May 16, 1939. S. BLOOMFIELD 2,158,319

CAN OPENER

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Fig. 1.

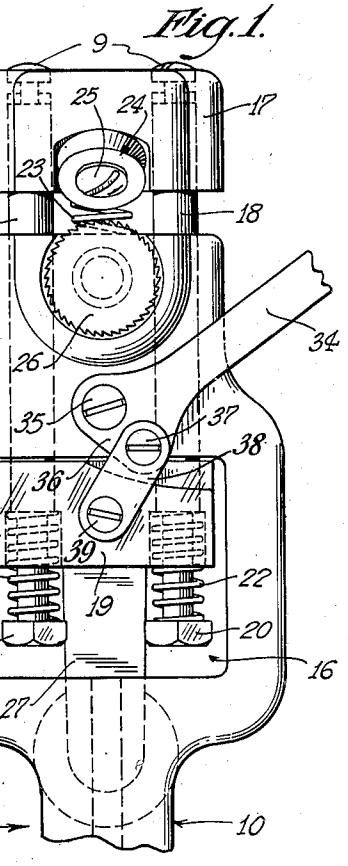



Fig. 2.

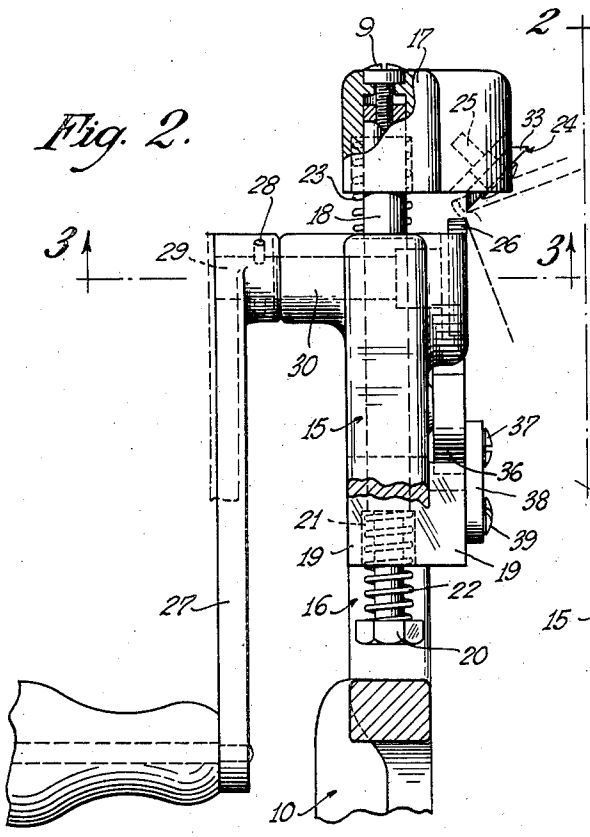
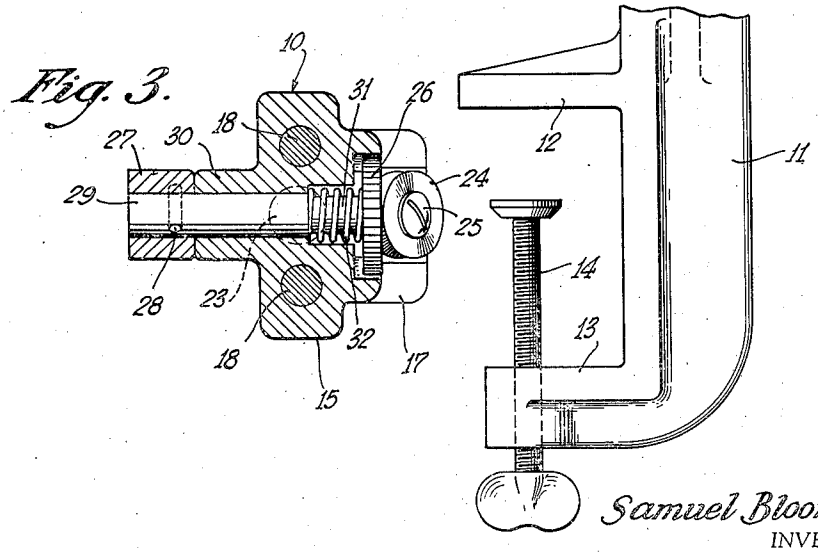



Fig. 3.




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# UNITED STATES PATENT OFFICE

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## CAN OPENER

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8 Claims. (Cl. 30—9)

The present invention pertains broadly to cutting devices, and more particularly to an implement for opening cans and the like, and includes among its important objects the provision of a frame member or standard including bracket means for attachment of the same to an object, a rotatable driving wheel and manual means for rotating the same, a reciprocable cutting head and cutting member thereon, movable toward and away from the driving wheel, and lever means for moving the driving head and the cutting member down toward the driving wheel and locking the head in such position.

Viewed from another aspect, the invention contemplates the provision of a simplified can opening implement of greatly increased cutting power but provided with a minimum number of working parts arranged to simplify construction and reduce the cost of production, while at the same time assuring an effective and durable implement.

Another object is the provision of a manually operable self-locking toggle mechanism for moving the cutting tool into operative position.

A further object resides in the provision of a can opener including a mounting frame with a vertically reciprocable cutting head and an angularly disposed cutting wheel thereon with spring means normally urging the cutting head away from the rest of the frame, and a manually operable toggle means on the frame arranged to move the cutting head structure to urge the latter and the cutting wheel thereon back toward the frame and a serrated driving wheel on the latter, the toggle means being disposed to automatically lock the head in lowered or cutting position as a result of an over-center arrangement.

Another object is the provision of a resilient mounting for the driving wheel whereby the latter may adjust itself to various thicknesses of cam rim automatically when the can is moved into cutting position.

Still another object is the provision of a movable cutting head and spring means arranged to permit the head to yield when the toggle lever is operated in the event that too large a can is inserted between the cutting and drive wheels, or in the event that some other cause prevents normal lowering of the cutting head.

In addition to the foregoing specifically reiterated objects, the invention includes other novel features, all of which will become apparent as the following description proceeds in view of the drawing, in which:

Fig. 1 is a front elevation of the cutting unit;

Fig. 2 is a fragmentary side elevation taken in the direction of line 2—2 of Fig. 1; while

Fig. 3 is a horizontal section taken along line 3—3 of Fig. 2.

The improved can opener of the present invention is of the type in which the rim portion of the can is gripped between a cutting wheel and a driving wheel so that the can is rotated and the end thereof severed from the main body. A preferred form of the invention is illustrated in Fig. 1 and includes an upright frame casting or support 10 having a lower arm 11 provided with attaching bracket arms 12 and 13, the arms 13 having a thumb screw 14 whereby the support may be attached to a table or the like.

Near its upper end the support 10 is provided with a frame-like part 15 providing an opening 16 especially adapted to accommodate certain yieldable locking mechanism hereinafter to be described.

Mounted at the upper end of the support is a cutting head 17 having attached thereto by bolts 9 a pair of spaced legs 18 slidable in sleeve portions in the casting and extending into the opening 16 and into a yieldable driving block 19 which is itself slidable on the rods or legs 18 and which constitutes a yieldable connecting means between the cutting head and certain operating mechanism, the block 19 hereinafter being referred to as the "toggle block" for purposes of convenience.

The block 19 is yieldingly retained on the legs 18 by means of bolts 20 threaded into the lower ends of each of the legs 18 through enlarged seat portions 21 in the block, each leg being embraced by a relatively strong coil spring 22 bearing at its outer end against the head of the bolt 20 and at its inner end against the bottom of the seat portion 21 in the toggle block. It will be apparent that the block 19 may be urged downwardly against the tension of the several springs 22 independently of any movement of the cutting head 17 or its legs 18—provided that the head portion 17 is in some manner held immovable. This is one of the important features of the invention and as will become more apparent hereinafter.

The coil spring 23 is disposed between the cutting head 17 and the rest of the frame 10 so as normally to urge the head outwardly of the support or frame for the purpose of spacing a cutting wheel 24 pivotally mounted at an angle on the cutting head by means 25, away from a serrated driving or feeding wheel 26 pivotally

mounted on the main support adjacent the upper edge of the latter.

The feeding wheel 26 (Figs. 2 and 3) is adapted to be rotated by a handle 27 connected by pin means 28 to the outer end of a shaft 29 extending through a boss 30 into the support or frame 10, the feeding wheel 26 having a shaft portion 31 surrounded by an expansion spring 32 for the purpose of permitting the feed wheel 26 and shaft to shift axially.

As seen in Fig. 2 particularly, the cutting wheel 24 has a beveled cutting edge 33, and the pivotal axis or mounting 25 thereof is disposed at an angle to the axis of rotation of the feed wheel 26, so that the cutting edge of the beveled cutting wheel is disposed substantially above the outer peripheral edge of the feeding wheel 26 when the latter is in its normal position as seen in Fig. 2, the return spring 23 normally disposing the cutting head 17 upwardly so that the cutting wheel 24 is appreciably spaced from the periphery of the feeding wheel 26, thus permitting the insertion between the wheels of the rim portion of a can. It may be observed that one of the important purposes of the axially shifting feature of the feeding wheel 26 is the fact that cans having rim portions of varying thicknesses or width may readily be wedged in between the cutting wheel 24 and the feeding wheel 26, the latter shifting inwardly against the tension of its normal spring 32 without, however, any tendency to recede when the cutting wheel is driven downwardly into cutting engagement with the can. The normal distance between the confronting edge portions of the cutting wheel 24 and the feeding wheel 26 will accommodate the ordinary can rim.

In order to drive the cutting head and its cutting wheel down into operative engagement with the can there is provided means in the form of a lever 34 (Fig. 1) pivotally mounted as at 35 on the support below the feed wheel 26 and adjacent the opening 16, and further having an offset lever extension 36 to which is pivotally connected one end 37 of a toggle lever 38, the toggle lever in turn being pivotally connected as at 39 to the toggle block 19.

The disposition of the lever members 34—36—38 is such that the latter constitute an over-center toggle system, effective when the lever 34 is moved downwardly (clockwise) to pivot the toggle lever 38 to the left (anticlockwise) so as to move the pivotal connection 37 into alignment with the connections 35 and 39 and a center line constituted by a common radius therebetween. This motion of the main locking lever 34 tends to lower the toggle block 19, which motion is transmitted to the head 17.

Continued downward movement of the main lever 34 moves the toggle connection 37 past the aforesaid center line and, hence, "over-center", so as to lock the block 19 in lowered position. Since a very great leverage is exerted by this toggle mechanism, the yieldability of the connection between the block 19 and head 17 is peculiarly advantageous to the over-center locking operation of this cutter locking means.

Thus, in the operation of the device the rim portion of a can may be inserted in the space between the cutting edge of the cutting wheel 24 and the feeding wheel 26 as illustrated in dotted lines in Fig. 2, and thereafter the lever means 34 may be grasped and turned in a clockwise direction (Fig. 1) so as to urge the block 19 downwardly, the latter movement communicating through the relatively stiff spring 22 to the bolts 20 and hence urging the spaced legs 18 and the cutting head 17 downwardly. The cutting edge of the wheel 24 will thus be forced into the metal of the can, the lever means 24 being depressed a distance adequate to move the toggle system over-center so as to lock the block 19 in depressed condition. Thereafter the handle 27 may be rotated so as to cause the serrations on the feed wheel 26 to grip the rim portion of the can and rotate the can between the feed wheel and the cutting wheel until the rim portion of the can is entirely cut or severed from the main body thereof, whereupon the lever means 34 may be moved a short distance in an opposite or anticlockwise direction past dead-center and the spring means 23 will quickly restore the head 17 into its normal position, as viewed in Fig. 1, thus releasing the severed can top from between the wheels 24 and 26.

In the event that the cutting wheel 24 cannot be urged into the metal of the can or other article disposed between the wheels 24 and 26, or in the event that some impenetrable body is improperly disposed between these wheels, rupture of the mechanism will be prevented, even though the lever means 34 be forced downwardly to draw the wheels together, because of the special yieldable connection 18—19—20—22 by means of which the toggle block 19 may be urged against the tension of the springs 22 without any relative movement of the wheels 24 and 26.

The appended claims are not intended to be limited to the specific structure herein described, but include all variations, modifications and rearrangements which may be made in the device specifically described herein for purposes of illustration, and fairly coming within the spirit of the invention.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A can opener including a support, a feeding wheel and means for rotating the same mounted on said support, said feeding wheel being movable axially and provided with yieldable means normally urging the same into a predetermined axial position, a cutting head slidably mounted on said support, yieldable means normally urging said head into spaced relation with said support relative to said feeding wheel, a cutting wheel mounted on said cutting head with its pivotal axis disposed at an angle to the axis of said feeding wheel, said cutting wheel having a cutting edge normally disposed at a distance from said cutting wheel adequate to receive the rim portion of a can in the space therebetween, said feeding wheel being shiftable axially to accommodate the can rims of varying size, and mechanism mounted on said support for moving said cutting head and cutting wheel thereof into cutting engagement with a can rim disposed between the cutting wheel and feeding wheel as aforesaid.

2. A can opener in accordance with claim 1 further characterized in that said mechanism for moving the cutting head and cutting wheel into operative relation relative to said feeding wheel is further provided with over-center means cooperable therewith for locking said mechanism to hold said head and cutting wheel in operative relation to the feeding wheel as set forth.

3. A device of the class described including a support having an open portion between its ends,

a cutting head slidably mounted on said support and having leg means extending into said open portion of the support, a toggle block slidably embracing said leg means in the open portion of the support, overload spring means operatively associating said toggle block with said leg means whereby the movement of the toggle block in a particular direction will effect movement of the cutting head in said direction, spring means normally urging said cutting head oppositely to said particular direction, a feeding wheel and drive means therefor mounted on said support adjacent said cutting head, the latter being provided with a cutting element movable toward and away from cutting relation with said feeding wheel by movement of said cutting head in opposite directions, together with self-locking manually actuated lever means mounted on said support and having operative engagement with said toggle block for movement of the latter in said particular direction for the purpose aforesaid.

4. A can opener in accordance with claim 3 further characterized by the provision of an axially sliding mounting for said feeding wheel and yieldable means normally urging the feeding wheel toward said cutting element, the feeding wheel being shiftable axially in an opposite direction to permit the insertion of can rims of various sizes between said cutting element and the wheel when the cutting head is in normal position.

5. A can opener including a support, a cutting head mounted on spaced legs slidably mounted on said support, feeding means mounted on the support near said head and the latter having a cutting wheel disposed for cooperation with said feeding means to engage therebetween the rim portion of a can or the like, a yieldable connecting member slidably mounted on said spaced legs, spring means engaged by said connecting member for moving said legs to move said cutting head when said connecting member is moved in a particular direction, spring means normally urging said cutting head to space said cutting wheel at a distance from said feeding means so that a can rim may be inserted therebetween, and an over-center lever mechanism for moving said connecting member back and forth to move said cutting head correspondingly and effect movement of said cutting wheel toward and away from the feeding means.

6. A can opener as defined in claim 5 and wherein said feeding means is arranged for yielding movement relative to said cutting wheel whereby can rims of greater than a determined size may be engaged between said feeding means and cutting wheel.

7. In a device of the class described, a support, a cutting head and leg means slidably mounting the same for reciprocation on said support toward and away from a feeding wheel also mounted on said support, a cutting wheel on said cutting head movable into and out of operating position by the latter relative to said feeding wheel, means for rotating said feeding wheel, a toggle block slidably mounted on said leg means, spring means operatively interposed between said toggle block and said leg means and resisting sliding movement of the former relative to the latter, a hand lever pivotally mounted on said support, a toggle lever having pivotal connection with said hand lever and said toggle block and movable past dead-center position in a particular direction when said hand lever is moved a predetermined distance in said direction to effect movement of said toggle block and move said cutting head to position said cutting wheel in operative relation to the feeding wheel.

8. A can opener including a support, a feeding wheel and driving means therefor mounted on said support, a cutting head mounted on said support for reciprocation and provided with a cutting wheel movable therewith into and out of cutting relation with said feeding wheel, a toggle block arranged for movement relative to said cutting head in the direction of reciprocation thereof, means yieldingly interconnecting the toggle block and cutting head, lever means on said support and arranged to move said toggle block and effect movement of said cutting head to position the cutting wheel thereof in cutting relation with said feeding wheel, said yielding interconnecting means associated with the toggle block and the cutting head permitting operation of said lever means when said cutting head is restrained against movement, whereby injury to the mechanism may be prevented, said feeding wheel being arranged for axial displacement from an initial position relative to said cutting wheel whereby can rims of varying sizes may be accommodated between said wheels, said feeding wheel having spring means normally urging the same into a predetermined normal axial position relative to said cutting wheel.

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