July 30, 1963 L. G. CALLEGARI 3,099,363

SPRING CAN SEALER

Filed Aug. 16, 1962

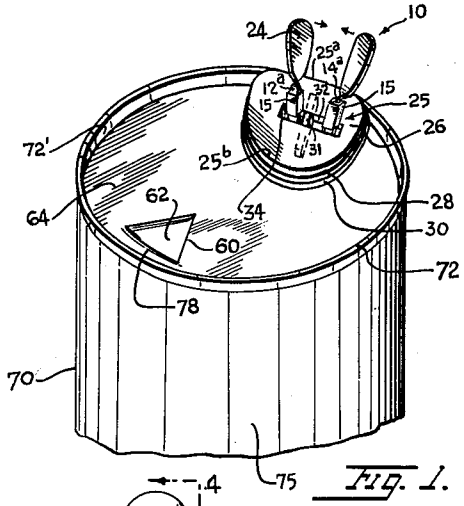


Fig. 1.

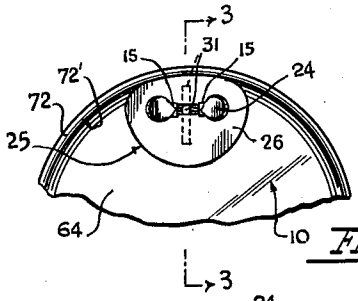


Fig. 2.

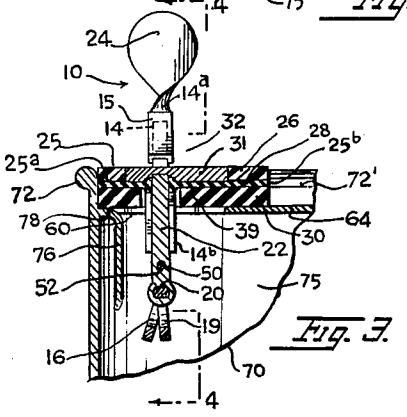


Fig. 3.

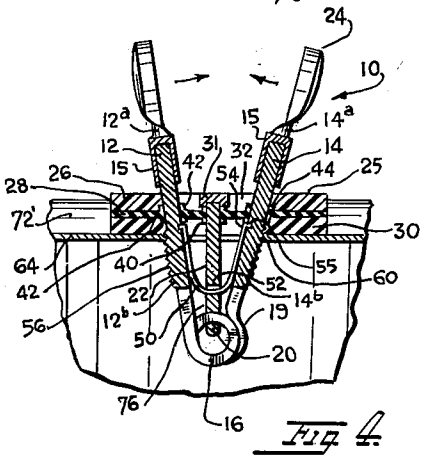


Fig. 4.

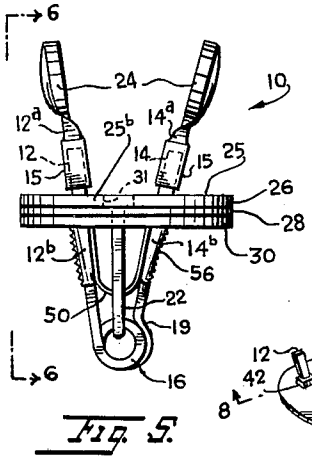


Fig. 5.

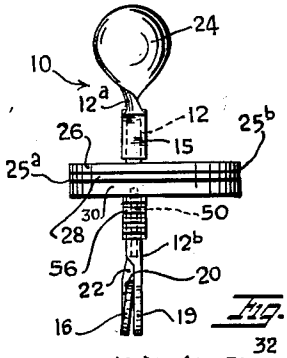


Fig. 6.

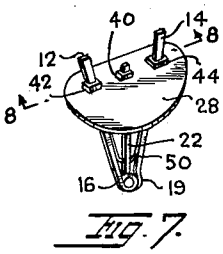


Fig. 7.

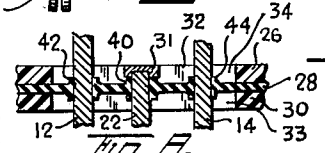


Fig. 8.

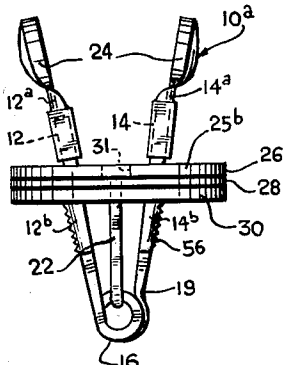


Fig. 9.

INVENTOR.
LOUIS G. CALLEGARI
BY Zoltan Holeschek
ATTORNEY

United States Patent Office

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SPRING CAN SEALER

Louis G. Callegari, 34—06 45th St.,
Long Island City, N.Y.

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The present invention relates geneally to closure devices and more particularly to a novel re-usable closure device for sealing a generally triangular aperture formed in the top of a can.

The closure device is especially adapted for use in sealing the generally triangular aperture or opening formed in a can by a metal can opener having a tapered, bent prong. This type of can opener punches a generally triangular opening by cutting away a portion of the top of the can and turning this cut-away portion downwardly into the can so that the opening functions for pouring liquid from the can when the can is held in pouring position.

Since the opening produced by such a can opener has a smooth rolled-down edge and two angularly disposed raw edges, it is difficult to close with conventional can sealing devices. Frequently it is desired to use only a portion of the contents of a can at any one time. The remainder of the contents, which may be a beverage such as beer, carbonated soft drink, fruit juice and the like, must be kept under hermetic pressure seal to protect the remainder of the contents from spoilage.

It is a principal object of the invention to provide a reuseable closure device which is retained in an opening in a can under spring tension, to resist gas pressure inside the can.

A further object is to provide a removable and reusable closure for an irregularly shaped opening in the top of a can.

Another object is to provide a can closure device which engages edges of an opening in the can under spring tension to hold the closure in hermetic sealing engagement over the opening.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIG. 1 is a perspective view of a closure device shown mounted on the top of a can and closing an opening therein.

FIG. 2 is a top plan view on a reduced scale of the closure device and part of the can, of FIG. 1.

FIG. 3 is a sectional view on an enlarged scale taken on line 3—3 of FIG. 2.

FIG. 4 is a sectional view taken on line 4—4 of FIG. 3.

FIG. 5 is a side elevational view of the closure device per se.

FIG. 6 is another side elevational view of the closure device, taken 90° from the veiw of FIG. 5, as indicated by line 6—6 of FIG. 5.

FIG. 7 is a top perspective view of the diaphragm showing the manipulative arms extending therethrough.

FIG. 8 is a vertical sectional view through the body of the sealing device.

FIG. 9 is a view similar to FIG. 6 showing another form of the invention.

Referring to the drawings, there is shown in FIGS. 1–6, a closure device **10** including a pair of coplanar straight flat sectional arms **12**, **14**, including upper sections **12***a* and **14***a* and lower sections **12***b* and **14***b*. The bottom ends of the upper sections are formed with enlarged sockets **15** frictionally receiving the top ends of bottom sections **12***b* and **14***b*. The arms are integrally secured at their

lower ends to upper ends of a coil spring **16**. The spring coil is turned counterclockwise as viewed in FIGS. 4 and 5. The inner turn **19** of the coil is engaged in a notch **20** formed in the lower end of a bar **22**. The upper sections **14***a* of the upper ends of the arms are formed with enlarged flat, opposing heads **24** which facilitate manipulation of the device.

The device includes a flat body **25** including an upper rigid plastic plate **26**. Secured to the underside of plate **26** is an elastic diaphragm **28**, and secured to the underside of diaphragm **28** is a resilient pad **30**. The pad and diaphragm may be made of natural or artificial rubber or plastic. The plate **26** has an elongated rectangular shaped closed opening **34** at the center thereof. Pad **30** has a central hole **33** which registers with but is closed off from the opening **34** in plate **26** by the diaphragm **28**. Bar **22** passes through and has a force fit in a central sleeved hole **40** in the diaphragm. At its top, the bar is formed wth a cross piece **31** extending across the opening **34** in plate **26** with its ends embedded in the material of the plate. The lower sections **12***b* and **14***b* of arms **12**, **14** pass through and have a force fit in sleeved holes **42** and **44** spaced from the central hole **40**. In addition to having a force fit through the sleeved holes, the lower sections might be sealed therein by cement or adhesive. The arms **12** and **14** are held in a plane perpendicular to the plane of body **25**.

The coil spring **16** biases the arms **12**, **14** apart so that they normally assume the divergent position shown in the drawing. The arms can be pressed inwardly toward each other against the outward bias in spring **16**. When this is done, the diaphragm **28** yields elastically keeping the holes **40**, **42**, **44**, sealed as the arms move as indicated by arrows A in FIG. 4. A U-shaped spring **50** may be provided to supplement the spring **16**. Spring **50** has its bight passing through a hole **52** formed in bar **22**. Free ends **54** of the spring **50** are engaged in recesses **55** formed in opposing inner sides of the arms **12**, **14**.

On outer side of the lower sections **14***b* of arms **12**, **14** there are formed serrations or teeth **56**. These teeth engage the raw opposing edges **60** of a triangular opening **62** formed in the circular top **64** of the can **70**. Can **70** as shown in FIGS. 1–4 has a circumferential annular bead **72** at the upper end of its cylindrical wall **75**. When the opening **62** is formed by a can opener a triangular portion **76** is cut from the top and bent downwardly into the can leaving a circumferential ledge **78** and two angularly disposed raw edges **60**. The resilient pad **30** is pressed into the triangular opening sealing the same. The serrated outer sides of the arms **12**, **14** are held in engagement with edges **60** of the hole **62** by the cooperating springs **16** and **50** which bias the arms apart. The can remains sealed and resists displacement even though there may be considerable gas pressure in the can tending to push the closure device outwardly of the opening.

The body **25** has a rear or outer edge **25***a* which has a circular curvature to correspond to the internal curvature of annular bead **72**. The body **25** has a front or inner edge **25***b* which is circularly curved with a smaller radius of curvature than that of edge **25***a*. The maximum diameter of body **25** is longer than the maximum dimension of opening **62** so that the body **25** effectively closes the opening and overlaps the top of the can all around the opening. The abutment of the edge **25***a* to the inner side **72'** of bead **72** serves to prevent radial displacement of the device on the can and the engagement of the arms **12**, **14** with the edges of the opening prevent circumferential displacement of the device. The extension of pad **30** into the opening insures a hermetic seal which is maintained by the sleeves around at the openings **40**, **42** and **44**.

The closure device is easily removed from the can by

manually pressing the heads 24 toward each other to disengage the serrated outer sides of the arms from the edges 60 of the can opening 62.

If desired the spring 50 may be omitted as shown in closure device 10*a* in FIG. 9. Closure device 10*a* is substantially the same as device 10 and corresponding parts are identically numbered.

The closure devices described make it possible to keep a beverage fresh and sparkling longer than is possible with other can sealers heretofore known. The devices are re-usable over and over. They are easily cleaned and can be economically manufactured by well known metal and plastic working machinery.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. A closure device for a generally triangular opening in a flat top of a can with an annular bead, comprising a flat body including an upper rigid layer, a lower resilient layer, and an elastic diaphragm disposed between the upper and lower layers, said layers having aligned openings therein separated by said diaphragm, and a spring having a pair of sectional arms extending through said openings in the layers and through spaced holes in said diaphragm, said arms being biased apart in divergent directions and movable toward each other against bias in said spring, said arms having serrations formed in outer sides for engaging opposing edges of said opening.

2. A closure device for a generally triangular opening in a flat top of a can with an annular bead, comprising a flat body including an upper rigid layer, a lower resilient layer, and an elastic diaphragm disposed between the upper and lower layers, said layers having aligned openings therein separated by said diaphragm, a coil spring having a pair of sectional arms extending through said openings in the layers and through spaced holes in said diaphragm, said arms being biased apart by the coil spring and movable toward each other against bias in said spring, and a bar secured at one end to said body and passing through said diaphragm, the coil of said spring being secured to the other end of said bar, said arms having serrations formed in outer sides thereof for engaging opposing edges of said opening, said diaphragm gripping the arms and bar under tension and elastically stretching when the arms are moved.

3. A closure device for a generally triangular opening in a flat top of a can with an annular bead, comprising a flat body including an upper rigid layer, a lower resilient layer, and an elastic diaphragm disposed between the upper and lower layers, said layers having aligned openings therein separated by said diaphragm, a coil spring having a pair of sectional arms extending through said openings in the layers and through spaced holes in said diaphragm, said arms being biased apart by the coil spring and movable toward each other against bias in said spring, a bar secured at one end to said body and passing through said diaphragm, the coil of said spring being secured to the other end of said bar, said arms having serrations formed in outer sides thereof for engaging opposing edges of said opening, said diaphragm gripping the arms and bar under tension and elastically stretching when the arms are moved, and a U-shaped spring having a bight engaged with said other end of the bar and having ends engaged with said arms to supplement the bias of the coil spring in urging the arms apart.

4. A closure for a generally triangular opening in a flat top of a can with an annular bead, comprising a flat body including an upper rigid layer, a lower resilient layer, and an elastic diaphragm disposed between the upper and lower layers, said layers having aligned openings therein-separated by said diaphragm, and a spring having a pair of sectional arms extending through said openings in the layers and through spaced holes in said diaphragm, said arms being biased apart in divergent directions and movable toward each other against bias in said spring, said arms having serrations formed in outer sides for engaging opposing edges of said opening, said body having an outer edge portion conforming in curvature with the curvature of the bead for abutting the bead when said body is seated on the top of the can over said opening, said body having a curved inner edge portion larger in maximum diameter than the maximum dimension of said opening, so that the body overlaps the top of the can at all edges of the opening while the resilient layer enters and is held within said opening.

5. A closure device for a generally triangular opening in a flat top of a can with an annular bead, comprising a flat body including an upper rigid layer, a lower resilient layer, and an elastic diaphragm disposed between the upper and lower layers, said layers having aligned openings therein separated by said diaphragm, a coil spring having a pair of sectional arms extending through said openings in the layers and through spaced holes in said diaphragm, said arms being biased apart by the coil spring and movable toward each other against bias in said spring, and a bar secured at one end to said body and passing through said diaphragm, the coil of said spring being secured to the other end of said bar, said arms having serrations formed in outer sides thereof for engaging opposing edges of said opening, said diaphragm gripping the arms and bar under tension and elastically stretching when the arms are moved, said body having an outer edge portion conforming in curvature with the curvature of the bead for abutting the bead when said body is seated on the top of the can over said opening, said body having a curved inner edge portion larger in maximum diameter than the maximum dimension of said opening, so that the body overlaps the top of the can at all edges of the opening while the resilient layer enters and is held within said opening.

6. A closure device for a generally triangular opening in a flat top of a can with an annular bead, comprising a flat body including an upper rigid layer, a lower resilient layer, and an elastic diaphragm disposed between the upper and lower layers, said layers having aligned openings therein separated by said diaphragm, a coil spring having a pair of sectional arms extending through said openings in the layers and through spaced sleeved holes in said diaphragm, said arms being biased apart by the coil spring and movable toward each other against bias in said spring, a bar secured at one end to said body and passing through said diaphragm, the coil of said spring being secured to the other end of said bar, said arms having serrations formed in outer sides thereof for engaging opposing edges of said opening, said diaphragm gripping the arms and bar under tensison and elastically stretching when the arms are moved, and a U-shaped spring having a bight engaged with said other end of the bar and having ends engaged with said arms to supplement the bias of the coil spring in urging the arms apart, said body having an outer edge portion conforming in curvature with the curvature of the bead for abutting the bead when said body is seated on the top of the can over said opening, said body having a curved inner edge portion larger in maximum diameter than the maximum dimension of said opening, so that the body overlaps the top of the can at all edges of the opening while the resilient layer enters and is held within said opening.

7. A closure device for a generally triangular opening formed in the top of a can having an annular bead, comprising a flat body having upper and lower layers and an elastic diaphragm secured between the layers, a pair of sectional arms secured together at one end and extending through aligned holes in said layers and diaphragm.

said diaphragm having sleeved around the holes through gripping the arms and elastically sealing the holes thereat, said diaphragm elastically yielding to permit movements of the arms toward and away from each other while pivoting at said one end, and spring means biasing the arms apart in normal divergent directions, said arms having outer serrated sides for gripping edges of said opening.

8. A closure device for a generally triangular opening formed in the top of a can having an annular bead, comprising a flat body having upper and lower layers and an elastic diaphragm secured between the layers, a pair of sectional arms secured together at one end and extending through aligned holes in said layers and diaphragm, said diaphragm having sleeves around the holes therein gripping the arms and elastically sealing the holes thereat, said diaphragm elastically yielding to permit movements of the arms toward and away from each other while pivoting at said one end, and spring means biasing the arms apart in normal divergent directions, said arms having outer serrated sides for gripping edges of said opening, said body having an outer edge conforming in curvature to the bead for abutting the bead when the body is seated on top of the can over said opening, said body being larger than said opening so that the body overlaps the top of the can at all edges of the opening.

9. A closure device for a generally triangular opening formed in the top of a can having an annular bead, comprising a flat body having upper and lower layers and an elastic diaphragm secured between the layers, a pair of sectional arms secured together at one end and extending through aligned holes in said layers and diaphragm, said diaphragm sleeves around the holes therein gripping the arms and elastically sealing the holes thereat, said

diaphragm elastically yielding to permit movements of the arms toward and away from each other while pivoting at said one end, spring means biasing the arms apart in normal divergent directions, said arms having outer serrated sides for gripping edges of said opening, said lower layer being resilient to enter the opening and to seal the edges thereof when the body is seated on the top of the can.

10. A closure device for a generally triangular opening formed in the top of a can having an annular bead, comprising a flat body having upper and lower layers and an elastic diaphragm secured between the layers, a pair of sectional arms secured together at one end and extending through aligned holes in said layers and diaphragm, said diaphragm having sleeves around the holes therein gripping the arms and elastically yielding to permit movements of the arms toward and away from each other while pivoting at said one end, spring means biasing the arms apart in normal divergent directions, said arms having outer serrated sides for gripping edges of said opening, said lower layer being resilient to enter the opening and to seal the edges thereof when the body is seated on the top of the can, said upper layer being a rigid plate, and connecting means engaged between said plate and said one end of the arms to secure the arms pivotally in a plane perpendicular to said plate.

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