

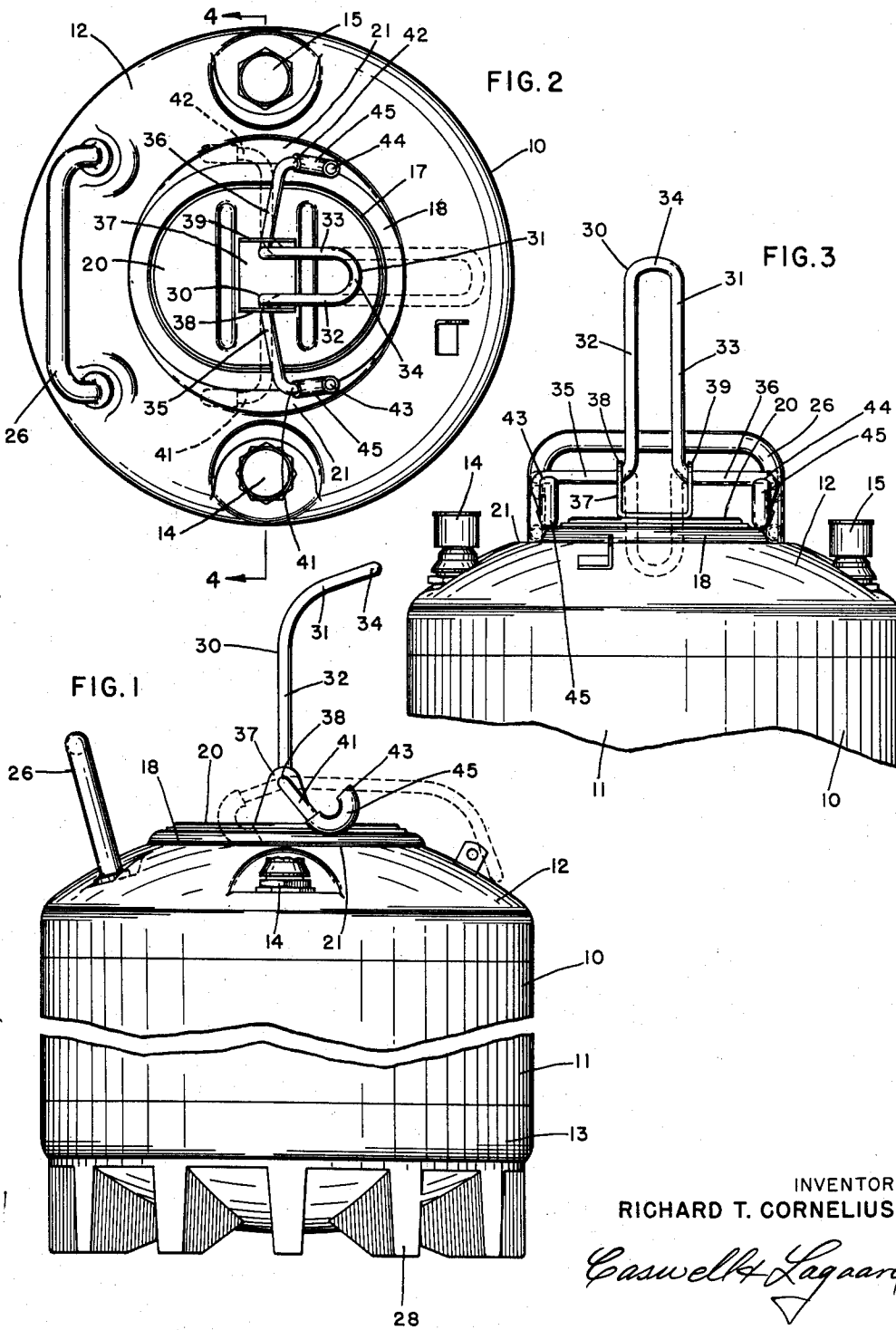
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R. T. CORNELIUS
CLOSURE OPERATOR

3,076,576

Filed July 17, 1959

2 Sheets-Sheet 1



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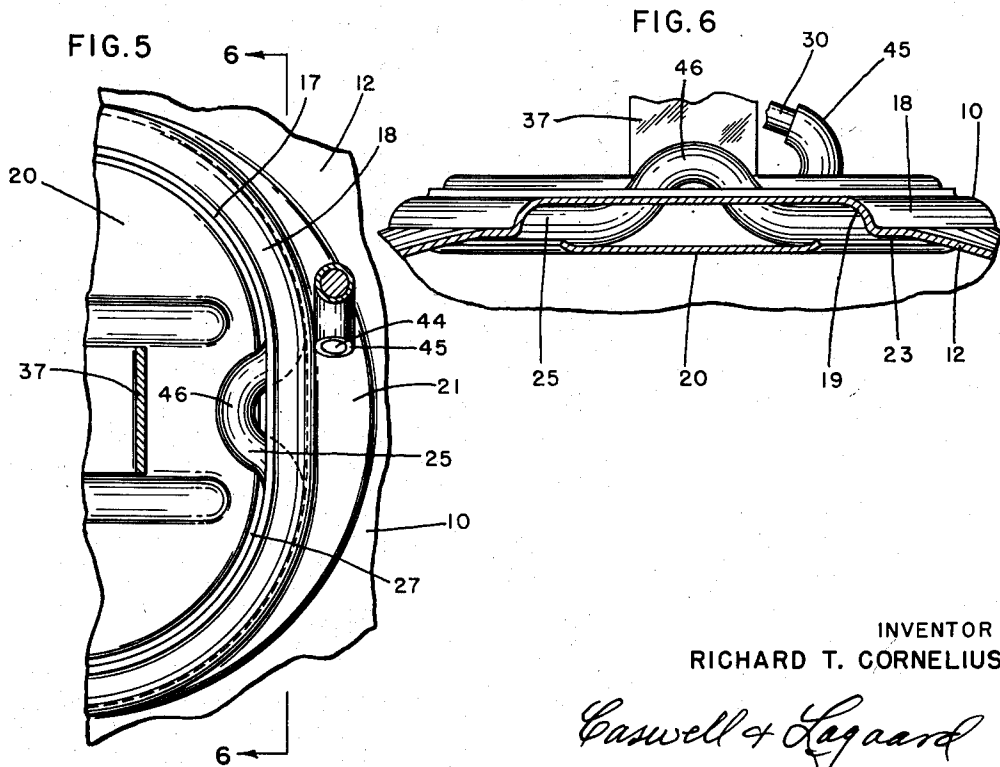
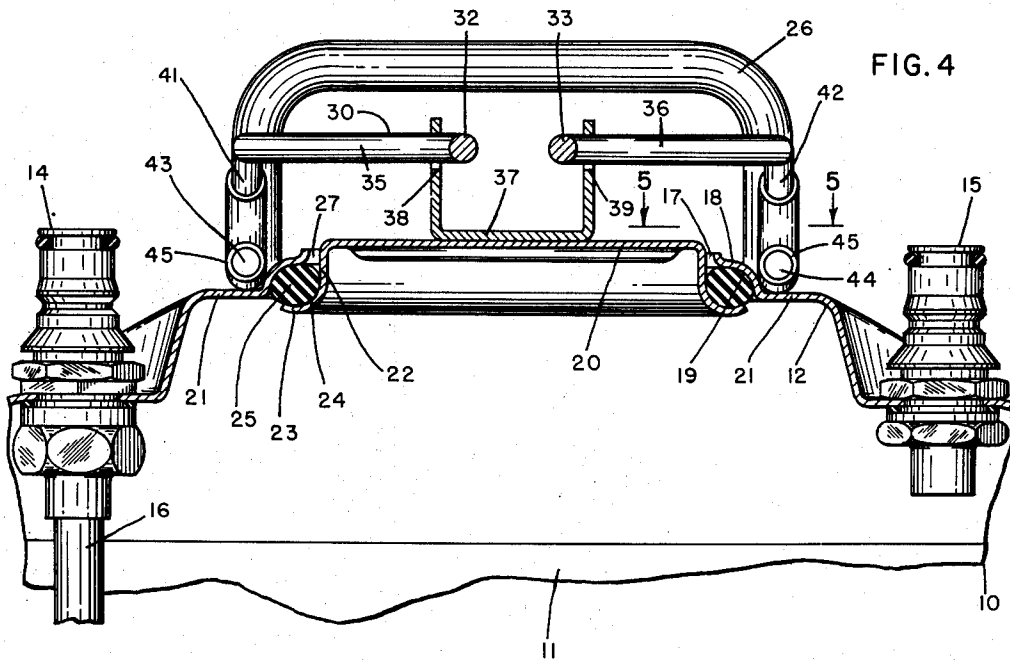
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CLOSURE OPERATOR

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The herein disclosed invention relates to closures for cans and has for an object to provide a closure which will be extremely simple to operate and which will effect a tight seal between the can and cover.

An object of the invention resides in providing a closure operator particularly designed for use with a can having a top formed with an elongated opening therein and through which an elongated cover may be inserted and movable outwardly into closing position with the internal marginal portion of the can at said opening.

A still further object of the invention resides in providing a closure operator constructed entirely of resilient wire.

A feature of the invention resides in providing a closure operator having an elongated handle with arms extending normally outwardly from one end of said handle and in opposite directions and providing pivot means carried by the cover for engaging said arms near said handle.

A still further object of the invention resides in providing cams carried by the outer ends of said arms and engageable with the outer surface of the marginal portion of the top of the can adjacent said opening and movable in a direction urging the cover into closing position.

Another object of the invention resides in constructing the cams with plastic shoes engaging the can and serving to reduce the friction between the cams and the top of the can.

A still further object of the invention resides in arranging the arms normally in a plane and forming an obtuse angle with one another and in constructing the angle such that the arms become substantially in alignment when the closure is in closing position.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

FIG. 1 is a side elevational view of a can illustrating an embodiment of the invention applied thereto.

FIG. 2 is a plan view of the structure shown in FIG. 1.

FIG. 3 is a front elevational view of the structure shown in FIG. 1.

FIG. 4 is a fragmentary elevational sectional view taken on line 4-4 of FIG. 2 and drawn to a greater scale.

FIG. 5 is a fragmentary plan sectional view taken on line 5-5 of FIG. 4 with the gasket blown out and drawn to the same scale as FIG. 4.

FIG. 6 is a fragmentary elevational sectional view taken on line 6-6 of FIG. 5.

For the purpose of illustrating the invention, an ordinary can 10 has been shown having a body 11 cylindrical in form and provided with a top 12 and a bottom 13 secured thereto. Both the top 12 and the bottom 13 are dome-shaped in form to resist pressure applied to the interior of the can. A base 28 is secured to the bottom 13. Two fittings 14 and 15 are attached to the top 12, the fitting 14 having a tube 16 connected to the same and leading to the bottom of the can and the fitting 15 being in communication with the upper portion of the can. Both fittings 14 and 15 may, if desired, be of the self-closing type which become opened when a connector of suitable construction is applied to the same and which automatically close when the connector is removed.

The top 12 of the can is provided with a planiform portion 21 having an elliptical shaped opening 17 in the

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same, said opening being longer than its width and which is surrounded by a rim 18. This rim extends above the planiform portion 21 of the cover and has a groove 19 formed in the underside of the same arcuate in cross section and facing inwardly into the can. The cover 12 is further provided with a handle 26 and by means of which the entire can may be carried about.

For closing the opening 17, a cover 20 is employed, which is elliptical in shape to conform to the shape of the opening 17 and which has a depending skirt 22 extending about the same. This skirt is freely received in the opening 17. The lower end of this skirt is formed with an outwardly extending flange 23 which has a groove 24 extending about the same which is arcuate in cross section. This groove faces the groove 19 and provides a space therebetween in which is received an O-ring 25. The depth of the cover 20 is considerably less than the width of the opening 17 so that the cover may be inserted endwise through said opening along the plane containing the major axis of the same and brought into the interior of the receptacle. Upon rotating the cover after the same is within the receptacle, the cover may be moved into register with said opening and the O-ring 25 which is normally mounted on the cover brought into engagement with the rim 18 of top 12 at the groove 19.

For clamping the cover 20 in position, a closure operator 30 is employed, which is constructed from resilient wire and which is best shown in FIGS. 1, 2 and 3. This operator comprises an elongated handle 31 U-shaped in form and having spaced legs 32 and 33 connected together by means of a looped connecting portion 34. The outer ends of said legs have issuing outwardly therefrom arms 35 and 36 which are disposed in coplanar relation and normally form with each other an obtuse angle as best shown in FIGS. 2 and 3. The top of the cover 20 has attached to it a U-shaped bracket 37 providing two bearings 38 and 39 for the arms 36 and which are closely positioned to the legs 32 and 33 of handle 20. The ends of the arms 35 and 36 have formed on them fingers 41 and 42 which extend angularly therefrom and terminate in curved cams 43 and 44. Sleeves 45, constructed of nylon or some other similar plastic material, encircle the cams 43 and 44 and serve as shoes for engagement with the planiform portion 21 of top 12. The fingers 41 and 42 are of such a length and the cams 43 and 44 are of such shape that the shoes 45 clear the planiform portion 21 of the top 12 when the cover 31 is in position.

The method of using the invention is as follows: The liquid contained within the can may be inserted through the opening 17 before the application of the cover 20 thereto. After the required amount of liquid has been inserted, the cover is grasped by the handle 31 and the cover inserted endwise into the opening 17 and brought into the interior of the can. The cover is then rotated and with the handle still disposed outwardly of the can the cams 43 and 44 are brought over the planiform portion 21 of the top 12. The arrangement of the parts when in such position is shown in full lines in FIGS. 1, 2 and 3. Thereafter, the handle 31 may be swung downwardly to the dotted position shown in FIGS. 1, 2 and 3 causing the shoes 45, forming part of the cams 43 and 44, to slide along the surface of the planiform portion 21 of top 12. During such movement, the arms 35 and 36 are sprung until the same are substantially in alignment as shown in dotted lines in FIG. 2. This draws the cover upwardly and compresses the O-ring 25 between the rim 18 and the flange 23 causing the ring to lie within the grooves 19 and 24 and to firmly engage said rim and flange. The shoes 45 on the cams 43 and 44 cause the cams to slide freely along the surface of the planiform portion 21 and prevent scoring of the parts while the closure operator is being operated. After the cover has

been applied, air or other gas under pressure is introduced into the can through the fitting 15 which is removed after the pressure reaches the desired value. By attaching a suitable conduit to the fitting 14, the liquid may be dispensed as required.

The O-ring 25 is also used as a safety device for relieving the pressure in the tank when the pressure becomes too great. For this purpose the skirt 22 is made considerably smaller in dimensions than the opening 17 to leave a groove 27 therebetween. When the pressure becomes excessive, a portion 46 of the O-ring 25 in the form of a loop blows out through the groove 27 relieving the pressure in the can.

The advantages of the invention are manifest. The construction is extremely simple and readily lends itself to cleaning. The operator is constructed entirely of wire and can be formed at a nominal expense. The operator serves both as a handle for manipulating the cover and for clamping the cover in position.

Changes in the specific form of the invention, as herein described, may be made within the scope of what is claimed without departing from the spirit of the invention.

Having described the invention, what is claimed as new and desired to be protected by Letters Patent is:

1. A closure operator for moving outwardly into closing position the internal cover of a can having a top formed with an elongated opening therein, and through which the cover is insertable into the interior of the can, said closure operator being constructed of resilient material and comprising an elongated handle, arms extending normally outwardly from one end of said handle and in opposite directions and in angular relationship relative to one another, pivot means carried by said cover and engaging said arms near said handle, cams carried by said arms at the outer free ends thereof and engageable with the top of the can, each of said cams causing the outer end of the arm by which it is carried to move into alignment with the other arm to force said cover outwardly and to urge it into closing position.

2. A closure operator for moving outwardly into closing position the internal cover of a can having a top formed with an elongated opening therein, and through which the cover is insertable into the interior of the can, said closure operator being constructed of resilient wire having an elongated U-shaped handle with spaced legs and a connecting portion between said legs at one end of each thereof, arms issuing outwardly from said legs at the other ends thereof and disposed in coplanar relation and normally forming with each other an obtuse angle, bearings for said arms carried by said cover and engaging said arms near said handle, cams carried by said arms at the outer ends thereof and engageable with the top of the can, each of said cams causing the outer end of the arm by which it is carried to move into alignment with the other arm and said bearings accommodating such movement to create torque in said legs causing said cams to yieldingly engage the top of the can to force said cover outwardly and to urge it into closing position.

3. A closure operator for moving outwardly into closing position the internal cover of a can having a top

formed with an elongated opening therein and through which the cover is insertable into the interior of the can, said closure operator being constructed of resilient wire having an elongated handle, arms extending normally outwardly from one end of said handle and in opposite directions, and forming an angle with one another, pivot means carried by said cover and engaging said arms near said handle, cams carried by said arms at the outer ends thereof and spaced from said pivot means, said cams being engageable with the top of the can, and causing the arms to move in a manner to alter the angle thereof to force the cover in an outward direction, and resilient means resisting such movement.

4. A closure operator for moving outwardly into closing position the internal cover of a can having a top formed with an elongated opening therein and through which the cover is insertable into the interior of the can, said closure operator comprising two juxtaposed elongated resilient rods extending generally in the same direction, means rigidly connecting said rods together at their outer ends thereof, arms extending angularly outwardly from the inner ends thereof and in opposite directions, portions of said arms at the locality of issuance thereof from said rods serving as journals, bearings therefor carried by said cover and journalling each of said arms for rotating movement about the axis thereof and for swinging movement about the axis of the rod from which it issues, said rods lying between said bearings, cams on the outer ends of said arms and disposed outwardly of said bearings and spaced therefrom, said cams engaging parts fixed relative to said can to vary the angularity between the axes of said arms when the cams are urged into engagement with said can to create torque in said rods to yieldingly urge the cover into closing position.

5. A closure operator for moving outwardly into closing position the internal cover of a can having a top formed with an elongated opening therein and through which the cover is insertable into the interior of the can, said closure operator comprising an elongated slender resilient rod serving as a handle, an arm extending angularly outwardly from the inner end thereof, said arm at the locality of issuance from said rod serving as a journal, pivot means carried by said cover and journalling said journal for rotation about the axis of said arm and said arm for movement about the axis of said resilient slender rod, a cam on the outer end of said rod and engaging said can and means engaging the outer end of said rod and said can and resisting rotation of said rod to set up therein a torque yieldingly urging said cover into closing position when the cam is moved along the can.

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