April 6, 1937. F. C. WOELFER, JR 2,076,215

CAN OPENING DEVICE

Filed June 9, 1936

Fig. 1

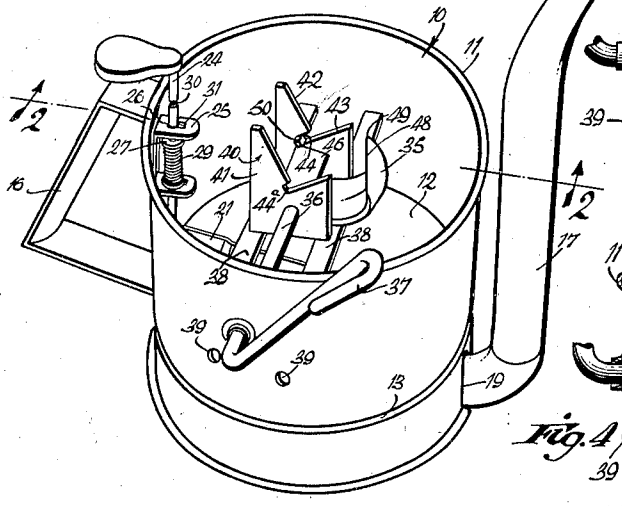


Fig. 3

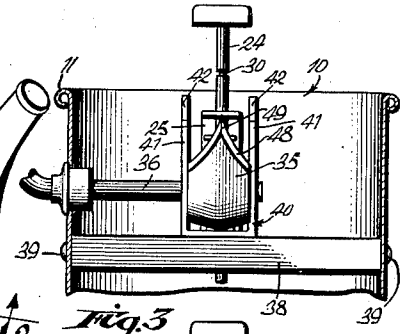


Fig. 4

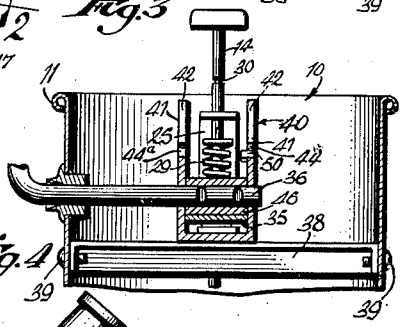


Fig. 6

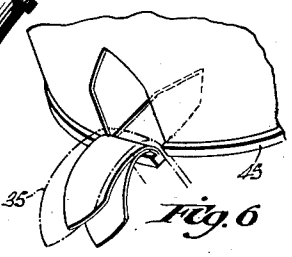


Fig. 2

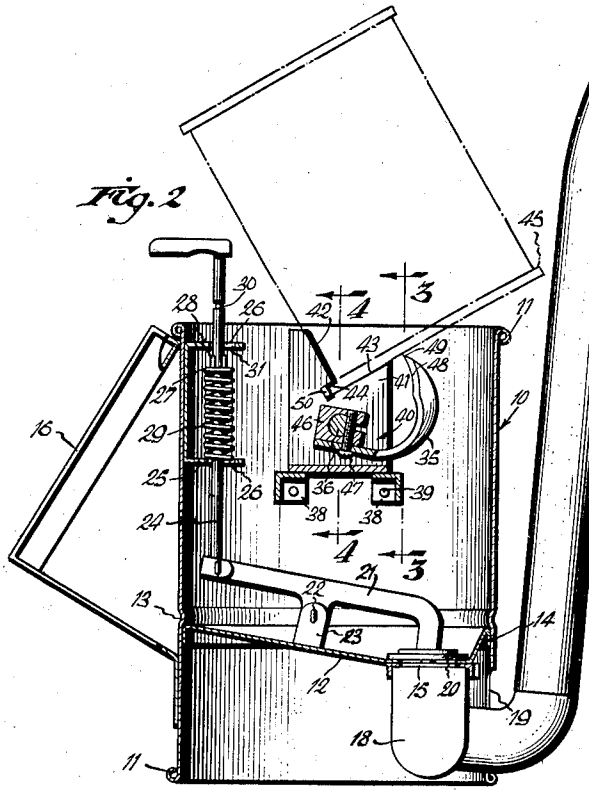
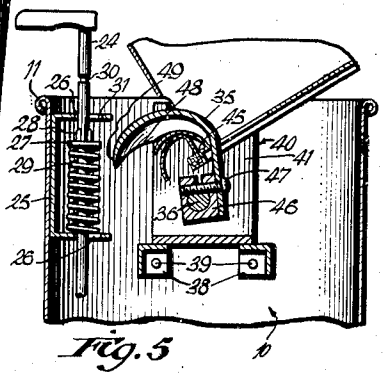


Fig. 5



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2,076,215

CAN OPENING DEVICE

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Application June 9, 1936, Serial No. 84,320

14 Claims. (Cl. 221—23)

This invention relates to dispensing means for delivering a liquid to the point of use, such as lubricating oil to the crank case of an engine, and is particularly directed to a dispenser of the type adapted to receive the contents of a sealed original container or can, which incorporates cutter means for opening the sealed container within the dispenser.

The major oil companies are supplying their particular brands of oil to the trade in sealed containers of certain sizes such as one quart, five quarts, etc. These cans have lithographing thereon identifying the brand of oil and its particular manufacturer. If the can is opened by means entering the end wall only thereof, the lithographed matter usually placed on the side of the can is not damaged. It is then possible for unauthorized persons to re-use the can by repairing the wall and refilling the can with inferior oils, utilizing the benefits of the lithographing on the can for price purposes.

The conventional can opener has the fault that it does not damage the can sufficiently enough to render it completely unfit for further use. Moreover, drainage of oil from the can has not been efficient due to the position of the can in the dispenser, the shape of the opening and its relation to the walls and seam of the can.

It is the object of the present invention to provide a dispenser adapted to receive and direct lubricating oil to the crankcase of an engine; which incorporates a conveniently operable can opening device; which supports the can in an inclined position while opening the same and thus provides for complete drainage of the contents of the can; which is effective for cutting through the lowermost corner of the can, that is, two walls of the can adjacent a seam, such as the bottom and a side; which destroys a portion of the lithographing on the can, rendering the can unfit for further use; which is effective for cutting the seam of the can, further destroying the can; which adequately supports the can in position while being opened without the necessity for the operator to hold the can in position; which cuts out a large portion of the corner of the can at the same time, and although breaking through the seam does not completely sever the same so that the cut-out portion does not drop into the dispenser, and will therefore in no manner interfere with the operation of the dispenser valve mechanism or the drainage of oil from the dispenser; which incorporates a removable knife which can be conveniently replaced when necessary and is formed and operates in a manner tending to hold the can firmly in position as the cut is made; and which includes leverage means for operating the knife in an efficient manner for procuring maximum pressure when the seam is being cut.

Other objects and certain advantages will be more fully apparent from a description of the accompanying drawing, in which:

Figure 1 is a perspective view of a dispenser incorporating the present improvements.

Figure 2 is a sectional view taken on line 2—2, Fig. 1, showing a sealed can in dot and dash lines in position for opening.

Figure 3 is a fragmentary sectional view taken on line 3—3, Fig. 2, showing details of the can opener knife and its operating means.

Figure 4 is a fragmentary sectional view taken on line 4—4, Fig. 2, further detailing the knife.

Figure 5 is a fragmentary sectional view taken similar to Figure 2, showing the knife toward the completion of the can opening operation.

Figure 6 is a perspective view of a portion of the can after the opening operation, detailing the position of the cut-away portion at the conclusion of the cut.

The present improvements provide means whereby a sealed can of oil may be placed relative to a dispenser and automatically held in position while a lever is swung for breaking out a corner of the can, the can being held in an inclined position and the knife acting to break out the lowermost corner, whereby drainage of the oil from the opened can can take place quickly and completely.

Referring to the drawing, the body of the dispenser is in the form of a cylinder, indicated at 10. The upper and lower ends of the cylindrical purpose are beaded, as at 11, for the purpose of strengthening the same and providing a rigid and rounded support edge on which the receptacle rests. The bottom 12 of the receptacle is spaced upwardly from the lower end of the cylindrical body thereof, and is positioned against an inwardly projected annular bead 13.

The bottom is pressed out to provide a downwardly turned marginal flange 14 fastened to the inner side wall of the cylindrical body 10 by welding, brazing, or any other suitable means. The outlet 15 of the bottom is disposed eccentrically with relation to the axis of the dispenser, and the bottom slopes to this outlet for complete drainage. The outlet is located forwardly of the dispenser with respect to the handle 16 thereof.

A spout 17 includes a fitting 18 attached to the outlet 15 of the bottom. A swivelling connection

is provided between the spout and the fitting, the fitting being located in the space beneath the bottom of the dispenser in the lower edge thereof. As shown in Figure 2, the spout 17 extends upwardly, well above the top of the dispenser, and is of sufficient length for reaching the oil intake for the engine.

The forward wall of the cylindrical body 10 is cut away as at 19 below the bottom to provide clearance for the spout during its swivelling movement. The details of the swinging or swivelling spout are not disclosed since they are well understood in the art and any conventional type may be utilized.

A leather valve 20 is rigidly attached to the forward end of a lever 21, fulcrumed on a pin 22 carried by fulcrum bracket 23 secured to the bottom of the dispenser. An operating rod 24 has its lower end attached to the rear end of the lever 21, and is slidably mounted in a bracket 25 fixed to the back of the dispenser.

The bracket provides upper and lower arms projecting toward the center of the dispenser. These arms include openings 26 traversed by the rod. A stop washer 27 is mounted on the actuating rod and limited as to upward movement by means of radial ears 28 pressed in the rod. A coil spring 29 is mounted under compression between the washer and the lower arm of the bracket 25 and urges the rod upwardly at all times for holding the valve in seated position on the margin of the outlet under pressure.

An annular groove 30 is formed in the rod above the bracket and is adapted to cooperate with a forward extension of the opening in the upper arm of the bracket. As the rod is lowered it brings the annular groove into the plane of the upper arm and the extension or slot 31 permits forward movement of the rod when the valve is opened. The lower shoulder of the annular groove then engages the arm and prevents upward movement of the rod, automatically maintaining the valve in open position.

The can opening knife 35 is secured on a rod 36. The rod projects through the wall of the dispenser and is directed angularly upwardly and looped to form a handle as at 37. The can is mounted or supported with respect to the knife by the following means: Cross rails 38 of angular cross section extend between the respective sides of the dispenser and are secured thereto by means of screws 39. A U-shaped support 40 is fixed upon the cross rails centrally thereof. The upwardly projected arms 41 of the U-shaped support are notched out to provide edges 42, 43, disposed at right angles to each other, the lower edges 43 adapted to contact the bottom of the can and the side edges 42 adapted to contact the side of the can. The angularly related edges are tipped rearwardly so as to correspondingly tip the can.

Notches 44, 44a, at the intersection of the edges receive the bead 45 at the lower edge of the can. With the can in the position shown in Figure 2, it is supported on the respective arms of the U-shaped support, and registry of the beaded edge of the can prevents upward movement thereof along the surfaces 42, 42.

The knife element is of hook form, being substantially in a reverse curve from the point of its support when regarded longitudinally. It is formed from a flat plate of cutting steel, the attachment portion being secured to the under side of a clamping block 46.

The block is traversed by the cutter operating rod, and is split from the bore outwardly in a plane lying along the axis of the rod. Screws 47 traverse the cutter element, the block and one side of the rod, being screwed into the upper part of the block so as to draw the split portions together on the rod. The cutting end of the blade or knife is curved in a transverse plane, and includes tapered side edges 48 converging to form the penetrating point 49 of the knife. Additionally, the edges are chamfered to provide sharpened edges and the cutting point of the knife.

A stop 50 is turned inwardly from one arm of the can support at the base of the bead receiving slot thereof. The turned lug constituting the stop limits cutting movement of the knife since the edge of the knife presses an uncut portion of the bead of the can against this stop at the conclusion of the cutting swing of the knife. The opposite edge of the knife passes the bottom of the slot 44a in the other arm containing the bead, and the bead is cut through on this side as shown in Figure 6. The slot 44a is not as deep as slot 44 and it therefore occurs that the knife passes the bottom of this slot in its swing for the purpose of complete severance of the bead at this point.

The destruction of the bead plus cutting through the side wall of the can which incorporates the lithograph renders the can completely unfit for re-use. The portions of the can which have been severed from the body of the can cannot drop into the dispenser due to the failure to sever at one edge of the knife. Absolute drainage of oil can take place since the cut opening is disposed at the lowermost portion of the can as supported. The cut is complete, there being no pocket left in which the oil can be trapped. The break through the seam eliminates any possibility of oil remaining in the can.

As the knife first contacts the bottom of the can, as shown in Figure 2, there is a tendency to slide the can upwardly along the back edges of the support. This movement cannot occur however due to the engagement of the bead or lip of the can against the top walls of the notches 44, 44a, in which it is contained. There is very little resistance to initial entry of the knife. As the cut progresses, the general direction of application of cutting pressure changes.

As shown in Figure 5, in the final stages of the cut the general direction of cutting pressure may be said to be directly toward the lower corner of the can so that its displacement is entirely impossible. Moreover, at this time the handle portion of the operating lever is down in a horizontal plane and the operator is able to apply the greatest amount of pressure at the time most needed for cutting through the seam.

The cutter element provides cutting edges extending away from the point thereof and proceeding along the side edges of the element almost back to the point of attachment. As illustrated in Figure 5, these cutting edges are effective for producing a slicing action in the final phase of the opening operation, that is to say, they tend to slice down the side wall of the can toward the lowermost corner thereof ultimately across the seam. The can at this time is wedged firmly into position on its support element.

As the cutting operation is in its final stages, the leverage becomes greater since the cut is taking place closer to the center of rotation (see Figure 5). Therefore severance of the seam is easier.

Having described my invention, I claim:

1. A dispenser for oil or the like, comprising, a

receptacle, a support in the upper end of the receptacle incorporating supporting surfaces for mounting a sealed can in inclined position, and a knife operable in the dispenser for cutting across the lowermost portion of the can including the bottom and a side surface thereof and a portion of the seam.

2. A device for dispensing the contents of sealed cans of liquid, comprising, a receptacle having an outlet at its bottom, a support located at the upper end of the receptacle for mounting a sealed can in tilted position with respect to the bottom of the receptacle, a knife mounted adjacent to the support, and lever means for operating said knife for cutting out the lowermost corner of the can.

3. A dispenser for liquids, comprising, a receptacle, means for emptying said receptacle, a can opening device disposed at the upper end of the receptacle including a knife, and a can support for mounting the can adjacent to said knife in position wherein the knife cuts through a corner of the can for permitting flow of the contents of the can into the receptacle.

4. A can opening and liquid dispensing device, comprising, a receptacle including a can supporting fixture therein, and a rotary knife mounted on the fixture and including operating means for swinging this knife through the lowermost portion of the supported can.

5. A dispenser for liquids, comprising, a receptacle, means for emptying said receptacle, a can opening device disposed at the upper end of the receptacle including a knife, a can support for mounting a can in position whereby the knife cuts through a corner of the can for permitting flow of the contents of the can into the receptacle, and stop means for limiting cutting movement of the knife whereby it does not cut entirely through the seam.

6. A dispenser for receiving and delivering the contents of a can of oil or the like, comprising, a receptacle including a can opening fixture mounted within the upper end thereof and adapted to receive the can to be opened, and lever means for actuating the opening fixture for cutting the seam of the can, said means acting to force the can downwardly against said fixture.

7. A dispenser for receiving and delivering the contents of a can of oil or the like, comprising, a receptacle, a can support disposed within the upper end of the receptacle, a cutter knife disposed in position for rotation across the plane of the support, and said support providing angularly related surfaces for supporting the can in tilted position, whereby the cutter knife cuts through a corner of the can at the lowest point thereof when swung across the plane of the support.

8. A device of the class described, comprising, a support for a can to be opened including a delivery means and angular surfaces for mounting the can in tilted position, a rotary knife mounted in relation to said angular surfaces and crossing the space within the angles defined by the angular surfaces when manipulated for opening the can, and means for rotating the knife for this purpose.

9. A device of the class described, comprising, a support for a can to be opened including a delivery means and angular surfaces for mounting said can in tilted position, a rotary knife mounted in relation to said angular surfaces and adapted to cross the space within the angles defined by the angular surfaces when manipulated for opening the can, means for rotating the knife for this purpose, said knife being of hook form providing a point and cutting edges, and a mounting for said knife, disposing the same relative to the angular surfaces so that the edges of the knife as they approach the farthest angular surface are moving down the latter surface toward the seam of the can, thus tending to hold the can firmly against the angular surfaces.

10. A device of the class described, comprising, a support for a can to be opened including a delivery means, said support including spaced elements, each of said elements including angularly related edges for supporting a can to be opened in tilted position, a rotary knife mounted for rotation between said elements adapted to traverse the space defined by the angular edges, and means for rotating said knife and causing it to cut through a can supported on and between said elements.

11. A device of the class described, comprising, a liquid dispensing means including a receptacle, a can support disposed in said receptacle providing supporting surfaces disposed at right angles to each other, the angularly related surfaces tipped back from a horizontal plane and including a notch at their intersection for receiving the bead at the end of a can mounted on said surfaces, and a rotary knife adapted to enter the bottom of the can and traverse the lowermost corner of the can for cutting through the side wall and the seam thereof.

12. A device of the class described, comprising, a liquid dispensing means including a receptacle, a can support disposed in said receptacle providing spaced supporting arms including supporting surfaces disposed at right angles to each other, the angularly related surfaces of each arm tipped back from a horizontal plane and including notches at their intersections for receiving the bead at the end of a can mounted on said surfaces, and a rotary knife between the arms adapted to enter the bottom of the can and traverse the lowermost corner of the can for cutting through the side wall and the seam thereof, one of said notches including a stop for the knife, the bead of the can adapted to lie against the stop, and the other of said notches being of lesser depth than the first, whereby the knife severs the seam as it passes the bottom of the last mentioned slot but does not sever the seam as it engages the seam against the stop.

13. A cradle for supporting a can in a stable upright slanting position, adapting a cutting tool in a single cutting stroke to bias a corner of the can and puncturing adjoining walls thereof in converging directions to meet at the joining seam of the walls and to provide an opening for draining all of the contents of the can by gravity while sustained in the cradle, and a movable cutter mounted for movement relative to the cradle for penetrating the walls of the can to bias a corner in a line diametric of the can.

14. A liquid dispensing device comprising in combination, a holder adapted to receive a sealed receptacle containing a liquid to be dispensed, an opening lever, and puncturing means carried by said lever and insertable into and through the receptacle confined in said holder for forming an opening in an end of the receptacle to permit dispensing of its liquid contents and for also cutting through a side wall of the receptacle to mutilate and prevent its re-use.

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