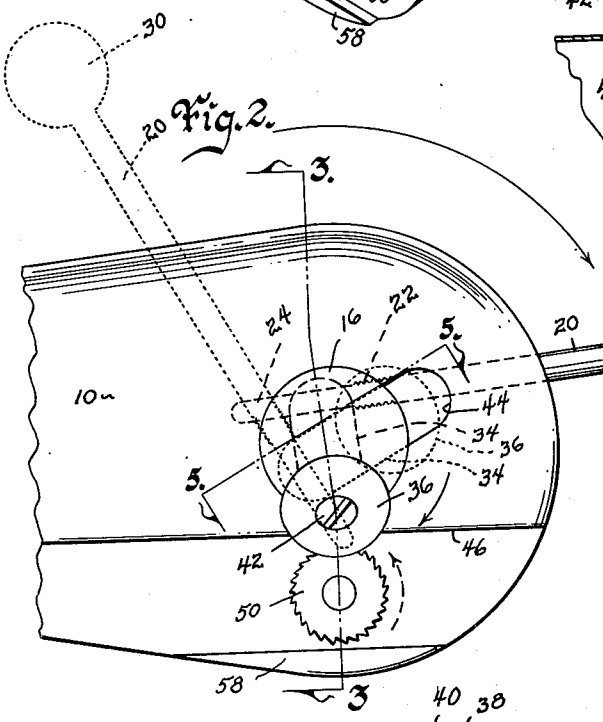


Fig. 2.

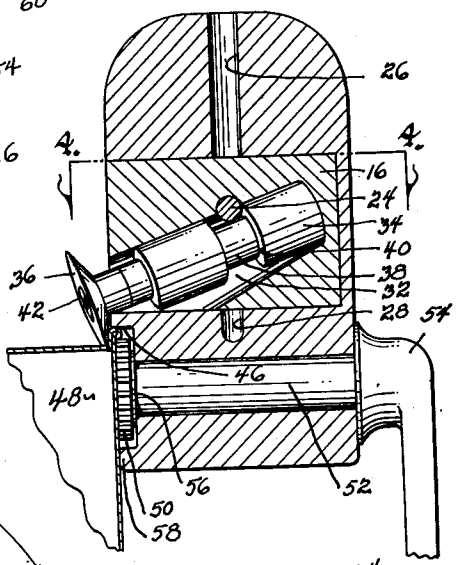


Fig. 3.

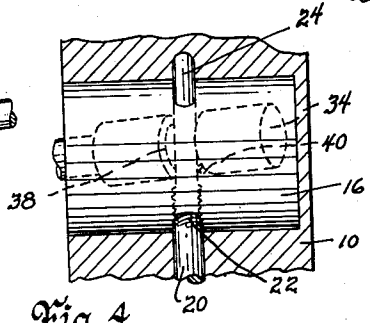


Fig. 4.

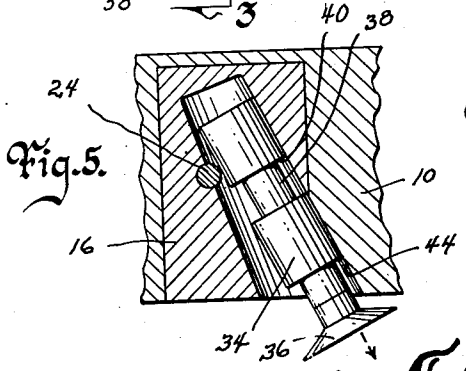


Fig. 5.

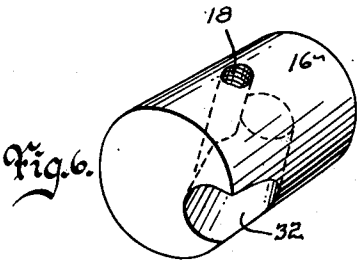


Fig. 6.

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CAN OPENER

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5 Claims. (Cl. 30—9)

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My invention relates to the art of opening food storage cans. Specifically I have invented an improved can opener that is readily maintained in a sanitary condition without risk of damaging the working parts of the can opener and which also reduces by one-half the motions necessary to punch and mount the can in the conventional opener.

Ever since the so-called "tin" can was invented our civilization has been prolific in producing devices for opening the cans in order to extract the contents. While the known openers cover a very broad range of types and styles of devices, my discussion here is limited to openers of the type that mount on a wall or other vertical surface or are supported by some means other than the hands of the operator. This general type of opener generally employs a circular rotating cutting blade and a toothed gear working in cooperation. One or the other of these members is vertically movable with respect to the other and is provided with leverage sufficient to force the cutter into the can to puncture the can lid and at the same time clamp the can to the opener so that rotation of the toothed driving gear rotates the can. As the can rotates of course the cutting wheel severs the portion of the can lid that is inside the rim from the balance of the can. In so doing, of course, the interior of the can is exposed to the atmosphere so that the food stored in it is removed readily. By reversing the action that clamps the can in the conventional opener, the cutter and driving gear are separated to permit the removal of the can from the opener to a convenient place for removing the contents of the can.

Many improvements and clever mechanical movements have been devised for the basic opener described above but at least two major problems remain unsolved by openers within my knowledge. One of these is the problem of keeping the cutting blade of the opener clean and sanitary. The other problem is not as serious as the unsanitary cutter and this second problem is the "lost motion" involved in using the majority of conventional devices that employ a separate lever for punching and clamping the can. In every can opener known to me and which employs a separate lever for clamping the can, it is necessary to make four motions to clamp, punch and release the can. The punching clamping lever is usually pivoted near the forward end of the device and the opener is in its most compact condition when this lever is folded back along the top of the device. When the lever is placed in

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this position, however, the cutter and driving gear are in the clamped or can opening position. Before a can is placed in the device, therefore, it is necessary to draw the lever forward to separate the gear and the cutter so that the can rim can be inserted between them. The lever is then moved to the position from which it was just taken in order to punch the can and clamp it in the opener. The driving gear is then rotated until the can top is cut as much as desired, at which time the lever is again swung to a forward position to release the can. After the can is removed, it is only natural to place the lever back in its retracted position again in order to get it out of the way. Obviously four movements are involved in the use of the conventional can opener exclusive of the motion necessary to turn the driving gear. I know of at least one exception to this four motion can clamping and releasing type of opener which is an opener that clamps the can automatically as the driving gear begins to be rotated and releases the can by reverse action of the opener driving gear crank. As this opener has no separate lever for clamping the can, however, it falls within the exception set out at the beginning of this discussion. It is not comparable to the separate clamping lever opener, since it employs a relatively complex mechanism and one that is much more expensive than the separate clamping lever openers.

There is one failing or shortcoming, however, found in all mounted can openers of which I have any knowledge. Without exception the cutting tool in mounted can openers is secured to the device in a manner that makes removal of the cutter for regular cleaning highly impractical if not impossible. The housewife is faced with a dilemma. Either she must permit the opener cutter to accommodate food particles as cans are opened or she must wash the entire can opener. Practically all mounted openers are provided with a mounting which makes removal of the entire opener to permit washing the cutter blade easy. Without exception also, however, these units require at least a minimum of lubrication. If the unit is not washed, the original lubrication is sufficient for long service. On the other hand, if the unit is washed regularly it should also be relubricated at frequent intervals. As most housewives fail to oil or grease the mechanism at all, it usually follows that the working parts of the frequently washed openers are often rusted or even "frozen" so that normal movement is impossible.

If the non-washing habit pattern is established

and followed, the cutter is soon coated with a mass of dried and hardened food matter that in some instances has caused the cutter to be stuck so that normal rotation as it cuts is impeded and in one case prevented entirely. This last mentioned case is a type that is particularly unfortunate, because the opener creates and deposits in the can an unusually large amount of can cuttings commonly known in the art as iron filings. If the opener would fail to operate altogether, there would be less real objection to having the rotating cutter become stuck or "frozen." Allowing the cutter to accumulate a deposit of food on it has another and much more serious disadvantage than the deteriorating effect on the mechanical action. When non-acid foods are allowed to accumulate, the possibilities for the growth of bacteria at room temperatures are great. Even when an acid food has limited the bacteria potential on the cutter, the appearance of the cutter encrusted with dried food matter is esthetically unattractive. Also many people prefer not to open dog and cat food cans with the same opener they use for cans the contents of which are for human consumption unless the cutter is washed after use on the former and before use on the latter. The difficulty of washing the conventional opener has caused many people to provide themselves with two openers which is an economic waste.

In view of the foregoing, therefore, it is the principal object of my invention to provide a can opener that can be maintained in a sanitary unclogged condition.

A still further object of this invention is to provide a can opener that can be maintained in a sanitary condition without danger of interfering with lubricant on the major working parts.

A still further object of this invention is to provide a can opener that reduces the motions necessary to punch and clamp the can in the opener.

These and other objects will be apparent to those skilled in the art.

My invention consists in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, and specifically pointed out in my claims, and illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of my can opener with the clamping lever in the open position.

Fig. 2 is an enlarged side elevation view of the working parts of my can opener. A portion of the device is deleted to conserve space while dotted lines shown the position of the clamping and punching lever and cutter in the open position. Broken lines show hidden parts.

Fig. 3 is an enlarged cross sectional view of my can opener taken on the line 3—3 of Fig. 2. A portion of the device is deleted to conserve space and a portion of a can is included to show the relation of the parts of the can to the opener as the can is being opened.

Fig. 4 is an enlarged fragmentary longitudinal sectional view of my can opener taken on the line 4—4 of Fig. 3. Broken lines show hidden parts.

Fig. 5 is an enlarged sectional fragmentary view of my opener taken on the line 5—5 of Fig. 2 to show how the cutter cylinder is removed or inserted.

Fig. 6 is an enlarged perspective view of the arbor cylinder with broken lines used to show hidden passageways in the cylinder.

Referring to the drawings I have used the numeral 10 to designate the main frame or body portion of my opener which is mounted in any convenient manner as by the bracket 12 on vertical surface 14. The base or body 10 carries a cylindrical arbor element 16 in a well that extends transversely of the body length. A drilled passage 18 that is threaded at one end and reduced in size at the other extends transversely through the arbor. A punching and clamping lever 20 has threads 22 on it that fit the threads of the arbor cylinder. The end 24 of the lever 20 that lies beyond the threads 22 is reduced in size to fit the lower end of bore 18. A vertically extending longitudinal slot 26 that connects with the arbor receiving bore permits access of the lever 20 to the cylinder. Lever end 24 extends beyond the cylinder 16 and enters an appropriate groove 28 cut in base 10 as shown in Fig. 3. The lever may be provided with a knob such as the one designated 30 to facilitate grasping it.

A well 32 is provided in the arbor cylinder to receive the cutter support cylinder 34. This well 32 is in the form of a truncated cone and extends into the arbor cylinder at a compound angle with reference to the axis of the arbor cylinder and intersects a portion of bore 18. The angles of bore 32 are such that with the cylinder 34 in the bore 32 and handle 20 in the position shown in Fig. 2 with solid lines, cutter blade 36 is tipped down and slightly sideways. As shown in Fig. 2 the right cutter blade edge is slightly nearer to body 10 than is the left one. The cutter cylinder has an annular groove 38 extending around it which permits the cylinder to be held in place by having the rear or inside shoulder 40 of groove 38 engage the portion 24 of lever 20, as shown in Fig. 3. Cutter blade 36 is rotatably secured to the cylinder 34 by any suitable means such as the screw 42 or the like. As shown in Fig. 5 a portion of the base is milled away at 44 to complement the truncated cone shaped bore 32 when the clamping and punching lever is in the position shown in Fig. 1.

A can top engaging ledge 46 is provided to hold a can 48 level as the top is being taken out of the can. The ledge and its function are illustrated in Figs. 2 and 3. A can driving gear 50 is rigidly secured to the shaft 52 which in turn is rotated by crank 54. A washer 56 spaces the driving gear from the body portion 10. Below the gear is the buffer or ridge 58 that prevents the lower portion of the can from moving toward the space below the opener and causes the can to maintain the vertical attitude disclosed in Fig. 3. Crank 54 is provided with any suitable form of handle such as the one designated 60 to facilitate operating crank 54.

As is clear from the showing in Fig. 5, the cutter and its support can be withdrawn whenever the lever 20 is in the position shown in Fig. 1 because well 32 aligns with the removal and insertion notch 44. The cutter blade and its supporting cylinder are easily removed when the device is so positioned and this fact invites washing the cutter as frequently as the housewife should be so inclined. Consequently, the cutter will not be allowed to accumulate a mass of food material. Also it is not necessary to have separate openers for pet foods and foods for human consumption. Also, of course, it is a very easy matter to lubricate the cutter cylinder and cutter when it is re-

moved. The only points requiring lubrication are exposed and readily available for oiling. Furthermore, if the cutter is not relubricated after washing, it is the only part damaged by the failure to lubricate. Furthermore since the cutter and its supporting cylinder are easily removed, little expense and effort are required to replace the cutter if it is dulled or fails to rotate properly because of improper maintenance. Fig. 1 discloses that the clamping lever is in its normal storing position which is back and out of the way when the opener is open for removal and insertion of cans. Consequently no preliminary motion is necessary before a can is inserted in the opener and the clamping lever pulled forward to punch the lid and secure the can in the opener. Likewise when the lid of the can has been severed and the lever is moved rearwardly to the position shown in Fig. 1 so that the can is freed from the opener, the lever **20** then occupies the position which places it in the position least apt to be in the way. Instead of the usual four movements for the punching and clamping lever, therefore, my opener requires only two to complete a can opening cycle. It is clear that I have invented a can opening machine which accomplishes the objects of my invention.

Some changes may be made in the construction and arrangement of my can opener without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. In a can opener, a body portion; said body portion having a transverse well therein, an arbor cylinder rotatably mounted in the well of said body portion, means for limiting the rotation of said arbor cylinder; said arbor cylinder having an eccentrically positioned well therein, a cylinder fitting within said arbor well, a cutter blade secured to said cylinder, a lever secured to said arbor cylinder for rotating it within its limits; means for holding said cylinder in said arbor well when said arbor is at one limit of its rotation, means for freeing said cylinder from said arbor well when said arbor is at the other limit of its rotation, a driving gear rotatably mounted on said body below said arbor cylinder, and a means for rotating said driving gear.

2. In a can opener, a body portion, a driving gear rotatably mounted on said body portion, a means for rotating said driving gear, an arbor movably mounted on said body member, a cutter operatively associated with said arbor, means for moving said arbor selectively to carry said cutter to a point near said driving gear and away from said driving gear, and means associated with said arbor for selectively securing said cutter to said arbor when said cutter is near said driving gear and freeing said cutter from said arbor when said cutter is moved away from said driving gear.

3. In a can opener, a body portion, a driving gear rotatably mounted on said body portion, a means for rotating said driving gear, an arbor movably mounted on said body member, a cutter operatively associated with said arbor, a lever secured to said arbor for moving it to carry said cutter to a point near said driving gear and away from said driving gear selectively; said lever being in a forward position when said cutter is near said driving gear and in a rearward position when said cutter is moved away from said driving gear, and means associated with said arbor for selectively securing said cutter to said arbor when said cutter is near said driving gear and freeing said cutter from said arbor when said cutter is moved away from said driving gear.

4. In a can opener, a body portion; said body portion having a transverse well therein, an arbor cylinder rotatably mounted in the well of said body portion, means for limiting the rotation of said arbor cylinder; said arbor cylinder having an angled well therein, the top of said arbor cylinder well arranged at one side of one end of said arbor cylinder, a supporting cylinder selectively slidably placeable in and removable from said arbor cylinder well, a cutter blade secured to said supporting cylinder, means for locking said supporting cylinder in said arbor cylinder well when said arbor cylinder is at one limit of its rotation, a driving gear rotatably mounted in said body portion in spaced relation to said arbor cylinder, means for imparting rotary motion to said driving gear, and means for rotating said arbor cylinder within limits.

5. In a can opener, a body having a transverse well therein; said body also having a slot extending longitudinally from the front center of said body portion to substantially the top center of said body and communicating with said body transverse well, an arbor cylinder rotatably mounted in said body transverse well; said arbor cylinder having a truncated cone shaped well in it extending from a corner of said arbor cylinder for a substantial portion of its length and at a compound angle with respect to the longitudinal axis of said arbor cylinder, a lever extending into said body slot and into said cylinder and secured therein; said lever having a portion of it extending into said arbor cylinder well; said body having a portion of its bulk forming the rim and side of said body well cut away to complement the angled well in said arbor cylinder when said lever is at the end of said body slot that is near the top center of said body, a cylinder having an annular groove therein, a cutter secured to said cylinder; said cylinder being slidably insertable and residing in said arbor cylinder well when it is aligned with the cut away portion of said body; the groove of said cylinder engaging said lever; whereby when said lever is moved to the other end of said slot said cylinder is locked in said arbor cylinder, a driving gear rotatably secured to said body spaced from said arbor cylinder, and means for rotating said driving gear.

DONALD M. WILSON.

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The following references are of record in the file of this patent:

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