

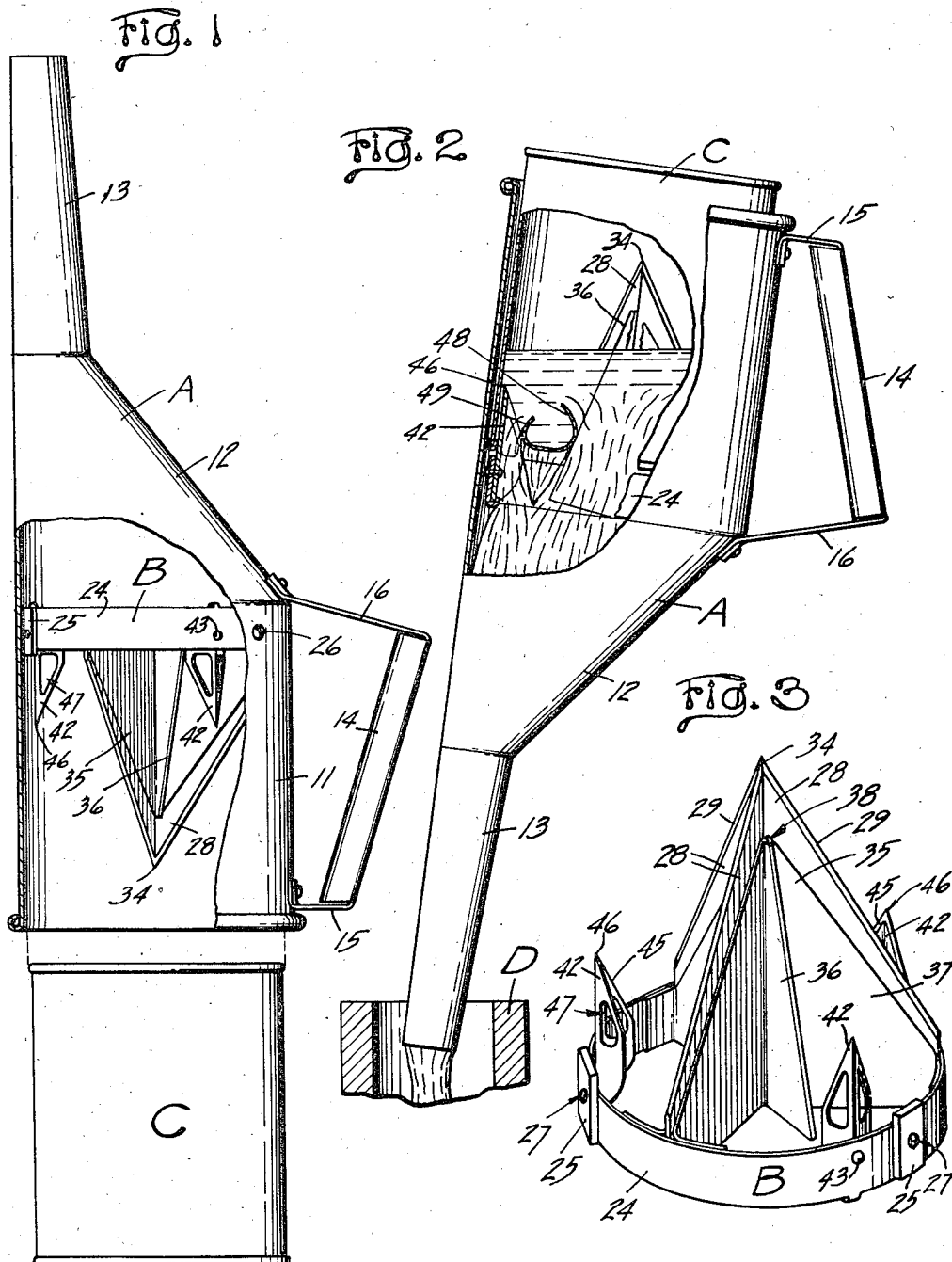
Feb. 4, 1936.

E. L. NALL

2,029,334

LIQUID DISPENSING DEVICE

Filed July 20, 1933



INVENTOR
Oliver L. Hall
BY *Dray R. Thornburgh*
Charles H. Cope
ATTORNEYS

UNITED STATES PATENT OFFICE

2,029,334

LIQUID DISPENSING DEVICE

Elmer L. Nall, Wheaton, Ill.

Application July 20, 1933, Serial No. 681,354

3 Claims. (Cl. 221-23)

The present invention relates to liquid dispensing funnels and has particular reference to funnels equipped with opening elements which function to cut into and practically cut open all of the top end of sealed liquid containing receptacles while being moved downwardly over the receptacle as a step in bringing funnel and receptacle together for dispensing of the liquid.

An object of the invention is the provision of a receptacle opening device arranged inside of a liquid dispensing funnel having a receptacle chamber, which surrounds a sealed receptacle as the funnel is positioned thereover and moved downwardly to carry the opening device first against the top wall of the receptacle and then to cut open the receptacle wall at a plurality of points, certain parts of the cut wall being turned back to further enlarge the openings, all these things being done while the funnel is being positioned over the receptacle, the opening device then holding the receptacle in the funnel as the latter is reversed to funnel position to discharge the liquid contents of the receptacle through the funnel.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawing, discloses a preferred embodiment thereof.

Referring to the drawing:

Figure 1 is a side elevation partly broken away and partly shown in section of a funnel containing a receptacle opening device, the view illustrating a sealed receptacle in alignment with the mouth of the funnel preparatory to bringing funnel and receptacle together into receptacle opening position;

Fig. 2 is a view similar to Fig. 1 illustrating the receptacle held by the cutter within the funnel and both in inverted position with the liquid contents of the receptacle discharging into and thence through the funnel and into a suitable place of deposit; and

Fig. 3 is a perspective view of the opening cutter.

The drawing discloses a preferred embodiment of the invention as it is adapted to dispensing lubricating oil, such as is used in automobiles and in such embodiment there are broadly three main elements. The first is a funnel A in which is located the second element, a cutter or opening device B, for cutting through a wall of a sealed liquid containing receptacle C, the third element. In Fig. 2 the funnel A is disclosed as

discharging liquid into a suitable place of deposit D which may be the oil receiving neck of a crank case of an automobile.

The funnel A may comprise a cylindrical body 11 connected by a tapered middle section 12 to a discharge spout 13 at its end. The body 11 encloses a chamber in which the cutter B is located and in this chamber the receptacle C is also substantially enclosed for dispensing of its contents. A handle 14 is shown as being 10 connected by a short strap 15 and a longer strap 16 to the funnel body and this provides a convenient means for holding it.

The cutter B may partake of any suitable form provided it quickly produces the necessary openings for the discharge of the oil. A form which has been found entirely satisfactory is shown in detail in Fig. 3. This same cutter is described in fullest detail in my pending application filed in the United States Patent Office July 30, 1932, 20 under Serial No. 626,565. Only its principal features will be noted in this instant description.

This cutter comprises generally a frame or supporting band 24 having an outer diameter substantially less than the inner diameter of the funnel body 11 and less than the outer diameter of the container C to be opened. Rectangular spacer blocks 25 are secured to the outer wall of the band 24 and project slightly above the upper edge of the band when the cutter is in the position illustrated in Fig. 3.

The cutter B is rigidly held in the funnel chamber by screws 26 (Fig. 1) which pass through the funnel body and threadedly engage in screw holes 27 extending through both the spacer blocks 25 and through the band 24. In this held position of the cutter the spacer blocks 25 engage the inside wall of the funnel body 11 and hold the band away a distance equal to the thickness of the spacer blocks. This allows for venting as will be more fully pointed out.

Three cutting knives or blades 28 constitute the initial cutting elements and these are radially arranged inside of the band 24. The upper outer edge of each blade is sharpened or beveled at 29 to provide a cutting edge and the three cutting edges terminate in an apex or piercing point 34. It is this point which first engages the end wall of the receptacle C when the funnel A is brought down over it.

Supporting web members 35 hold the blades 28 in place and are located inside of and are secured to the band 24. Each member 35 is bent back on itself to provide a double walled, outwardly tapered and radial deflecting part 36, the ends of

each member being formed in side wings 37 which are located in engagement with adjacent cutting blades 28. This construction provides a solid support for the blades.

5 Vent passages 32 (Fig. 3) pass vertically inside of the folded members 35 and alongside of the abutting edges of adjacent cutting blades 28 and these vents allow air to pass into the receptacle C after the members 35 have been introduced 10 through its cut end wall.

The cutter B is also provided with a series of relatively short triangular shaped puncturing elements or spears 42. These spears are secured to the band 24 in any suitable manner as by 15 rivets 43. Each spear 42 is preferably located directly opposite each deflecting member 36.

Each spear 42 is bent along a central vertical line and presents two flared right angle wings which are sharpened at the top into cutting edges 20 45 which terminate in a piercing point 46. A draining aperture 47 is also cut in each side wing.

The open end of the funnel is moved downwardly over the top end of the receptacle C as the first step in using the funnel. The apex 34 25 of the cutting blades 28 first comes into engagement with the top wall of the receptacle. The cutting blades 28 pierce through the top wall and move downwardly into the receptacle as they cut radial slits in the top wall.

30 Further downward movement brings the adjacent end of the deflecting members 36 against the material of the top wall of the receptacle between these slits and the inclined ridges of the members 36 move into contact with the intervening uncut wall portions between the slits and 35 press against and bend or curl the wall parts inwardly at 48 (Fig. 2), thereby enlarging the openings made by the cutting blades.

Still further downward movement next brings 40 the points 46 of the spears 42 against and then through the cut wall of the receptacle and the side wings of the spears fold back or curl the adjacent wall parts at 49 (Fig. 2) enlarging the openings made by the members 42. This curling 45 back of the metal at 48 and 49 opens a substantial area in the wall of the receptacle.

The funnel A is moved downwardly until the projecting ends of the spacer blocks 25 strike 50 against the upper edge or rim of the receptacle C. It cannot then be moved further over the receptacle but in such position the receptacle wall is so impaled upon the cutting elements of the cutter B that it is held in this position.

55 This permits inverting of the funnel and the held receptacle into the dispensing position illustrated in Fig. 2 where the funnel spout 13 is inserted into the opening in the neck part D, from which position the contents of the receptacle C cascade and rapidly drain through the openings 60 in its punctured wall. During all of this dispensing period the receptacle is supported in the funnel with its end against the spacer blocks 25.

By the use of such an opening device B secured within a chamber within a funnel A it will be 65 observed that it is only necessary to move the funnel downwardly over the receptacle to effect complete opening of the latter and thence by using the funnel in the regular way, with its contained receptacle in place, the liquid content

rapidly flows through the cut openings, air passing upwardly through the vent channels 38 in the cutter and around the wall of the receptacle and through the openings cut in the receptacle wall. The uncut wall parts having been bent 5 back and out of the way there is an unrestricted passage for the liquid.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent 10 that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being 15 merely a preferred embodiment thereof.

I claim:

1. A liquid dispensing device, comprising in combination, a dispensing funnel adapted to move 20 downwardly over and substantially enclose a sealed receptacle containing a liquid to be dispensed, and a cutter secured inside of said funnel and having cutting elements for cutting open the top end wall of the receptacle when said cutter 25 and its funnel are forced down into and over said receptacle, said cutting elements tapering inwardly and upwardly from the side wall of said funnel into a common piercing apex disposed substantially centrally of the funnel, the liquid contents of said receptacle flowing through the opening 30 so formed and into the said funnel when the latter is inverted.

2. A liquid dispensing device, comprising in combination, a dispensing funnel adapted to move 35 downwardly over and hold a sealed receptacle containing a liquid to be dispensed and also adapted to receive said liquid from said receptacle after the latter has been opened and both receptacle and funnel have been inverted, and a cutter secured inside of said funnel and having a plurality 40 of cutting elements for cutting into the top end wall of said receptacle during the movement of said funnel thereover, some of said cutting elements having air vents for introducing 45 air into said opened receptacle to assist in the discharge of said liquid from the receptacle into said funnel.

3. A liquid dispensing device, comprising in combination, a dispensing funnel adapted to move 50 downwardly over and substantially enclose a sealed receptacle containing a liquid to be dispensed and also adapted to receive said liquid from said receptacle and discharge it after the receptacle has been opened and both receptacle 55 and funnel inverted, a cutter frame disposed inside of said funnel and having a plurality of cutting elements extending from said frame to a central cutting apex and adapted for cutting open the top end wall of said receptacle when said 60 funnel is moved into position and when the cutting elements are forced down into said receptacle wall, and outwardly inclined deflecting means arranged between said cutting elements for enlarging and clearing the openings formed by the latter so that unrestricted dispensing takes place 65 when receptacle and funnel are inverted and while said liquid is flowing through said funnel.

ELMER L. NALL.