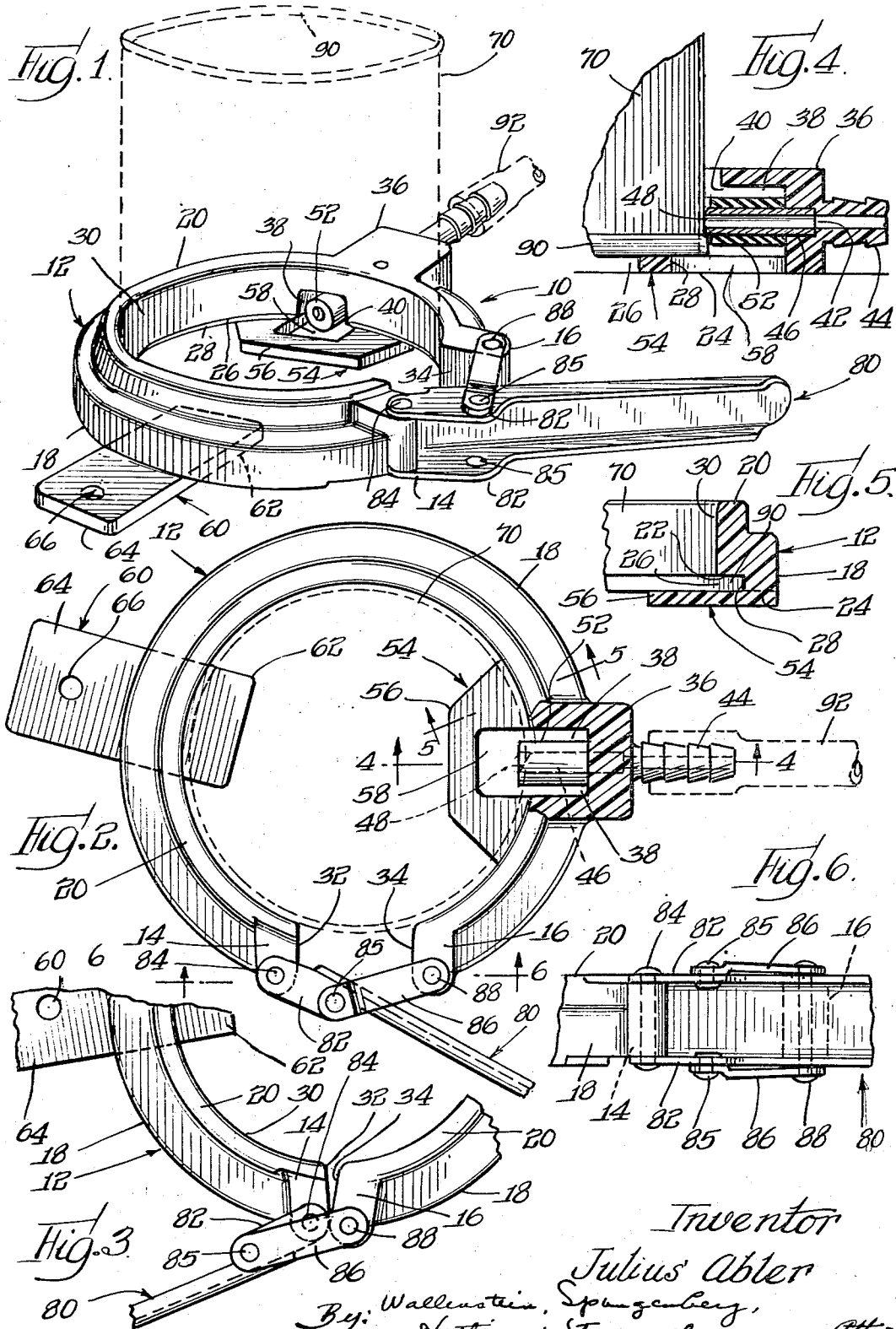


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 DEVICE FOR OPENING AND DISPENSING
 FLUID FROM A CONTAINER
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DEVICE FOR OPENING AND DISPENSING FLUID FROM A CONTAINER

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ABSTRACT OF THE DISCLOSURE

A fluid dispensing device of the type that is adapted to be clamped about the base of a cylindrical metal container of fluid whereby an opening is pierced in the vertical side wall of the container and the fluid is dispensed therefrom. The device comprises an integral, one-piece, substantially annular, molded, resilient plastic body member having an inner wall which provides a large, substantially continuous area of contact for engaging the vertical side wall of a cylindrical metal container. The inner wall, due to the resilient character of the plastic of the body member, is capable of resiliently conforming to the vertical side wall of the container when the body member is in a closed position thereby substantially preventing any buckling of the vertical side wall of the container which may cause rupturing at the seams thereof with the result that fluid in the container will be wasted.

Fluid dispensing devices of the type here under consideration are known. Exemplary of such devices are those disclosed in U.S. Patents Nos. 1,069,388; 2,350,205 and 3,147,887. One of the principal disadvantages of such prior art devices is an economic one. Generally speaking, these devices are constructed from a number of intricately die-stamped and machined metal parts which must be assembled in a particular way with specialized equipment. These factors, of course, adversely affect manufacturing costs. Apart from their economic disadvantages, prior art fluid dispensing devices of the type disclosed in the aforementioned U.S. patents have certain functional shortcomings. Thus, for example, the rigid materials of which the devices are constructed cannot compensate for any irregularities in external dimensions of metal containers to be opened by them. This, coupled with the fact that in certain instances only limited or edge contact is made between the clamping members of the devices and the side walls of the containers, can place unbalanced stresses on the side walls of the containers which can cause them to buckle at their points of contact with the clamping members and thereby result in incomplete penetration of the piercing member carried by the devices and an improper fluid seal at the opening formed thereby, or, in some cases, may cause rupturing at one of the seams of the containers with the result that fluid in the containers will be wasted.

In accordance with the present invention there is provided an improved fluid dispensing device which overcomes the aforementioned disadvantages of prior art devices of the type here under consideration. The device of the present invention can be manufactured from inexpensive, easy-to-handle raw materials with a minimum of time, labor and equipment. The resilient character of the material of which the device is fabricated, together with the substantial area of contact provided by the container-engaging portions of the device, enable the device readily to resiliently conform to any irregularities in the side wall of the container and to distribute over a large area any undue stresses placed on the side wall thereby always to assure proper penetration and establishment of a fluid tight seal at the opening made by the device in the side

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wall of the container while substantially eliminating the possibility of rupturing a seam of the container.

The device of the present invention essentially comprises an integral, resilient, one-piece, annularly shaped, molded plastic body portion having a relatively wide, substantially continuous, vertical, annular container-engaging inner wall and separable, normally circumferentially spaced ends, the walls of which are joined to the inner wall of the one-piece body portion and extend outwardly therefrom. The body portion has a pivotable handle secured to it to enable the separable ends thereof to be spread apart to a container-receiving condition and to be moved into engagement with each other to a container-clamping condition. A hollow, tubular container-piercing blade or needle is carried by the one-piece body portion and extends inwardly of the inner wall thereof. The needle is provided with fluid sealing means and is in communication with an outwardly extending connector formed integrally with the body portion for draining fluid from a container opened by the device. The base of the one-piece body portion is provided with container-supporting members and forms with the bottom surface of the inner wall of the body portion an annular recess for receiving the head at the ends of a fluid container. The device of the present invention, while being light in weight, is rugged and can easily withstand the forces placed on it in opening a container of fluid. In addition, it is resistant to attack by chemicals and retains its resilient properties for a prolonged period.

These and other objects, advantages and features of the invention will become apparent upon making reference to the specification to follow, the claims and the accompanying drawings wherein:

FIG. 1 is a view in perspective of an embodiment of the device of the present invention with a container of fluid positioned therein preparatory to opening it and draining fluid therefrom;

FIG. 2 is a top plan view of said embodiment of the device showing the relative positions of the various portions of the device prior to opening a container positioned therein;

FIG. 3 is a fragmentary top plan view of said embodiment of the device showing the position of the separable ends of the one-piece body portion as the handle of the device is operated to effect opening of a container;

FIG. 4 is a fragmentary vertical sectional view taken substantially along line 4—4 of FIG. 2;

FIG. 5 is a fragmentary vertical sectional view taken substantially along line 5—5 of FIG. 2; and

FIG. 6 is a fragmentary vertical sectional view taken substantially along line 6—6 of FIG. 2.

Referring now in greater detail to the drawing, the embodiment of the device illustrated, designated generally by reference numeral 10, has an essentially integral, one-piece, generally annular, body portion 12 having normally circumferentially spaced ends 14 and 16 of different dimensions. The portion 12 is formed, as by molding, of a resilient, somewhat pliable, plastic material such as polyethylene, polypropylene, polyvinylchloride, polyvinylacetate, or the like. The body portion 12, for the greater part of its perimeter, comprises an outer, downwardly extending portion 18 and inner, upwardly extending portion 20. The bottom surface 22 of the portion 20 is elevated with respect to the bottom surface 24 of the portion 18 and thus forms a substantially annular recess 26 with the narrow inner, exposed wall 28 of the portion 18. The portion 20 has an inner, annular, container-engaging wall 30 which is joined to opposed, outwardly extending walls 32 and 34 of the spaced ends 14 and 16, respectively, of the body portion 12.

The body portion 12 is formed with an outwardly extending, enlarged, boss-like portion 36. The portion 36 is

provided with a recess 38 which extends from an opening 40 in the inner, container-engaging wall 30 of the body portion 12 to a point inwardly of the boss-like portion 36 where it communicates with a relatively small diameter bore 42 through the portion 36. The bore 42 communicates at its outlet end with a hollow, ridged nipple or connector 44 which, in the embodiment of the device 10 illustrated, is formed integral with the boss-like portion 36. The inlet end of the bore 42 is counterbored to enable a hollow, tubular, container-piercing blade or needle 46 to be secured, as by press-fitting, in the boss-like portion 36. The needle 46 is made of metal and has a sharpened end 48 which extends inwardly of the inner wall 30 of the body portion 12. A sealing gasket 52, in the form of a piece of rubber or rubber-like hose or tubing and having a length slightly greater than that of the exposed portion of the needle 46, is fitted over the needle 46. The function of the gasket 52 will become clear as the description proceeds.

Secured to the bottom surface 24 of the portion 18 of the body portion 12, at the boss-like portion 36, is a support section 54. The support section 54 has a truncated, generally triangularly-shaped portion 56 which extends inwardly of the body portion 12. The portion 56 has an opening 58 therethrough which has a length and width sufficient to enable easy access, from below, to the gasket 52 and the needle 46. The bottom surface 24 of the portion 18 also has secured to it a rectangularly shaped support section 60 which, when the ends 14 and 16 are in engagement, is located substantially diametrically opposite the section 54. The section 60 has a portion 62 which extends inwardly of the inner wall 30 and a portion 64 which extends outwardly of the portion 18 of the body portion 12. The portion 64 is provided with an opening 66 therethrough which can be used to hang the device 10, when not in use, or to fasten it in a fixed position on a suitable support surface. The portions 56 and 62 of the support sections 54 and 60, respectively, among other things, act to support a container 70 to be opened by the device 10. The resiliency of the plastic material of which the body portion 12 is made enables the ends 14 and 16 thereof to be moved to a fully opened position as shown in FIG. 2 to a fully closed position as shown in FIG. 3 by means of a pivotal lever or handle 80. The handle 80 advantageously is made of metal and is provided at one end with a pair of inwardly extending, elongated substantially parallel flanges 82-82. The flanges 82-82 are pivotally secured at their outer ends to opposite sides of the narrow end 14 of the body portion 12 by a pin 84. One end of a pair of links 86-86 is pivotally secured in overlying relation to the inner ends of the flanges 82-82 by rivets 85-85 while the other end of each of the links 86-86 is pivotally secured to opposite sides of the wider end 16 of the body portion 12 by a pin 88. The bottom surface 24 of the outer portion 18 of the body portion 12 is cut away adjacent the narrow end 14 to accommodate the flange 82 pivotally secured to the lower side of the end 14 to enable the handle 80 to be moved to a position whereby the ends 14 and 16 will be brought to a fully closed condition.

To operate the device, the handle 80 is moved to the position shown in FIG. 2. In this position the walls of the ends 14 and 16 are in substantially parallel, spaced relation and the diameter of the substantially circular area defined by the inner wall 30 is greater than the diameter of the base of the container 70. The container 70 is then positioned on the inwardly extending portions 56 and 62 of the support sections 54 and 60. With the container 70 in this position, the handle 80 is pivoted in a manner to bring the ends 14 and 16 together. As viewed in FIGS. 2 and 3 of the drawing, this movement is in a clockwise direction. As the ends 14 and 16 are brought together by the handle 80, the inner wall 30 engages the side wall of the container for the greater part of its perimeter, and the bead 90, at the base of the container, is engaged in the

annular recess 26. The container 70 is thus securely held in the device. The large area of contact between the inner wall 30 and the side wall of the container, plus the resilient character of the plastic material of which the body portion 12 is made enables the handle 80 to positively move the container toward the sharp-ended needle 46. As the ends 14 and 16 are brought into engagement by the movement of the handle 80, the sharpened end 48 of the needle 46 pierces the side wall of the container and the needle penetrates the container. Fluid in the container then passes through the needle 46, the bore 36 and the connector 38 from where it can be conveyed through a suitable tube or hose 92 to a desired location. The gasket 52 provides a fluid tight seal at the point of penetration of the needle 46 throughout the time the container is being drained of fluid. The entire operation can be performed quickly and with minimal effort on the part of an operator. The device is self-locking and maintains the ends 14 and 16 in a fully closed condition without the necessity for maintaining pressure on the handle 80. The annular recess 26 and the large area of contact between the inner wall 30 and the side wall of the container prevent the needle 46 from inadvertently becoming dislodged from the container. After the container has been drained, it is merely necessary to grasp the container and pivot the handle 80 to its release position during which operation the needle 46 will be withdrawn from the container.

It should be understood that various modifications may be made in the preferred embodiment of the invention above described without departing from the broader aspects of the invention.

What is claimed is:

1. A device for puncturing a hole in a cylindrical container and dispensing fluid therefrom, said cylindrical container having a bead at each end thereof, comprising an integral, one-piece, substantially annular, molded, resilient plastic body member having an outer, downwardly extending container bead-engaging portion and an inner, upwardly extending cylindrical container wall-engaging portion which is proportioned to encircle and engage the vertical side wall of a cylindrical container having a bead at each end thereof in a plane at substantially a right angle to the vertical axis of the cylindrical container, said outer, downwardly extending base portion and said inner, upwardly extending cylindrical container wall-engaging portion together defining a substantially annular recess at the base of the body member for receiving the bead at one of the ends of the cylindrical container, said body member having movable ends which are joined to the container wall-engaging portion and extending outwardly therefrom and which are in spaced apart relation with respect to one another when the one-piece body member is in an open position and are in engagement with one another when the one-piece body member is in a closed position, said cylindrical container well-engaging portion of the body member having an inner wall which provides a large, substantially continuous area of contact for engaging the vertical side wall of the cylindrical container when the one-piece body member is in a closed position and which due to the resilient character of the plastic of the body member is capable of resiliently conforming to the vertical side wall of the cylindrical container when the one-piece body member is in a closed position thereby to substantially prevent any buckling of the vertical side wall of the cylindrical container which may cause rupturing at the seams thereof with the result that fluid in the container will be wasted, said inner wall in the open position of the body member defining an essentially circular container-receiving area in the one-piece body member which has a diameter greater than that of the cylindrical container to be opened, a handle portion pivotally secured at one of its ends to one of the movable ends of the one-piece body member, linking means pivotally secured to the other of the movable ends of the one-piece body member and to the handle portion at a point

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spaced from said pivotably secured end of the handle portion, an enlarged recess formed in the one-piece body member which opens into said container-receiving area, hollow container-penetrating means positioned in said enlarged recess of the body member and extending inwardly of the inner wall of the container wall-engaging portion thereof, said container-penetrating means in the closed position of the body member acting to pierce the vertical side wall of the cylindrical container as said inner wall is moved inwardly in a plane at substantially a right angle to the vertical axis of the cylindrical container and resiliently substantially conforms to the configuration of the vertical side wall thereof as the movable ends of the one-piece body member are brought into engagement with one another by operation of the handle portion, container bottom support means secured to the one-piece body member for supporting the cylindrical container in an upright position in the container-receiving area of the one-piece body member and for guiding both the bead at the

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end of the cylindrical container supported thereon into the substantially annular recess at the base of the one-piece body member and the vertical side wall of the cylindrical container toward the hollow container-penetrating means as the movable ends of the one-piece body member are brought into engagement by movement of the handle portion, and conduit means communicating with said container-penetrating means for draining fluid from the pierced cylindrical container.

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