Nov. 29, 1938. J. W. FLUHARTY 2,138,538

DESTRUCTIBLE DRUM OPENER

Filed April 30, 1937 2 Sheets-Sheet 1

FIG. 1.

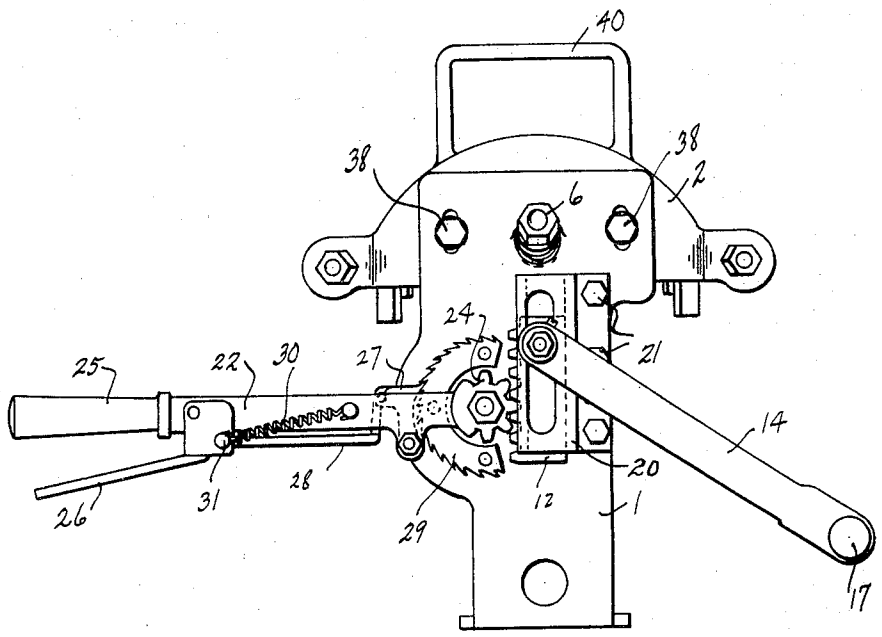
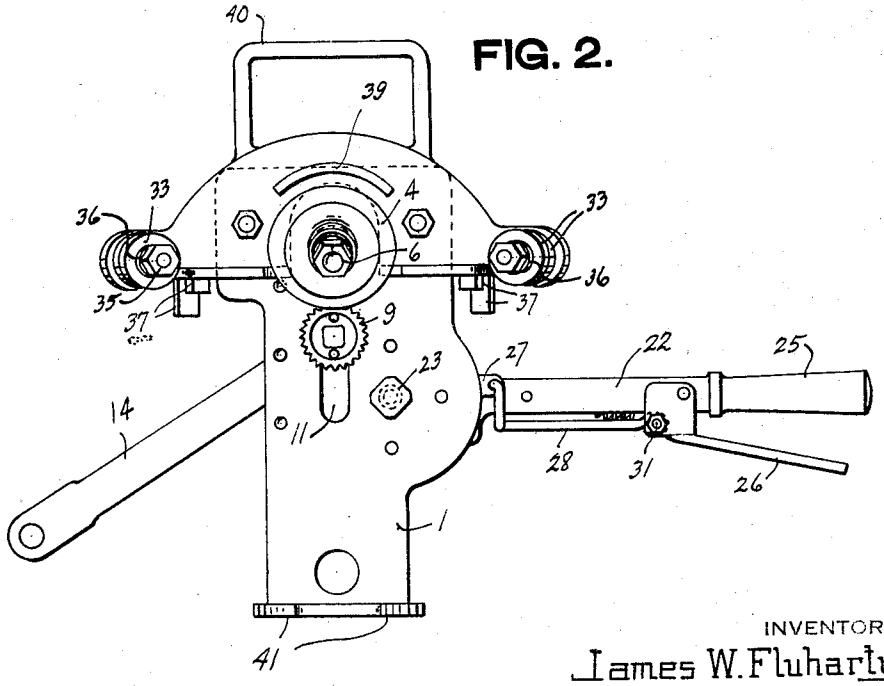


FIG. 2.



INVENTOR.
James W. Fluharty.

BY Lyman B. Morris

ATTORNEY

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Filed April 30, 1937 2 Sheets-Sheet 2

FIG. 3.

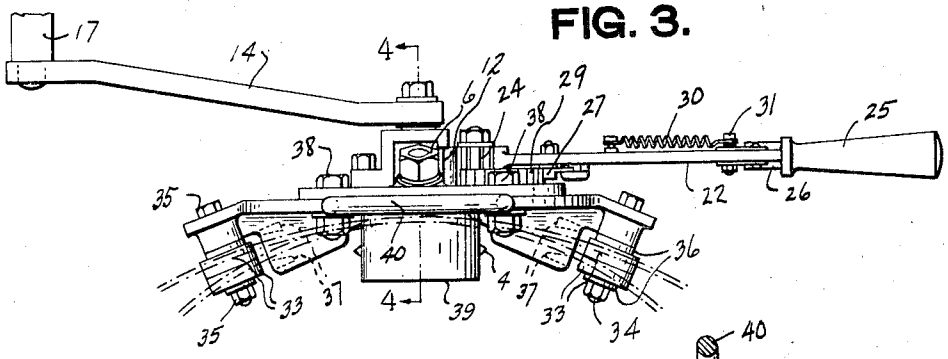
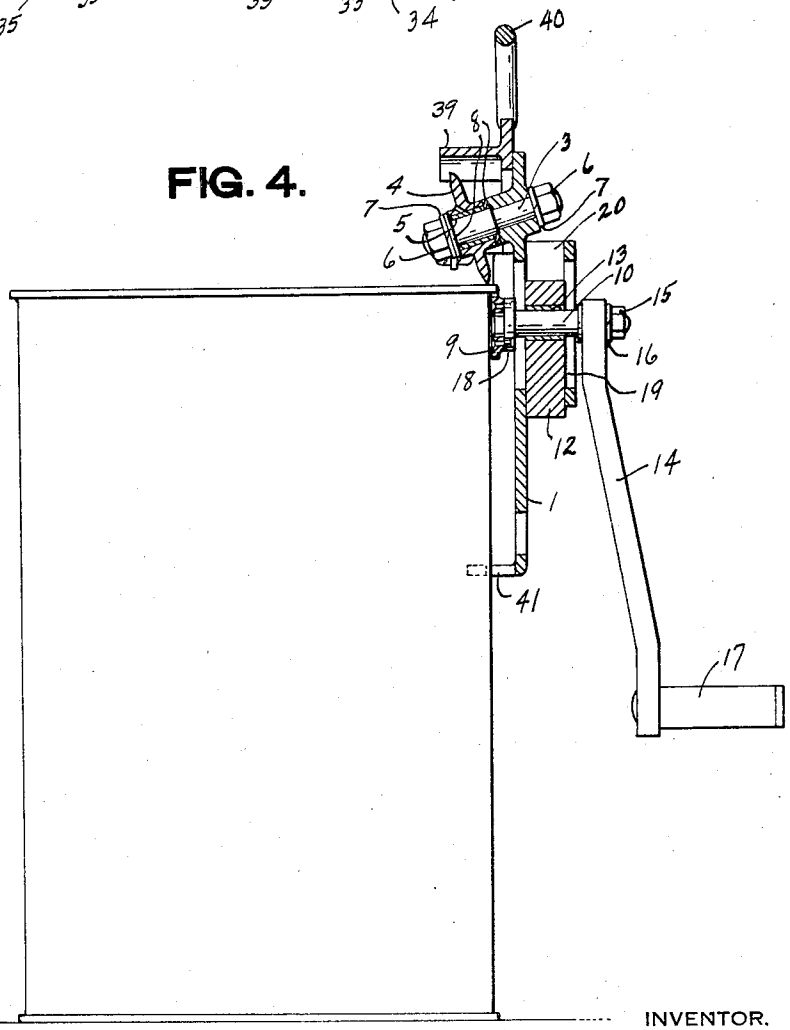


FIG. 4.



INVENTOR.

James W. Fluharty.

BY Lyman B. Morris

ATTORNEY

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UNITED STATES PATENT OFFICE

2,138,538

DESTRUCTIBLE DRUM OPENER

James W. Fluharty, Penns Grove, N. J., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware

Application April 30, 1937, Serial No. 140,034

8 Claims. (Cl. 30—15)

This invention relates to can openers, more particularly it relates to can openers suitable for use in opening large cans or drums, still more particularly it relates to portable drum openers and still more particularly it relates to drum openers which are easily maintained in an operating relationship with a drum. The invention in a more limited sense relates to drum openers having new and improved latching, guiding and cutting means.

At the present time there are commerciably available no can openers which are useful in opening large cans or drums which have capacities of from 10 to 60 gallons and higher. So far as I am aware there are no drum openers made which are portable. Due to the widespread practice in the chemical and related industries of packaging raw materials in large destructible drums a need for an efficient drum opener has become acute. Industrial workers commonly open drums of the destructible type with an axe or similar dangerous sharp instrumentality. Consequently injuries are quite frequent and many of them are serious. In the chemical industries reactants which are packaged in destructible drums must be opened quickly in order that production schedules may be maintained free from interruptions. Furthermore liquid and toxic chemicals etc. are frequently packaged in large cans or drums of the destructible type and they must be opened with care to avoid losses by spilling and to safeguard health.

It is an object of this invention to provide an opener whereby a large can or drum may be safely opened. A further object is to provide an efficient portable drum opener. A further object is to provide an opener whereby drums can be quickly and neatly opened and the drum is free from jagged edges. A still further object is to provide an opener which is adapted to remove the head of a drum at a point adjacent its outer circumference. A still further object is to provide an opener which will maintain a drum in an operative position during an entire cutting operation. Another object is to provide an opener which maintains the head of a can or drum in a non-spilling position during an opening or cutting operation. Another important object is to provide an opener for large drums of the destructible type which is portable. Other objects will appear hereinafter.

The above and other objects are accomplished by the device described below and illustrated in the accompanying drawings, wherein similar reference numerals refer to similar parts throughout the several views.

Fig. 1 is a rear elevation of my portable drum opener in an assembled relation;

Fig. 2 is a front elevation of the same;

Fig. 3 is a top or plan view of the same;

Fig. 4 is a vertical sectional view taken along the lines 4—4 of Fig. 3 showing the opener on a large drum.

Referring now more particularly to the drawings a vertical frame 1 is provided at its upper end with a guide frame 2 which may be adjusted with respect to the support 1. A shaft 3 is fixedly mounted near the upper end of vertical frame 1 upon which is rotatably mounted a cutter 4 which is provided with a bushing 5. The shaft and cutter are retained upon the vertical frame member by means of nuts 6 and lock washers 7. Thrust washers 8 are preferably placed upon each side of the rotary cutter.

A gripping roller 9 which has a knurled or toothed peripheral surface is slidably mounted upon the vertical support by means of shaft 10 which extends through elongated slot 11 in vertical frame 1. The shaft 10 however is fixedly attached to gripping roller 9. A rack member 12 is also mounted upon the shaft 10. A bushing 13 surrounds shaft 10 in the rack member. Crank 14 is attached at the outer end of shaft 10 by means of nut 15 and lock washer 16. The outer end of crank 14 is provided with a handle 17. A wear plate 18 is placed next to gripping roller 9 and slidingly engages with vertical frame member 1 on the opposite side of slot 11 from rack member 12. The wear plate may be fixedly connected to gripping roller 9 if desired. The shaft 10 also extends through an elongated slot 19 in Z-shaped bracket 20 which is fixedly mounted upon the vertical frame by means of bolts 21. The rack slides up and down the vertical frame in the space between the same and bracket 20. An arm member 22 is rotatably mounted upon a stub shaft 23 which is fixedly mounted upon vertical frame 1. The inner end of the arm which immediately revolves about stub shaft 23 forms a pinion gear 24 which engages with rack member 12. The outer end of arm 22 has a handle portion 25 and a pivoted lever 26 in close proximity thereto. The pivoted lever 26 is operatively connected to a pivotally mounted pawl 27 by means of link 28. Pawl 27 is mounted upon arm 22 near the inner end thereof for engagement with ratchet member 29 which is fixedly mounted upon vertical frame 1. A spring member 30 which is operatively connected to lever 26 by means of pin 31 and to arm

22 holds pawl 27 in locked relationship with ratchet 29. The guide frame member 2 is provided with a pair of spaced guide rollers 33 which are disposed a short distance above the locus of the cutter 4. The guide rollers are mounted upon stub shafts 34 which are similar in construction to shaft 3 and which are maintained in position by means of nuts 35. The rollers may be mounted upon plain or antifriction bearings such as roller or ball bearings and may also be provided with thrust bearings or washers 36. The guide rollers 33 engage the rim of a drum during a cutting operation and prevent the opener from tipping relative to the drum and also reduce friction during a cutting operation. The rollers may be interchangeable if desired so that a drum having a large or small radius of curvature may be accommodated. In general rollers having a diameter of one to one and one half inches and a width of three-quarters to one inch will be sufficient for the usual sizes of commercial destructible drums.

A pair of U-shaped frictional guide members 37 are also mounted upon guide frame member 2 at spaced points in close proximity to guide rollers 33. One of the legs of the U-shaped guide members 37 is longer than the other and is adapted to engage the periphery of a drum. The short leg of the U-shaped member extends over the rim of a drum during a cutting operation. The U-shaped guides as shown consist of two legs which are welded to an inturned bottom edge of guide frame member 2. The guides in question may be made detachable and replaceable if desired.

The guide frame member 2 may be integral with vertical frame 1, welded or otherwise permanently affixed thereto. In the preferred construction the two frame members 1 and 2 are separable and adjustably attached to each other by means of bolts 38. By making the parts adjustable the rotary cutter may be adjusted relative to the gripping roller and thereby compensate for wide differences in drum rim and head thicknesses. Furthermore as the cutting and gripping rollers wear an adjustment may be made. Guide frame member 2 may also be provided with a guard member 39 which covers the top of rotary cutter 4. It may also be provided with a handle 40 which may be separate or integral therewith.

The Z-shaped bracket member 20 may be likewise integral with vertical frame member 1 instead of separate and detachable therefrom. The bottom of vertical frame 1 may be turned in to form a pair of frictional shoes 41 for engagement with the periphery of a drum during a cutting operation. The shoes may be removable or integral with the vertical frame 1.

In the operation of the device the rotary cutter is disposed over the inner edge of a drum so that it rests upon the head of the same. The lever 22 is then pressed downwardly which raises gripping roller 9 into contact with the lower edge of the drum rim. By using a slight force the rotary cutter pierces the top of the can. A slight rocking action facilitates the piercing action. At this point the opener is fixed upon the drum since the ratchet and pawl holds the operating mechanism in a locked position. Then the crank 14 is turned and gripping roller 9 causes the opener to turn relative to the drum and fresh metal surfaces are continuously brought into contact with rotary cutter. The crank is turned until the gripping and cutting rollers have made a complete revolution of the periphery of the drum rim. As a result of this operation the head of the drum is completely cut out.

During the cutting operation the guide rollers prevent the opener from tipping relative to the drum. The U-shaped guides and frictional guide shoes help to maintain the opener in a good operating relationship. By placing cutting roller 4 at an inclination to the vertical position it does not tend to slip and ride up on to the edge of the can rim. Also by this feature the cut edge of the can is forced against the side wall and a smooth inner surface free from jagged edges and flanges is obtained.

While the form of the present invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted without departing from the spirit and substance of the broad invention, the scope of which is commensurate with the appended claims.

I claim:

1. A drum opener comprising a guide frame having a rotary cutter and a plurality of guiding elements thereon for engagement with a drum, a vertical frame member adjustably attached to the guide frame having a gripping roller carried thereby and vertically shiftable toward and away from the rotary cutter, a rack and gear mechanism for shifting said gripping mechanism, a ratchet and pawl mechanism for positively locking the gripping roller in operative position and separate means for rotating the same.

2. A portable destructible drum opener comprising a vertical frame member, a gripping roller carried thereby, a rack and gear mechanism for shifting the gripping roller, a ratchet and pawl mechanism for locking the roller and rack mechanism in operative relation, a rotatable cutter and means for rotating the gripping roller.

3. A portable drum opener comprising a vertical frame member having a frictional shoe member at its lower end, a shiftable gripping roller means for shifting the same and means for locking the same in position mounted near the upper end of said frame member, means for rotating said gripping roller, a guide frame adjustably connected to the upper end of the vertical frame having a cutting roller rotatably mounted thereon and a plurality of guide members mounted thereon, some of said guide members preventing tilting of the device relative to a drum and others preventing the opener from moving away from a drum during a cutting operation, said guide members being spaced upon each side of the cutting roller and in substantial alignment with the cutting edge of said roller.

4. A drum opener comprising a guide frame having a rotary cutter, a pair of spaced guide rollers for engaging the upper edge of a drum and a pair of spaced U-shaped guide members for the drum rim mounted thereon, a vertical frame adjustably attached to said guide frame having a pair of frictional guide shoes at its lower end for engagement with a drum, a gripping roller shiftably mounted on said vertical frame for engagement with a can rim, means for rotating said gripping roller and means for locking it in an operative position.

5. A drum opener comprising an adjustable guide frame having a rotary cutter, a guard plate therefor, a roller guide on each side of said cutter in the same horizontal plane therewith and a pair of frictional guides mounted thereon between said cutter and roller guides, a vertical

frame member having a gripping roller carried thereby and vertically shiftable toward and away from the rotary cutter, means for locking the gripping roller in operative position and separate means for rotating the same.

6. A portable drum opener comprising an adjustable guide frame having a handle, a rotary cutter, a guard plate therefor, a roller guide on each side of said cutter in the same horizontal plane therewith and a pair of frictional guides mounted thereon between said cutter and roller guides, a vertical frame member having a gripping roller carried thereby and vertically shiftable toward and away from the rotary cutter, a rack and gear mechanism for shifting said gripping mechanism, a ratchet and pawl mechanism for locking the gripping roller in operative position and separate means for rotating the same.

7. A portable drum opener comprising a guide frame having a rotary cutter, a guide roller and a U-shaped guide member mounted thereon on each side of said cutter and substantially in a line with its cutting edge for engagement with a drum rim, a vertical frame adjustably attached to said guide frame having a frictional guide shoe at its lower end for engagement with a drum, and a gripping roller carried thereby, a rack and gear mechanism for shifting the gripping roller, a ratchet and pawl mechanism for locking the gripping roll and rack mechanism in operative relation and means for rotating the gripping roller.

8. A portable destructible drum opener comprising a vertical frame member, a gripping roller carried thereby, a rack and gear mechanism for shifting the gripping roller, the gear having an integral extended handle portion which is provided with a pawl and a tripping mechanism therefor, a ratchet mounted upon the vertical frame member which engages with the pawl for locking the roller and rack mechanism in operative relation, a rotary cutter and means for rotating the gripping roller.

JAMES W. FLUHARTY.