Oct. 31, 1944. W. F. MUELLER ET AL 2,361,561

CAN OPENING MACHINE

Filed March 8, 1944

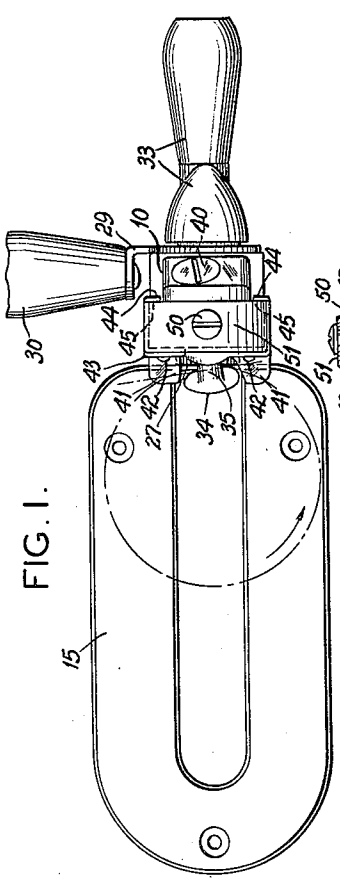


FIG. 1.

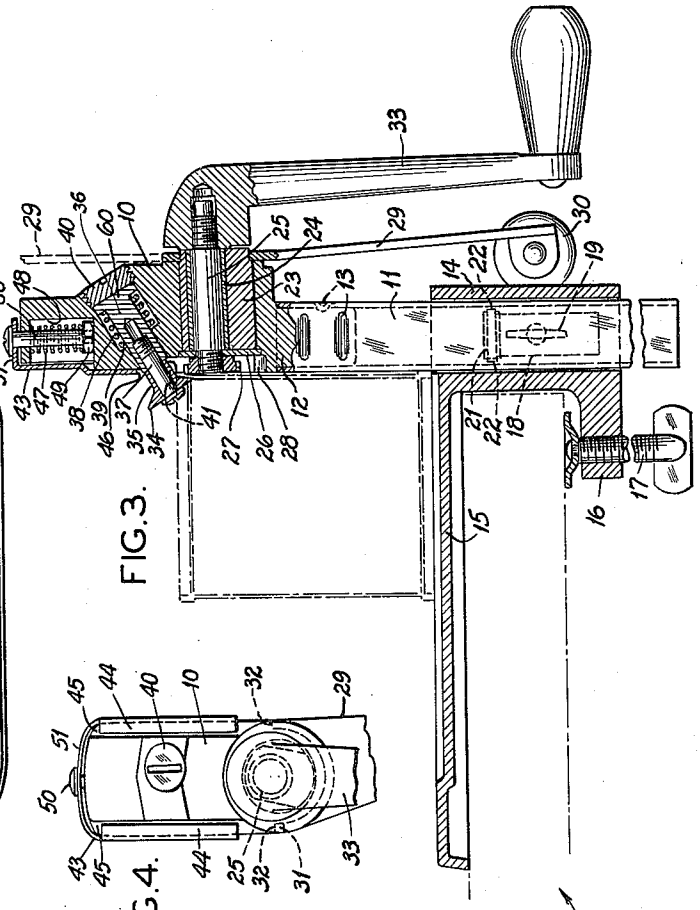


FIG. 3.

FIG. 4.

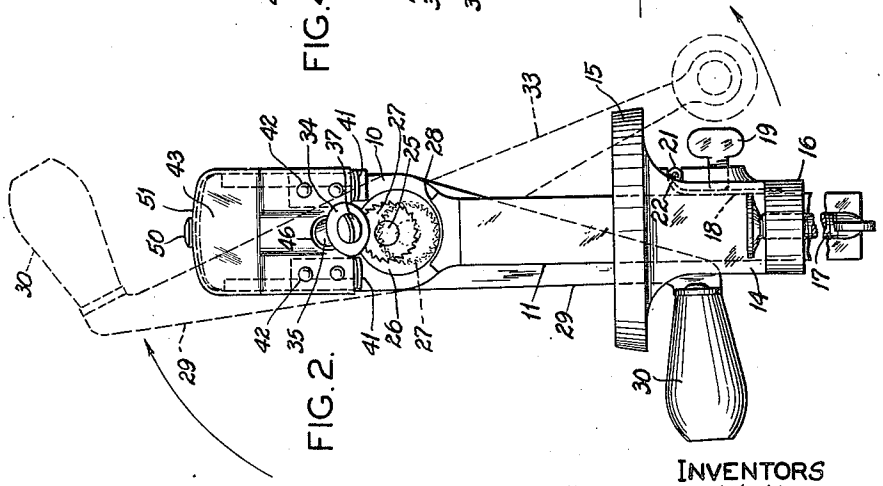


FIG. 2.

INVENTORS
FREDERICK W. KUBLIN
WILLIAM F. MUELLER
BY Lawrence H. Cohn
ATTORNEY

Patented Oct. 31, 1944

2,361,561

UNITED STATES PATENT OFFICE

2,361,561

CAN OPENING MACHINE

William F. Mueller and Frederick W. Kublin, St. Louis, Mo., assignors to Dazey Churn & Manufacturing Co. Inc., St. Louis, Mo., a corporation of Missouri

Application March 8, 1944, Serial No. 525,500

6 Claims. (Cl. 30—9)

This invention relates to improvements in can opening machines, and has particular reference to an improved device of type whereby the can is held and rotated by a feeding wheel that engages underneath the flange of the can, and the can top is severed by means of a rotatable cutting disc.

An important object of the invention is attained in the provision of an improved machine of this character which operates efficiently on cans and metal containers of a wide variety of size and shape, ranging from the smallest can used in the domestic kitchen to the large drum containers used in restaurants and public institutions.

More specifically, an object resides in improved mounting provisions for the cutting wheel, which enable that member to be adjusted and positioned with respect to the feeding wheel so that optimum operating conditions for these members can be readily obtained.

A further and related object is directed to prolonging the life of the cutting wheel and enabling it to cope with obstructions in its path of movement, as for example, an abnormal seam, a thickened portion or deformity in the flange. Such object is achieved by provisions which enable the cutting wheel to yield from its preadjusted, normal operating position, when it encounters an obstruction of this character, and causes it to return to that position when the obstruction has been passed.

Another object is directed to the provision of an improved pressure shoe or hold-down structure which maintains the can in proper operating engagement with the feeding wheel and prevents the can from tilting as the top is being severed.

Yet another object is achieved in an adjustable stand or support of improved character whereby the operating mechanism of the machine may be quickly adjusted vertically, and secured in the adjusted position to adapt the machine to cans of different height.

Other objects are obtained in the hereinafter described construction, combination and arrangement of parts which make for a highly efficient and durable heavy-duty can opener.

In the accompanying drawing setting forth an exemplary embodiment of our invention,

Fig. 1 is a top plan view;

Fig. 2 is a front elevational view;

Fig. 3 is a sectional side view, and

Fig. 4 is a rear view of the operating or head portion of the machine.

Referring now by numerals of reference to the drawing, the various parts which constitute the operating mechanism of the can opener are mounted on a head member 10, preferably a metal casting, which member is rigidly secured to the upper end of a square-sectioned tubular column 11. As a preferred method of uniting the numbers 10 and 11, the former is provided with an integral depending neck 12 which fits snugly within the upper end of the column 11 and is secured therein by depressing the linear areas 13 of the column into preformed transverse recesses in the neck 12. Column 11 extends through the square bore of a collar 14 which is formed as an integral portion of a base plate casting 15, the collar 14 projecting downwardly from one end of the base plate as shown. An integral lug 16 at the lower end of collar 14 is suitably drilled and threaded to accommodate the threaded shank of a clamp screw 17 by which the base plate 15 is adapted to be clamped to a table or other suitable horizontal support.

From the description thus far it will be understood that the column 11 is adapted to be adjusted vertically and to be secured in its adjusted position so as to fix the operating head of the machine a distance above the table or support best suited to the height of the particular can to be opened. To secure the column in adjusted position there is provided an extremely simple, yet highly effective clamping device consisting of a flat shoe member 18 which normally occupies an internal recess or longitudinal channel-like formation in the side of collar 14, and is adapted to be pressed inwardly against the side of the column by means of a thumb screw 19. The pressure shoe 18 is loosely hinged at its upper end to the wall of the collar, being so connected and held against removal from the collar by a laterally off-set, reversely bent head end 21 which extends through an opening in the collar wall. Lugs 22 at the opposite edges of the head 21 project beyond the margins of the wall opening and limit inward displacement of the head end of the shoe.

Turning now to a description of the operating head and particularly the can driving or feeding mechanism, the head casting 10 has a horizontal bore in which is journalled a bearing cylinder 23. Cylinder 23 has an eccentric bore lined by a bearing sleeve 24 in which is journalled the feed wheel shaft 25. A washer 26 of greater diameter than the bearing cylinder 23 seats against the forward end face thereof and is provided with an eccentric opening to accommodate the

threaded end portion of shaft 25, on which portion is mounted the peripherally toothed feeding wheel 27. The outer face of the feeding wheel lies substantially flush with the vertical front surface of a subjacent shoulder 28, formed integrally on the head casting, and likewise with the front surface of column 11. The bearing cylinder or eccentric 23 projects rearwardly from the head casting and secured in a suitable manner to the projecting path is an actuating member 29 which carries a manipulating knob 30 at its end, said knob being mounted to project laterally from the member as shown. The eccentric 23 is limited to a 180 degree range of arcuate movement by the engagement of a lug 31 (Fig. 4) on member 29 with stop shoulders 32 on the head casting. When the feeding wheel 27 is moved by the eccentric to its uppermost position, which is the operating position of the feeding wheel, the eccentric handle 29 extends vertically downwardly. Movement of the eccentric handle to the opposite limit position, or vertically upwardly as shown in dotted lines in Fig. 2 shifts the feeding wheel downwardly away from the cutting disc. The feeding wheel is rotated by means of a crank 33 threadedly connected to the shaft 25.

The cutting disc 34 consists of a hardened steel wheel the opposite sides of which converge to a sharp cutting edge. An integral collar or neck portion 35 projects axially from the inner side of the disc and abuts the outer end face of a plunger member 36 to which the cutting disc is rotatively attached by means of an axle stud 37, the latter consisting of a screw threaded into an internally threaded bore in the plunger member. The plunger member occupies a bore in the head casting, which bore extends through the head casting at an angle to the axis of the feeding wheel. A part of the said bore is of enlarged diameter to accommodate a coil spring 38 that encircles the plunger, the spring 38 being normally held in a compressed condition with its lower end seating against a shoulder 39 and its upper end pressing against an enlarged head portion 60 of the plunger. Spring 38 presses the plunger inwardly, which has the effect of urging the cutting disc 34 inwardly, or in the direction to reduce the space between the cutting disc and the feeding wheel.

The proper relative spacing of the cutting disc and feeding wheel is of great importance when these members are cooperating to open a can. If the space is too great an irregular, ragged cut results, and the flange is apt to slip through the space causing the can to become detached from the operating members of the machine. Where the inner face of the cutting disc is too close to the outer face of the feeding wheel the cutter tends to shear or shave particles of metal from the flange, which particles generally and undesirably find their way into the contents of the can. A satisfactory spacing of these members has been found to be approximately twice the thickness of the can metal.

The cutting disc 34 is provided with adjustment means for the purpose of regulating the spacing aforesaid. Such means include a plug 40 that forms a closure for the rear end of the plunger bore and further constitutes an adjustable abutment for the plunger 36, which plunger is forced against the plug by spring 38. Plug 40 is threaded in the bore and is provided with a diametral kerf for engagement by a screwdriver. It will appear that the cutting disc is capable of outward movement, opposed by the spring 38, to permit a seam or other thickened portion of the can wall to pass between the members, yet its normal spacing with respect to the feeding wheel is determined by the position of the abutment plug 40, which, as has been explained, may be adjusted by threading the same into or out of the bore.

It has heretofore been mentioned that the axis of the cutting wheel 34 extends at an angle to the axis of the feed wheel 27. The vertical angular relationship of these axes clearly appears from Fig. 3. It will further appear from Figs. 1 and 2, that the cutting wheel axis is slightly angularly displaced from a vertical plan extending through the feeding wheel axis. This so-called horizontal angular displacement or canting of the cutting wheel is in such direction as to cause said wheel to toe inwardly toward the adjacent can rim, or such that its forward or entering edge lies closer to the said rim than does the trailing edge of the cutting wheel. By mounting the cutting wheel in the described canted position the wheel is better adapted to make a smooth, regular cut close to the rim.

As means for holding the rim of the can firmly down upon the toothed surface of the feeding wheel so that driving traction of wheel on the can is assured, there is provided a pair of vertically yieldable pressure feet 41 which are arranged to bear downwardly on the can rim at points circumferentially before and behind the cutting disc. These pressure feet consist of L-shaped members which are secured as by rivets 42 to a movable housing plate 43. The said housing plate is mounted to slide vertically on the head casting 10 and is provided with channelled side portions 44 which slide on vertical guide rails 45 formed at the sides of the head casting. A slotted opening 46 in the front wall of the housing plate accommodates the shaft and neck portion of the cutting disc. Downward pressure is exerted on the slidable housing plate and transmitted through said plate to the pressure feet 41, by the action of a compression coil spring 47 which is ensconced in a vertical recess 48 in the head casting. Spring 47 bears downwardly on a nut 49 threaded on the lower end of a screw 50 that extends through the spring and through an opening in the upper end of the head casting. The enlarged slotted head of the screw seats upon the top wall 51 of the housing plate.

The operation of the opener is as follows:

The eccentric handle 29 is first raised to a vertical position causing the feeding wheel to become spaced downwardly from the cutting disc, as shown by broken lines in Fig. 2. The flange of a can may now be inserted so that it extends behind the lower edge of the cutting disc and above the feed wheel. Where a large, heavy can is to be opened the foregoing step is best accomplished by resting the can on the base plate 15 with its side positioned against the column 11, and then lowering the head structure to bring the cutting disc into contact with the can top, adjacent the inner side of the flange. The eccentric handle is then swung downwardly, forcing the feeding wheel upwardly against the shoulder formed by the lower edge of the flange. Such action of the feed wheel tends to move the can upwardly so that its top becomes punctured by the lower edge of the cutting disc. The pressure feet or hold-down members 41 contact the flange at points fore and aft of the cutting disc and exert downward pressure on the flange to hold it tightly against the feeding wheel. Now, when the feeding wheel is turned by crank 33 it rotates the can

and causes the top thereof to be cut out by the cutting disc. When opening smaller cans the operation may be facilitated by securing the column by means of the thumb screw 19 to hold the operating mechanism at a convenient working height.

We have described our invention with reference to a particular operating embodiment, but it will be understood that certain changes can be made in the device herein described without departing from the spirit and full intendment of the invention which is defined by the appended claims.

We claim:

1. A can opening machine comprising a body member, cutting and feeding wheels rotatably mounted on the body member, means for bodily moving the feeding wheel in a direction transversely of its axis, toward and from an operating position underlapping said cutting wheel, and means for moving said cutting wheel axially, to vary the distance between lapped portions when said wheels are disposed in operating position.

2. A can opening machine comprising a body, coacting cutting and feeding wheels rotatable thereon, means for bodily moving the feeding wheel in its own plane, toward and away from an operating position wherein its upper portion extends beehind the lower portion of the cutting wheel, mounting means for the cutting wheel including a shaft, and a threaded member for moving the shaft and cutting wheel axially, whereby to vary the spaced relationship of said wheels.

3. A can opening machine comprising a body, coacting cutting and feeding wheels rotatable thereon, means for bodily moving the feeding wheel toward and from an operating position underlapping the cutting wheel, means mounting said cutting wheel for axial movement toward and away from the feeding wheel, said means comprising a member slidable in a bore formed in the body, an adjustable stop element for limiting movement of said member in a direction tending to decrease the distance between said wheels, and a spring acting to urge said member against said stop element.

4. A can opening machine comprising a body member, a horizontal shaft journalled therein, a feeding wheel secured to the outer end of said shaft, said feeding wheel having a toothed periphery for driving engagement with the under-surface of the flange of a can supported thereon, a plunger shaft disposed in a bore in the body member above said feed wheel shaft and extending at an angle thereto, a cutting disc rotatably carried on the inner end of said plunger shaft, axially beyond said feeding wheel, a coil spring through which the plunger shaft extends, said coil spring acting on the plunger shaft to urge the cutting disc inwardly toward the feeding wheel, and a threaded plug member forming a closure for the outer end of said bore and providing an axially adjustable abutment for the outer end of said plunger shaft.

5. In a can opening machine including a body member having an inclined bore extending transversely therethrough, a feeding wheel mounted on the side of the body member subjacent the lower end of said bore, a plunger slidable in said bore, a member threaded in the upper end of said bore, providing an axial adjustable abutment for said plunger, a spring extending around said plunger in the bore, said spring acting on the plunger to urge it against the abutment, and a cutting wheel having a conical inner surface, said cutting wheel being rotatively mounted on the lower end of said plunger such that a lower portion of said conical wheel surface is parallel to and is adapted to be variably spaced away from the outer face of said feeding wheel.

6. In a can opening machine of the character described, including a body member, a rotatable feed wheel mounted on the body member and arranged to engage the under surface of the flange of a can, an inclined passage extending through the body member, a plunger reciprocable in said passage, a cutting wheel arranged to engage the top of a can adjacent the flange engaged by said feed wheel, said cutting wheel being rotatively mounted on said plunger for axial movement toward and from the outer face of said feeding wheel, said plunger being canted so that the forward or cutting side of said cutting wheel will be closer to the flange of the can than its trailing side, threaded means providing an adjustable abutment for limiting inward movement of said plunger, and a spring acting inwardly on said plunger and adapted yieldably to urge the plunger against said abutment.

WILLIAM F. MUELLER.
FREDERICK W. KUBLIN.