July 3, 1928. 1,676,135

F. A. CUYLER

CAN OPENER

Filed June 26, 1925

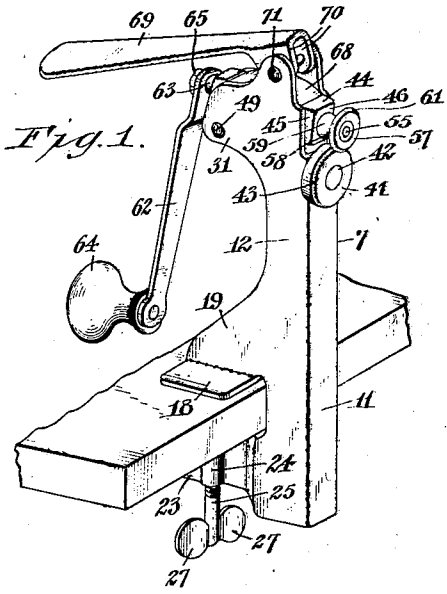


Fig. 1.

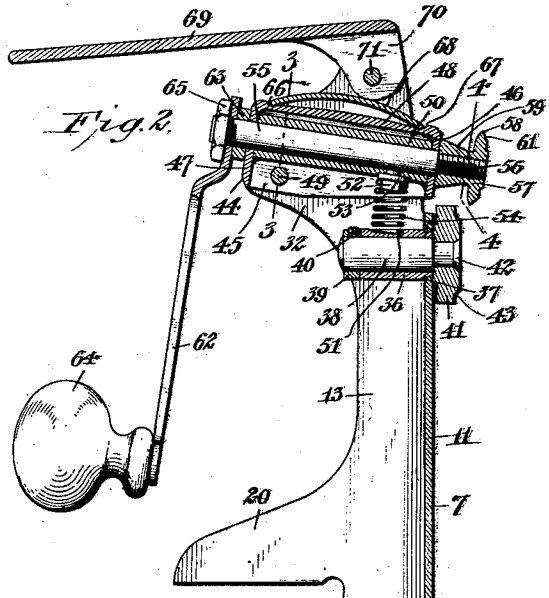


Fig. 2.

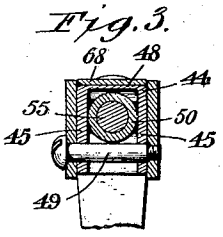


Fig. 3.

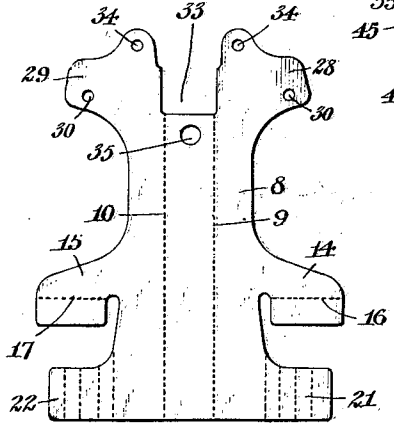
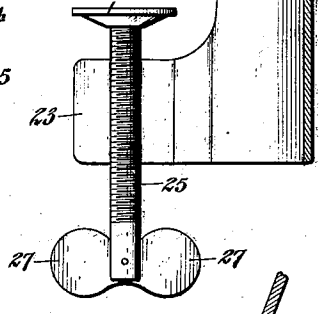


Fig. 6.



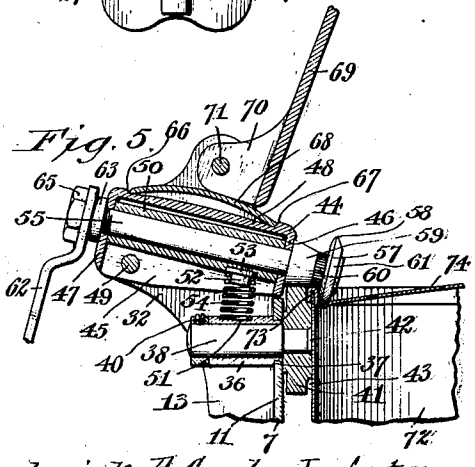


Fig. 5.

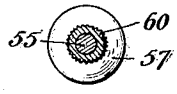


Fig. 4.

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UNITED STATES PATENT OFFICE.

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CAN OPENER.

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This invention relates to can openers, and one of the objects of the same is to provide a can opener which is simple in construction, comparatively inexpensive, substantial, and easily operated.

Another object is to provide a can opener adapted to be secured to an object in a rigid manner so that cans to be opened can be easily applied to the opener, and upon operation of the latter cause the head of a can to be completely severed from the remainder of the can and at the same time prevent the severed portion swinging down into the can and coming in contact with the contents thereof.

A further object of my invention is to provide a can opener with means for clamping the can in the position in which it is to be maintained when removing one of the walls thereof, said opener being provided with cutting or slitting mechanism tending, under operation, to force the wall of the can being removed outwardly so that it can be conveniently taken hold of, and when completely severed from the remainder of the can, be removed without liability of its falling into the can and coming in contact with the contents thereof.

Further objects of my invention are to provide a can opener with rotatable elements co-operating to sever a wall of a can from the remainder of the can and simultaneously therewith force the wall when partly severed from the can outwardly so that it can be taken hold of and be completely severed without liability of dropping into the can.

Still further objects of my invention are to provide a can opener with rotatable elements co-operating to sever a wall of a can and which is also provided with means for positively forcing one of said rotatable elements through the wall to be severed and with means for permitting said rotatable element to yield in passing over a seamed portion of the can.

A further object of my invention is to provide a can opener with a frame or body portion stamped from a single piece of metal having supporting portions enabling the body portion when formed to rest upon a table or other rigid support and having bearing openings stamped therein for pivoted parts carried by said body portion.

With the above and other objects in view, the invention consists in the novel features of construction and in the arrangement and combination of parts to be hereinafter described and more particularly pointed out in the subjoined claims.

In the drawings:—

Fig. 1 is a perspective view of my improved can opener showing the same applied to a table top or other suitable support.

Fig. 2 is a central vertical section taken through the axis of the rotatable elements serving as the cutting or slitting mechanism.

Fig. 3 is a transverse section taken on line 3—3, Fig. 2, looking in the direction of the arrow crossing said line.

Fig. 4 is a transverse section taken on line 4—4, Fig. 2.

Fig. 5 is a view of the upper portion of the can opener, similar to the section shown in Fig. 2, but showing the parts thereof in can-retaining and slitting or cutting position.

Fig. 6 is a plan view of the blank from which the body portion of the device is constructed.

The reference numeral 7 designates the frame or body portion of the device, which is formed of the blank 8, shown in Fig. 6. The blank is bent along parallel lines 9 and and 10 so that the frame or body portion is provided with a front wall 11, formed of that portion of the blank between the parallel lines 9 and 10, shown in Fig. 6, and side walls 12, 13 formed, respectively, of the portions of the blank outside of the fold lines 9 and 10. The blank is further provided with wings 14, 15, which are bent along the lines 16, 17 to form supporting ears 18 extending laterally from the inward extensions 19, 20 on the side walls 12, 13, respectively, said extensions being the wings 14, 15 of the blank 8. The blank 8 also has two wings 21, 22 at its lower end which are brought in contact with each other to form the arm 23 adapted to be placed underneath said table or support when the supporting ears 18 rest upon said table or support; parts of said wings 21, 22 being concaved on their inner sides to provide the vertical extensions 24 at opposite sides of the arm 23, one of which is shown in Fig. 1 of the drawing, there being a similar extension on the other side of said arm. In this manner a cylindrical opening is formed through the arm, which opening is tapped in any suitable manner and has threaded

therethrough a clamping screw 25 having a swiveled inner end 26 adapted to be brought against the under side of the table or support, and wings 27, or other suitable means, to be grasped by the hand for conveniently rotating said clamping screw.

At its upper end the blank 8, from which the frame or body portion 7 is formed, has wings 28, 29, provided with a pair of transversely-alined openings 30, and when this blank is formed into the frame or body portion, as shown in Fig. 1, said wings 28, 29 form inward extensions 31, 32, of the side walls 12, 13, respectively. The blank 8 is also notched at its upper end, as at 33, and at the upper extremity of the blank at opposite sides of this notched portion, a pair of transversely-alined openings 34 is formed.

Beneath the notch 32 of the blank, a circular opening 35 is formed in the area between the fold lines 9 and 10, and in this opening, after forming the blank into the frame or body portion, is mounted one end of a bearing sleeve 36, said sleeve being reduced, as clearly shown in Fig. 2, to provide a shoulder 37 adapted to bear against the inner side of the front wall 11, the reduced portion of said sleeve being headed within the opening so as to firmly secure this bearing sleeve to said wall. By the use of this bearing sleeve, an extended bearing is provided for a shouldered shaft 38, the shoulder of which is flush with the reduced end of the bearing sleeve so that the reduced portion of this shaft extends outward beyond the front surface of the front wall. This shaft 38 also extends inwardly beyond the inner end of said bearing sleeve and has a stop collar 39 secured thereto by means of a set screw 40, or otherwise.

To the reduced front end of the shaft 38 a rotatable support 41 is secured, said support being in the form of a roller fitting snugly onto said reduced end and having said reduced end upset therein, as at 42, the opening in said roller being flared for this purpose. The roller 41 is therefore securely fastened to the shaft with the inner face thereof in contact with the shoulder of said shaft and in movable contact with the front end of the bearing sleeve and the front wall of the body portion 7 of the device. Around its outer edge this rotatable support or roller 41 is provided with a circumferential groove 43 adapted for co-operation with another part of the device, as will hereinafter appear.

The reference numeral 44 designates a pivoted shaft-bearing element, and this bearing element is preferably stamped out of sheet material and has side walls 45, an outer end wall 46, an inner end wall 47, and a top wall 48. This bearing element is therefore hollow and open along its lower side. By means of a pivot pin 49 extending through the side walls 45 of said bearing element and through the alined openings 30 in the extensions 31, 32, said bearing element is pivotally held between the side walls of the body portion of the device.

Within said pivoted bearing element 44 a bearing sleeve 50 is arranged, said sleeve extending from end wall to end wall and being soldered or otherwise rigidly secured in position.

The bearing sleeve 36 is provided with a depression 51 in its upper region, and the bearing sleeve 50 in the pivoted bearing element 44 has an opening formed in its under side to receive one end of a stud 52 serving as a spring retainer, said retainer having an outstanding stop flange 53 which bears against the under side of the bearing sleeve 50 and against which one end of an expansion spring 54 is seated, said spring surrounding said retainer and having its other end seated in the depression 51 formed in the bearing sleeve 36. This spring causes the pivoted bearing element to swing upwardly and be retained in its elevated position.

Passed through said pivoted bearing element 44, is an operating shaft 55 which, by reason of the use of the bearing sleeve 50 in said bearing, has an elongated bearing, assuring durability of the device and the stability necessary to withstand the strain applied to said shaft. This shaft is provided at its front end with a threaded reduced portion 56 onto which a circular cutter 57 is threaded, said cutter being formed of tool steel or other suitable material and having a sharp circumferential slitting or cutting edge 58. Said cutter is provided with a rearwardly-flaring boss 59 which is knurled or otherwise roughened, as at 60, adjacent the inner side of the cutter 57, for a purpose to appear hereinafter. It is to be noted that the cutter is beveled forwardly from the sharp circumferential cutting edge, as at 61.

The operating shaft 55 extends rearwardly beyond the inner wall 47 of the pivoted bearing element 44 and has a lever 62 secured thereto for conveniently rotating the shaft, said lever being spaced from said wall 47 by a nipple 63 and having a suitable handle 64 at its outer end. This lever is threaded onto the shaft 55 and held thereon by a nut 65.

The upper wall of the pivoted bearing element 44 is transversely recessed at opposite ends to form shoulders or abutments 66, 67, and a stiff curved spring 68 is provided which has opposite ends resting in said depressions and bearing against said shoulders or abutments.

A pressure device in the form of a cam lever 69 is arranged above the spring 68, said pressure device being stamped of sheet

metal and having two spaced ears 70 at its inner end. This cam lever is held between the side walls of the body portion of the device by a pivot pin 71 passed through said ears and through the alined openings 34 formed in the blank 8, as best shown in Fig. 6, which openings are in transverse alinement after forming said blank into the frame or body portion. Said pivot pin 71 is passed eccentrically through the ears 70 so that the ears serve as cams, and as the spring 54 tends to force the pivoted bearing element 44 upwardly, the upper face of the curved spring 68 is at all times in contact with the edges of said cams.

When the cam lever 69 is positioned as shown in Figs. 1 and 2, the pivoted bearing element 44 is in its uppermost position, and while in this position a can, such as shown at 72, Fig. 5, is held against the outer face of the roller 41, the seam 73 of the can, which extends out beyond the peripheral face of the body portion of the can being positioned in the circumferential groove 43 of said roller at its highest point. Thus, while holding the can with one hand, the operator uses the other hand to swing the cam lever 69 upwardly into the position shown in Fig. 5, so that the cams act against the curved spring 68 and cause the pivoted bearing member to swing downwardly against the action of the spring 54, said cam lever, when in the position shown in Fig. 5, having the points of contact of said cams beyond the dead center so that the lever will maintain the pivoted bearing element 44 in its lowered position without grasping the same. With the parts thus positioned, the upper edge of the cam is clamped between the roller 41 and the cutter 57, the can being thus suspended and requiring no further support.

It is to be noted that the top 74 of the can is somewhat depressed, this being the usual construction found in sealed cans.

When swinging the cam lever 69 from the position shown in Figs. 1 and 2 to that shown in Fig. 5, the circumferential cutting edge of the circular cutter is forced into and through the top 74 of the can, and the knurled portion 60 of said cutter lies in contact with the upper edge of the seam. Therefore, upon rotating the cutter, the can is caused to rotate by reason of the knurled or roughened portion 60 engaging the upper edge of the seam, and the top of the can is cut circularly; and due to the outwardly beveled portion 61 of said cutter acting against the severed portion of the top 74, the tendency of said cutter is to force the top downwardly adjacent its line of severance and along the region being severed, which will tilt the remainder of the cover upwardly, as clearly shown in Fig. 5, so that when the cover is almost severed from the remainder of the can, the operator may take hold of the severed portion of the cover and prevent the same dropping into the can and coming in contact with the contents thereof; this being very desirable due to the fact that the outer surface of the cover oftentimes is soiled, or has accumulations of foreign matter adhering thereto.

To aid in automatically forcing the cover outwardly from the can with the highest elevation of the same diametrically opposite the point of contact of the cutter with the cover, the operating shaft 55 is arranged at an angle to the shaft 38, thus positioning the axis of the supporting roller 41 at an angle to the axis of the cutter, which gives the beveled portion 61 of the cutter increased inclination when the operating shaft is depressed.

It will be apparent that the seam 73 of the can—which term is herein referred to as meaning the seam by means of which one wall, for example the top of the can, is secured to the surrounding wall of the can—must necessarily enclose or surround a portion of the seam of the surrounding portion of the can, and where this occurs a slight elevation or enlargement of the seam 73 will be found. Therefore, provision must be made to permit a slight movement of the cutter away from the rotatable supporting roller so as to permit this enlarged portion of the seam to pass between the two without retarding or otherwise interfering with the free operation of the device, and the curved spring 68 is provided for this purpose, it being sufficiently resistant not to interfere with the positive depression of the pivoted bearing member yet sufficiently flexible to permit a very slight independent movement of this pivoted bearing member and necessarily the cutter carried thereby so that the seam will pass freely between the two rotatable members 41 and 57.

Having thus described my invention, what I claim is:—

1. In a can opener, two co-acting rotatable members, one rigidly supported and the other movable toward and from said rigidly supported member, manually-operated means to move one of said members toward the other, automatic means for separating said members, and means serving to allow limited separation of said members when one is moved toward the other.

2. In a can opener, two co-acting members normally spaced apart, a pivoted support for one of said members, a spring holding said members separated, means to move said members into closer relation against the action of said spring, and means permitting limited separation of said members when held in close relation by said first-mentioned means.

3. In a can opener, two co-acting rotatable members, one a circular supporting member having a marginal groove at its outer edge

to receive the seamed portion of a can and the other a circular cutter adapted to bear against the seamed portion of the can to clamp said seam between the two, said cutter having a portion traveling in contact with the seam to rotate the can and the peripheral cutting edge of said cutter being adapted to cut out a wall of the can adjacent said seam.

4. A can opener, comprising a body portion having an elongated bearing, a rotatable supporting member having a shaft extending through said bearing, a pivoted bearing member above said elongated bearing, a shaft extending through said pivoted bearing member, a rotatable cutter on said shaft, a spring between said elongated bearing and said pivoted bearing member to hold said cutter in inoperative position, pressure means to depress said pivoted bearing member against the action of said spring to clamp the seam of a can between said rotatable supporting member and said rotatable cutter, and means between said pivoted bearing member and said pressure means to allow limited separation between said supporting member and rotatable cutter when passing over a seamed portion of a can.

5. A can opener, comprising a body portion having a front wall and spaced side walls, a bearing sleeve fastened into said front wall, a shaft rotatable in said bearing sleeve and extending outwardly beyond said front wall, a rotatable supporting member secured to said shaft, a pivoted bearing member between said side walls above said bearing sleeve, a spring interposed between said bearing sleeve and said pivoted bearing member, a shaft rotatable in said pivoted bearing member and extending outwardly therefrom, a cutter at the outer end of said shaft, means for rotating said shaft, and means between the side walls of said body portion above said pivoted bearing member to depress the latter against the action of said spring.

6. A can opener, comprising a body portion, a rotatable supporting member on said body portion, a vertically-movable bearing member in a plane above said rotatable supporting member and carrying a rotatable cutter, a spring serving to hold said movable bearing member elevated, and a cam lever above said bearing member co-acting therewith to depress the same against the action of said spring.

7. A can opener, comprising a body portion having side walls, a rotatable supporting member carried by said body portion, a pivoted bearing member between said side walls in a plane above said rotatable supporting member, a curved spring resting upon said pivoted bearing member, an expansion spring exerting pressure upwardly against said pivoted bearing member to elevate the same, a cam lever in contact with said curved spring and limiting the upward movement of said pivoted bearing member, a shaft extending through said pivoted bearing member, a lever at one end of said shaft, and a circular cutter at the other end of said shaft for co-action with said rotatable supporting member, said cam lever upon actuation causing the pivoted bearing member to swing downwardly against the action of said expansion spring to bring said circular cutter in operative relation to said rotatable supporting member.

8. A can opener, comprising a body portion formed of sheet metal and having a front wall and two spaced side walls, a rotatable supporting member supported by said front wall, a pivoted bearing member in a plane above said rotatable supporting member and located between said side walls, said pivoted bearing member being stamped of sheet material and having side walls, opposite end walls, and a top wall provided with abutments at opposite ends, a bearing sleeve in said pivoted bearing member having opposite ends in contact with said end walls and rigidly secured against movement, a curved spring above said pivoted bearing member having opposite ends adapted to bear against said abutments, a spring underneath said pivoted bearing member serving to elevate the same, a shaft extending through the sleeve and end walls of said pivoted bearing member, a lever secured to one end of said shaft, a circular cutter secured to the other end of said shaft, and a pressure device above said curved spring comprising a handle having depending ears eccentrically pivoted onto the side walls of said device, said ears serving to depress said bearing member upon movement of said handle to move said rotatable cutter into operating relation with said rotatable supporting member.

In testimony whereof I affix my signature.

FREDERICK A. CUYLER.