

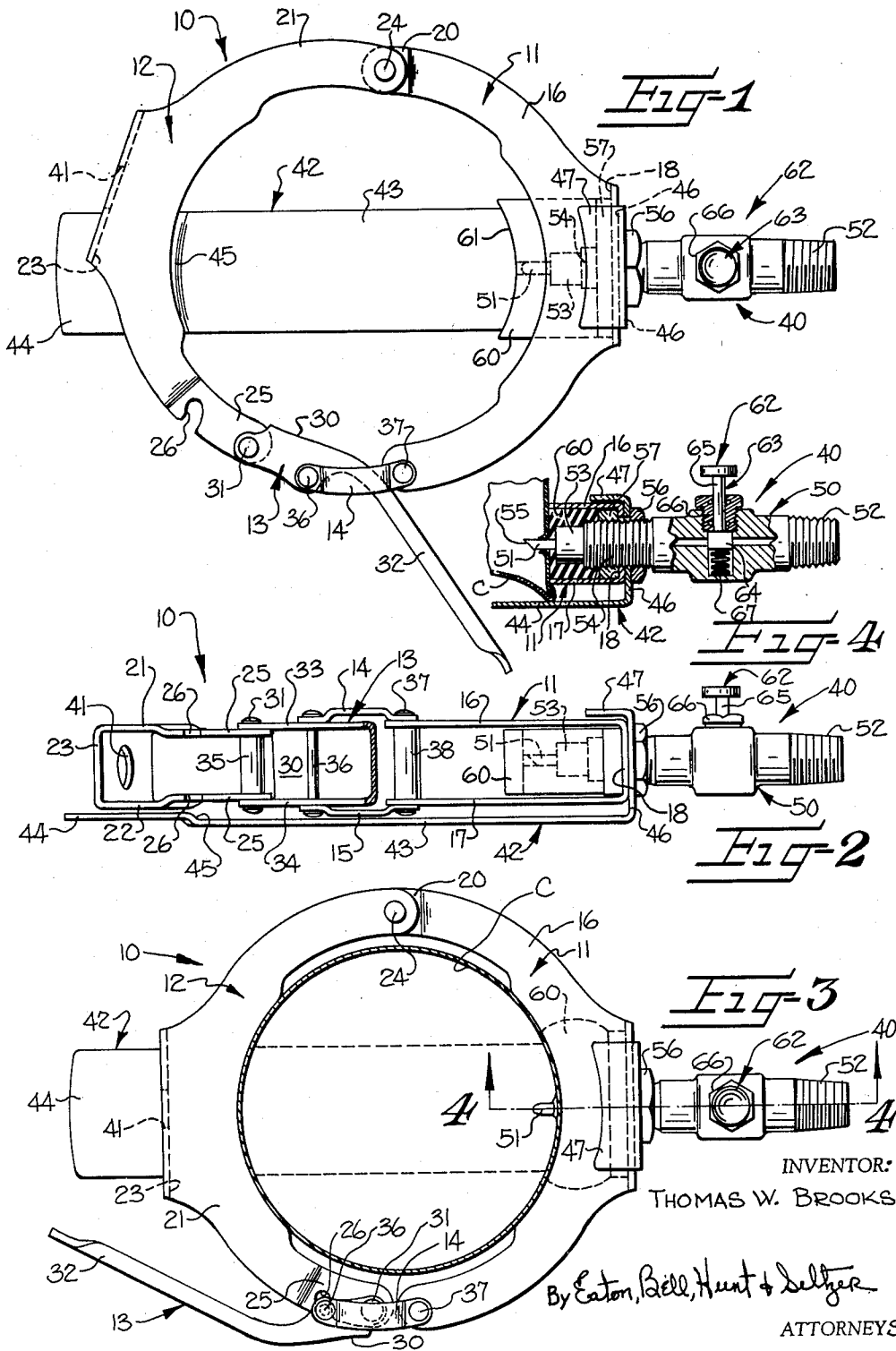
Sept. 8, 1964

T. W. BROOKS

3,147,887

DISPENSING DEVICE

Filed Aug. 7, 1961



1

3,147,887

DISPENSING DEVICE

Thomas W. Brooks, Charlotte, N.C., assignor to Southeastern Tool & Dye Company, Inc., Charlotte, N.C., a corporation of North Carolina

Filed Aug. 7, 1961, Ser. No. 129,584

6 Claims. (Cl. 222-83.5)

The present invention relates to an improved device for dispensing fluid from a container about which the device is clamped.

More particularly, this invention relates to an improved device for dispensing fluid under pressure from a container, the dispensing device being of the character adapted to be clamped about the container and having means for puncturing the container when clamped thereabout so as to dispense the contents from the container through the puncture formed therein.

The practice of dispensing fluid from a container by means of a device which is clamped about the container and has a puncturing element for piercing a wall of the container when the device is clamped thereabout in order to provide an outlet in the container through which the fluid contents of the container may be discharged is common. Dispensing devices of the aforesaid general type are characterized by the presence of an elongated flexible band which has been bent or bowed to turn its opposite ends inwardly toward each other to place the band in a substantially annular state, wherein the band is adapted to encircle a container, such as a can. The flexible band is movable between expanded and constricted positions, in which the can is respectively loosely received within the band and tightly clamped therein, by means of a pivotal lever arm associated therewith. The pivotal movement of the lever arm in a direction causing the constriction of the flexible band about the can results in the formation of a dispensing outlet in the can by a puncturing element associated with the flexible band, the puncturing element piercing a wall of the can as the band is being constricted thereabout. The natural tendency of the flexible band to snap back from its deformed bowed state to a relaxed state of elongation causes the lever arm associated therewith to exhibit highly erratic resistance to its pivotal movement in either direction, whereby the efforts of an operator seeking to manipulate the lever arm are likely to produce uncertain and irregular pivotal movement of the lever arm. In fact, once the pivotal movement of the lever arm has proceeded past a point of equilibrium with respect to the bowed flexible band, what may be described as a whip-lash motion of the lever arm takes place in which the pivotal movement of the lever arm is rapidly accelerated because of the force imparted thereto by the overbalancing tendency of the flexible band to return to its natural relaxed state. This sudden and unpredictable whip-lash motion of the lever arm creates a hazardous condition in which the fingers of the operator manipulating the lever arm are likely to be pinched or smashed between the lever arm and the flexible band or other components of the dispensing device.

Dispensing devices of this general character have also been constructed in such a manner that the constriction of a clamping band about a container to be punctured by a puncturing element of the device causes the container to be drawn toward the puncturing element in an irregular, off-center path of movement. Accordingly, where the container is of the type provided with a readily frangible wall area to facilitate puncturing thereof by the puncturing element of the dispensing device, such irregular and off-center movement of the container toward the puncturing element as the dispensing device is clamped thereabout may cause the puncturing

2

element to completely miss the frangible wall area on the container, thereby making it necessary for the puncturing element to penetrate a rigid portion of the container wall in order to form an outlet in the container through which its contents may be dispensed. Often the wall of such a container apart from the readily frangible wall area is constructed so as to be virtually impenetrable. Under these circumstances, the puncturing element of the dispensing device is apt to be broken if it misses the frangible wall area of the container as the dispensing device is being clamped about the container, thereby rendering the dispensing device useless until the necessary replacement or repair of the puncturing element can be effected.

Even when the puncturing element of the dispensing device may be capable of penetrating the wall of the container forced thereagainst by the constriction of the dispensing device about the container, the irregular and off-center movement of the container toward the puncturing element is likely to cause the container wall to be brought against the puncturing element in an abnormal angular relationship, thereby resulting in the puncturing element deflecting or glancing off of the container wall, or making an imperfect penetration there-through. Dispensing of the contents from a container acted upon by the dispensing device in the above-described manner may either prove to be impossible in instances where the puncturing element of the dispensing device failed to penetrate the container wall or may be accompanied by leakage of the contents of the container at the boundaries of the outlet formed in the container wall by the imperfect entry of the puncturing element therethrough.

Dispensing devices of the character described are often employed with containers having highly poisonous gaseous contents suitable for fumigating purposes, and when an imperfect entry of the puncturing element through a container wall takes place, a dangerous situation can be created by the leakage of poisonous fumes about the boundaries of the imperfect and irregular aperture formed as a dispensing outlet in the container wall by the puncturing element. Frequently, the imperfect entry of the puncturing element through the container wall forms a dispensing outlet for the container which defies efforts to establish a fluid-tight sealing relationship between the container wall where the outlet is formed and the conduit of the dispensing device through which the contents of the container are to be dispensed even when a resilient sealing gasket of rubber or similar elastomeric material is employed about the puncturing element for engagement with the portion of the container wall surrounding the outlet.

It is an object of the present invention to provide an improved dispensing device having a constrictive frame carrying a puncturing element, wherein the frame is adapted to be clamped about a container in its constricted position to enable the puncturing element to penetrate the container wall for forming an outlet in the container for discharging the contents therefrom, the frame comprising a plurality of rigid frame segments defining a container-receiving opening and being movable between expanded and constricted positions with respect to the container received thereby through pivotal manipulation of a lever arm without producing an accompanying whip-lash action on the part of the lever arm, since the pivotal movement of the lever arm is substantially unimpeded by any resistant counter-force.

It is another object of this invention to provide an improved dispensing device having a constrictive segmental frame carrying a puncturing element, wherein the frame is initially disposed in expanded position for loosely receiving a container and is thereafter constricted into

3

clamping relationship about the container so as to cause relative movement of the container against the puncturing element in a direct predetermined path of movement, whereby the puncturing element will penetrate the wall of the container at a selected location thereon to form a satisfactory dispensing outlet in the container. The possibility that the puncturing element in the improved dispensing device of the present invention may imperfectly penetrate or fail to penetrate the container wall is consequently virtually eliminated.

It is another object of this invention to provide an improved means in a dispensing device for clamping about a container, wherein the improved clamping means comprises an annular constrictive segmental frame having a pair of frame segments pivotally interconnected at one of their respective ends and spaced apart at the other of their respective ends when the frame is in expanded position for loosely receiving the container, there being a lever arm pivotally interconnected to the other end of one frame segment and a pair of links straddling the lever arm and pivotally interconnected to the other end of the other frame segment and to corresponding medial positions on opposite sides of the lever arm to span the distance between the other ends of the frame segments in the expanded position of the frame, whereby pivotal movement of the lever arm in a predetermined direction causes the pair of links and a portion of the lever arm to be superimposed over a portion of the frame segment to which the lever arm is pivotally interconnected for constricting the frame in clamping relationship about the container. The protrusion of some component of clamping mechanisms for dispensing devices heretofore known within the container-receiving enclosure frequently disrupts the continuity of constriction of such clamping mechanisms about the container and is one cause of inefficient operation. The improved clamping means of the present invention insures that the pivotal movement of the lever arm moving the frame between expanded and constricted positions will take place in such a manner that no portion of the lever arm will protrude within the enclosure defined by the frame in which the container is received.

It is another object of this invention to provide an improved dispensing device having a constrictive frame to be clamped about a container for forcing a puncturing element carried by the frame through the container wall, wherein an effective fluid-tight sealing relationship is maintained between a dispensing conduit of the dispensing device and the wall of the container bounding the outlet formed in the container by the puncturing element, and valve means are provided in the dispensing conduit of the device to enable an operator to control the flow of contents outwardly of the container so as to regulate the dispensing of the contents of the container in any given operation as desired.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

FIGURE 1 shows a plan view of a dispensing device in accordance with the present invention, the dispensing device being illustrated in expanded position;

FIGURE 2 is a side elevational view of the dispensing device of FIGURE 1 with a part (the lever arm) shown in FIGURE 1 being broken away for purposes of clarity;

FIGURE 3 is a plan view similar to FIGURE 1, but showing the dispensing device in constricted position and clamped about a container received thereby; and

FIGURE 4 is a fragmentary vertical sectional view taken along the line 4—4 in FIGURE 3.

Referring more specifically to the drawings, the dispensing device of the present invention comprises an annular frame designated broadly by reference numeral 10, the annular frame 10 being movable between an expanded position, as illustrated in FIGURE 1, in which a

4

container C (FIGURE 3) is loosely received thereby and a constricted position, as illustrated in FIGURE 3, in which the container C is received in clamped relationship therewithin as will be hereinafter described. As illustrated, the annular frame 10 includes a pair of arcuate frame segments 11, 12, a lever arm 13 and a pair of links 14, 15—these elements being pivotally interconnected to define an endless open-ended annular frame 10 providing an enclosed region for receiving the container C therein.

It will be seen in FIGURE 2 that the arcuate frame segment 11 includes upper and lower vertically aligned arcuate bands 16, 17 respectively, the bands 16, 17 being disposed in parallel relationship and being rigidly interconnected by a vertical web 18 extending therebetween medially of the opposite ends of the frame segment 11. It will be further observed in FIGURES 1 and 3 that corresponding end portions at one end of each of the upper and lower arcuate bands 16, 17 of the frame segment 11 are inwardly offset with respect to the remaining portions of the arcuate bands 16, 17 to be disposed closer together for defining connector tabs 20, 20 respectively—the connector tabs being adapted to receive the opposing end of the frame segment 12 in a manner to be presently described.

The arcuate frame segment 12 is similar to the frame segment 11, as it also includes upper and lower vertically aligned arcuate bands 21, 22 disposed in parallel relationship and being rigidly interconnected by a vertical web 23 extending therebetween medially of the opposite ends of the frame segment 12. The ends of the arcuate bands 21, 22 of frame segment 12 which correspond with the inwardly offset end portions or connector tabs 20, 20 of the arcuate bands 16, 17 of the frame segment 11 are respectively received in overlying relationship therewith to dispose the arcuate bands 21, 22 in substantially flush relation with the remaining portions of the arcuate bands 16, 17 respectively, the frame segments 11, 12 being pivotally interconnected at this point by suitable means, such as a pin 24, penetrating the respective overlapping ends of the arcuate bands 21, 16 and 22, 17. A spacer means in the form of a tubular sleeve (not shown) loosely receiving the pin 24 and extending between the inwardly offset end portions or connector tabs 20, 20 of the arcuate bands 16, 17 is preferably provided to reinforce the respective overlapping ends of the arcuate bands 21, 16 and 22, 17.

The ends of the frame segments 11 and 12 opposite from their previously described pivotally interconnected ends are maintained in spaced apart relationship when the annular frame 10 is in the expanded position illustrated in FIGURE 1. It will be observed in FIGURE 2 that the ends of the arcuate bands 21, 22 of frame segment 12 which are spaced apart from the opposing arcuate bands 16, 17 of the frame segment 11 when the annular frame 10 is in expanded position include inwardly offset end portions or terminal tabs 25, 25 respectively, the terminal tabs being disposed closer together than the remaining portions of the arcuate bands 21, 22 to provide a relationship therebetween similar to that existing between the connector tabs 20, 20 and the arcuate bands 16, 17. Vertically aligned notches 26, 26 are provided in the terminal tabs 25, 25 for a purpose to be subsequently described.

Means are provided to maintain the last-discussed ends of the frame segments 11, 12 in spaced apart relationship when the frame 10 is in expanded position—such spacing means comprising the lever arm 13 and the links 14, 15. The lever arm 13 may be described as having an inner end or body portion 30 pivotally connected by suitable means, such as a pin 31, to the inwardly offset end portions or terminal tabs 25, 25 of the arcuate bands 21, 22 of frame segment 12 and a handle 32 extending from the body portion 30 at a point remote from the pivotal connection between the body

5

portion 30 and the frame segment 12. The body portion 30 of the lever arm 13 includes a pair of upper and lower vertically aligned flanges 33, 34 (FIGURE 2) disposed in parallel relationship, the flanges 33, 34 of the body portion 30 partially overlying the corresponding terminal tabs or inwardly offset end portions 25, 25 of the arcuate bands 21, 22 when the frame 10 is in expanded position for reception of the pivot pin 31 so as to dispose the upper and lower extremities of the lever arm 13 as defined by the flanges 33, 34 substantially flush with the upper and lower arcuate bands 16, 17 and 21, 22 of the frame segments 11 and 12, respectively. As shown in FIGURE 2, a spacer means in the form of a tubular sleeve 35 extends between the terminal tabs 25, 25 of the arcuate bands 21, 22, the sleeve 35 loosely receiving the pivot pin 31 and reinforcing the arcuate bands 21, 22 of the frame segment 12 and the flanges 33, 34 of the lever arm 13.

Completing the means spacing opposed ends of the frame segments 11 and 12 apart in the expanded position of the annular frame 10 are the pair of links 14, 15 which extend between the body portion 30 of the lever arm 13 and the opposed ends of the arcuate bands 16, 17 of the frame segment 11 to bridge the gap therebetween. It will be noted that the pair of links 14, 15 are substantially arcuate in shape and are pivotally interconnected at their opposite ends with the body portion 30 of the lever arm 13 and the opposed ends of the arcuate bands 16, 17 respectively. The pair of links 14, 15 thereby straddle the handle 32 of the lever arm 13 to permit movement of the handle 32 and the body portion 30 of the lever arm 13 therebetween upon pivoting the lever arm 13 about pin 31 by moving the handle 32 in a clock-wise direction as viewed in FIGURE 1 to move the annular frame 10 from expanded to constricted position for clamping the container C therein in the manner illustrated in FIGURE 3. In this connection, the corresponding ends of the pair of links 14, 15 are pivotally interconnected by suitable means, such as a pin 36, to the upper and lower flanges 33, 34 respectively of the body portion 30 of the lever arm 13 at a medial location on the lever arm 13, while the opposite ends of the pair of links 14, 15 are pivotally interconnected by suitable means, such as a pin 37, to the opposed ends of the arcuate bands 16, 17 of the frame segment 11. In a manner similar to that described with respect to pivot pins 24 and 31, the pivot pin 37 is loosely received by a tubular spacer sleeve 38 extending between the arcuate bands 16, 17 for reinforcement thereof.

Either one of the vertical webs 18, 23 respectively interconnecting the arcuate bands 16, 17 of frame segment 11 and the arcuate bands 21, 22 of frame segment 12 may be utilized as a carrier for a tubular dispensing means 40 extending laterally with respect to the annular frame 10 within the container-receiving enclosure defined by the frame 10 and outwardly of the frame 10. In the illustrated embodiment, the vertical web 18 interconnecting the arcuate bands 16, 17 of frame segment 11 has been so employed, there being an aperture formed therein similar to the aperture 41 in the vertical web 23, as shown in FIGURE 2, for reception of the tubular dispensing means 40. It will be observed that a container support bracket 42 is provided in conjunction with the annular frame 10 for supporting an end of the container C received within the frame 10 (FIGURE 4). The support bracket 42 includes a substantially flat base plate 43 extending diametrically across the circular enclosure bounded by the frame 10 and disposed beneath the frame (FIGURE 2), the flat base plate 43 having a raised lip 44 extending from an end thereof remote from the vertical web 18 in offset parallel relationship to the plate 43 for defining an arcuate shoulder 45 therebetween in substantial alinement with the web 18. The arcuate shoulder 45 is adapted to substantially conform with an end edge of the container C received within the frame

6

10 and cooperates with inner peripheral portions of the arcuate bands 21, 22 to limit lateral endwise displacement of the container C within the frame 10. The support bracket 42 further includes vertical leg 46 integral with the opposite end of the base plate 43 and extending upwardly therefrom to overlie the web 18, the leg 46 being provided with a suitable aperture aligned with the aperture in the web 18, as illustrated in FIGURE 4. Preferably, a horizontally extending keeper skirt 47 is formed integral with the upper end of the leg 46 of the support bracket 42, the keeper skirt 47 being arranged in spaced parallel relationship to the base plate 43 and overlying a portion of the arcuate band 16 of the frame segment 11 to assist in the assembly and alinement of the support bracket 42 on the annular frame 10.

As best shown in FIGURE 4, the tubular dispensing means 40 takes the form of a conduit 50 having a hollow puncturing element 51 on one end which protrudes within the circular container-receiving enclosure defined by the frame 10. The conduit 50 extends through the aligned apertures in the vertical web 18 and the leg 46 of the support bracket 42, and includes an externally threaded outer end portion or nozzle 52 through which the contents of the container C received within the annular frame 10 are discharged in a dispensing operation, an inner end portion 53, and an intermediate externally threaded connector portion 54 joining the outer and inner end portions 52 and 53 of the conduit 50. The intermediate connector portion 54 of the conduit 50 is adapted to be disposed within the aligned apertures in the web 18 and the leg 46.

The hollow puncturing element 51 associated with the conduit 50 is in the form of a hollow needle forming an inner extension of the inner end portion 53 of the conduit 50, the hollow needle 51 being of reduced diameter with respect to the remainder of the conduit 50 and having a sharpened beveled cutting edge 55 for readily puncturing the wall of the container C when the annular frame 10 is constricted thereabout as hereinafter appears.

A jamb nut 56 and a backing plate 57 are respectively disposed on opposite sides of the partition defined by the web 18 and the leg 46, nut 56 being threadably received about the intermediate conduit portion 54 and in abutment with leg 46. Backing plate 57 is rectangular in shape and is positioned in the vertical space existing between the arcuate bands 16 and 17 in abutment with web 18. A suitable aperture is provided in the backing plate 57 to threadably receive the intermediate conduit portion 54 which extends therethrough. In this manner, means are provided for adjustably securing the tubular dispensing means 40 to the annular frame 10 so as to dispose the hollow needle 51 at the inner end portion 53 of conduit 50 radially inwardly of the frame segment 11 to which the tubular dispensing means 40 is secured. It will be understood that appropriate rotative manipulation of the conduit 50 with respect to the backing plate 57 can be employed to selectively move the hollow needle 51 on the inner end portion 53 of conduit 50 either radially inwardly or outwardly with respect to the center of the container-receiving enclosure defined by the annular frame 10. The backing plate 57 being rectangular is restrained from rotating with the conduit 50 because of the prospective abutment of its upper or lower marginal edge with the arcuate band 16 or 17, respectively.

Sealing means to insure a fluid-tight sealing relationship between the arcuate bands 16, 17 of the frame segment 11, the portions of the container wall bordering the puncture to be formed therein by the hollow needle 51, and the tubular dispensing means 40 including the hollow needle 51 are provided in the form of a block-like gasket 60 made of a suitable resilient sealing material, such as rubber. The sealing gasket 60 surrounds the hollow needle 51 and the inner end conduit portion 53 in

sealing engagement therewith and further sealingly engages the arcuate bands 16 and 17 between which it is received. As shown in FIGURE 1, the gasket 60 extends inwardly of the hollow needle 51 when the dispensing device is disposed with its annular frame 10 in expanded position to mask or cover the sharpened beveled cutting edge 55 of the hollow needle 51 within the gasket 60, thereby preventing accidents to the hand of a person handling the dispensing device because of exposure of a sharp cutting edge. The inwardly directed surface 61 of the sealing gasket is preferably of concave shape to substantially conform to the cylindrical wall of the container C to be received within the annular frame 10 in sealing relationship therewith.

As will be noted in FIGURE 3, the inwardly directed concave surface 61 of the gasket 60 is forced outwardly by engagement with the container wall upon introduction of the container C into the annular frame 10, and the gasket 60 is further compressed when the lever arm 13 is pivoted about pin 31 in a clock-wise direction to constrict the annular frame 10 into clamping relationship with the container C, thereby causing the initially parallel side surfaces of the sealing gasket 60 to be bowed outwardly, as shown in phantom lines.

A manually operable valve means 62 is preferably provided in the outer end conduit portion 52 to control or regulate the flow of contents from the container C received within the annular frame 10 of the dispensing device. The valve means 62 comprises a slidable valve member 63 which includes a plug 64 on the lower end of a stem 65, the valve stem 65 being received within a valve bonnet 66 threadably mounted on the outer end conduit portion 52 and the plug 64 being disposed for abutment with a lower end shoulder of the valve bonnet 66. A coil spring 67 is seated beneath the plug 64 and biases the plug 64 against the end shoulder of the bonnet 66 which serves as a valve seat. When disposed in abutment with the bonnet 66, the plug 64 blocks the passageway through the conduit 50—this being the normal closed position of the valve means 62. Manual depression of the valve member 63 causes longitudinal movement thereof with respect to the bonnet 66 to move the plug 64 away from the bonnet 66 against the biasing force of the spring 67. The plug 64 is therefore displaced below the passageway through the conduit 50 to open the valve means 62 and allow contents from the container C to be dispensed through the conduit 50. The spring 67 restores the plug 64 to the closed position of the valve means 62 by biasing the plug 64 against the bonnet 66 when the manually applied downward pressure on the valve member 63 is removed to prevent further dispensing of the contents from the container C through the conduit 50.

In operating the dispensing device, it is initially arranged with its annular frame 10 in the expanded position shown in FIGURE 1 for loosely receiving the container C from which fluid contents are to be dispensed. In this expanded position, it will be observed that the ends of the frame segments 11 and 12 opposite from the ends of these segments which are pivotally interconnected by pin 24 are spaced apart by spacing means comprising the body portion 30 of the lever arm 13 and the pair of links 14, 15 straddling the lever arm 13. Upon placing the container C within the annular frame 10, the bottom edge of the container C comes to rest against the base plate 43 of the bracket support 42 (FIGURE 4) and the container wall is disposed in proximity to or sealing engagement with the concave surface 61 of the gasket 60.

As previously noted, the confinement of the container C within the annular frame 10 is preferably of a loose nature when the annular frame 10 is in the expanded position to readily permit the withdrawal and reinsertion of the container C within the annular frame 10. Under such conditions, no initial sealing engagement occurs between the gasket 60 and the container C. However, it is within the spirit of this invention to place the gasket

60 under slight initial compression by causing a sealing engagement to the present between the gasket 60 and the container C in the expanded position of the annular frame 10 in which case the gasket 60 will serve to releasably retain the container C loosely received within the expanded annular frame 10. In each instance, it will be understood that the cutting edge 55 of the hollow needle 51 is maintained out of contact with the container wall in the expanded position of the annular frame 10 by the masking effect of the gasket 60 which envelopes the hollow needle 51.

Upon grasping the handle 32 of the lever arm 13 and pivoting the lever arm 13 in a clock-wise direction, as viewed in FIGURE 1, about the pin 31 pivotally mounting the upper and lower flanges 33, 34 of the body portion 30 of lever arm 13 in overlying relationship with the inwardly offset end portions or terminal tabs 25, 25 of the arcuate bands 21, 22, it will be seen that the upper and lower flanges 33, 34 and the pair of links 14, 15 will be moved into superimposed nested relationship with the terminal tabs 25, 25 of the upper and lower arcuate bands 21, 22 for the frame segment 12. As the aforesaid pivotal movement of the lever arm 13 proceeds, the spaced apart ends of the frame segments 11, 12 will be drawn closer together. Thus, it will be seen that the circular enclosed region defined by the annular frame 10 will be reduced in size to constrict the annular frame 10 into clamping relationship with the container C (FIGURE 3). This constriction of the annular frame 10 about the container C forces the container C tightly against the sealing gasket 60 to place the gasket under compression and expose the hollow puncturing needle 51 which punctures the container wall (FIGURE 4) to provide communication between the interior of the container C and the conduit 50 for dispensing the contents of the container C outwardly through the conduit 50 when the valve 62 is open.

All elements comprising the annular frame 10 are preferably made of rigid material, such as a suitable metal or plastic, which provides for even constriction of the annular frame 10 about the container C received in the circular enclosed region defined thereby. This even constriction of the annular frame 10 has the effect of directly forcing the container C against the puncturing needle 51 to accurately predetermine the position on the container wall which will be punctured or ruptured by the needle 51 for the purpose of dispensing the contents of the container C. The sealing gasket 60, being retained under high compression between the container wall bordering the puncture formed therein by the needle 51 and in the space between the upper and lower arcuate bands 16, 17 of the frame segment 11 about the needle 51 and the inner end conduit portion 53, prevents leakage of the contents of the container C from the hole punctured therein by the needle 51 between the container C and the conduit 50.

The handle 32 of the lever arm 13 may be moved in a clock-wise direction until the vertically extending pin 36 connecting respective ends of the links 14, 15 to the upper and lower flanges 33, 34 of the body portion 30 for the lever arm 13 is received in the vertically aligned notches 26, 26 provided in the inwardly offset terminal tabs 25, 25 of the arcuate bands 21, 22 for the frame segment 12. This arrangement provides a readily releasable latching means for retaining the lever arm 13 in a position fully constricting the annular frame 10, wherein the handle 32 of the lever arm 13 is disposed in close proximity to the annular frame 10 and roughly corresponds to the outer perimeter thereof so as to guard against accidental dislodgment of the lever arm 13 and movement thereof in a counter-clockwise direction to expand the annular frame 10 when this is not desirable.

The operator by depressing the valve member 63 to unseat the plug 64 from the shoulder provided by the valve bonnet 66 opens the passageway through the conduit 50

9

to discharge the contents of the container C through the hollow needle 51 and the conduit 50. Thus, a proportionate amount of the contents of the container can be utilized as deemed necessary by the operator because of the fluid-tight seal provided between the container wall surrounding the puncture therein and the conduit 50 by the gasket 60 and the automatic retraction of the plug 64 of the valve means 62 under the biasing force of the spring 67 to a position closing the passageway through the conduit 50 upon discontinuing the depression of the valve member 63.

It will therefore be seen that I have disclosed an improved dispensing device of the type to be clamped about a container and carrying a puncturing element for puncturing a hole in a wall of the container to dispense the contents therefrom, wherein a pivotal lever arm is employed to move the clamping frame of my dispensing device between expanded and constricted positions with respect to the container. My improved construction provides for smooth pivotal movement of the lever arm without whip-lash action being imparted thereto and the inevitable accompaniment of personal injuries to the fingers of an operator which may become pinched or smashed between the lever arm and the constrictive means of dispensing devices of this general character heretofore known. Moreover, my dispensing device requires that the container received therein be forced directly against the puncturing element of the device, thereby eliminating the possibility of failure because of erratic relative movement between the container and the puncturing element where the container is provided with a frangible area of predetermined extent and the puncturing element must contact this frangible area in order to puncture the container for dispensing the contents therefrom.

In the drawings and specification there has been set forth a preferred embodiment of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. In a device for clamping about a cylindrical container, an annular frame for loosely receiving the cylindrical container comprising a pair of arcuate frame segments pivotally interconnected at one of their respective ends, each of said frame segments having upper and lower vertically aligned arcuate bands disposed in parallel relation and a vertical web extending between and interconnecting said upper and lower bands, said frame segments being spaced apart at the other of their respective ends, a lever arm extending outwardly of said frame segments and having upper and lower vertically aligned flanges disposed in parallel relation at an inner end portion thereof, said flanges being pivotally attached at the inner end of said lever arm to the upper and lower bands at the other end of one of said frame segments and extending toward the upper and lower bands of the other frame segment but stopping short thereof to define a gap therebetween, a pair of links straddling said lever arm and bridging the gap between said flanges and the upper and lower bands of the other frame segment, a pin penetrating one end of each of said links and pivotally attaching said links to respective flanges corresponding thereto at a medial location along said lever arm, the opposite end of each of said links being pivotally attached to respective upper and lower bands of the other frame segment, the upper and lower bands of said one frame segment being respectively provided with vertically aligned notches at a location intermediate the ends of said one frame segment, and said links and said flanges being movable into superimposed relationship with respective portions of the upper and lower bands of said one frame segment adjacent the other end thereof in response to pivoting of said lever arm about the pivotal attachment at its inner end between the flanges thereof and the upper and lower bands at the other end of said

10

one frame segment to draw the respective other ends of said frame segments toward each other, whereby the area of an enclosed region provided by said annular frame is reduced to constrict said frame about the cylindrical container, and said pin being received in said notches provided in the upper and lower bands of said one frame segment when said lever arm has been pivoted to constrict said frame.

2. In a device for dispensing fluid from a container, means defining an endless open ended frame providing an enclosed region for loosely receiving the container, said frame comprising a plurality of pivotally interconnected frame segments, means spacing an adjacent pair of said plurality of frame segments apart at one of their respective ends, said spacing means comprising a lever arm having a body portion and a handle, said body portion being pivotally attached at one end thereof to said one end of one of said spaced apart frame segments and extending toward the other of said spaced apart frame segments but stopping short thereof to define a gap therebetween, said handle extending outwardly from the body portion of said lever arm at a position remote from the pivotal attachment between said body portion and said one of the spaced apart frame segments with respect to the enclosed region, a link bridging the gap between said body portion and said one end of the other of said spaced apart frame segments, said link being pivotally attached at its opposite ends to said portion and the other of said spaced apart frame segments respectively, tubular dispensing means carried by said frame for puncturing the container received within the frame, said tubular dispensing means comprising a conduit extending outwardly with respect to said frame and having a hollow puncturing element on its inner end protruding inwardly of said frame within the enclosed region provided thereby, manually operable valve means in said conduit, and said link and said body portion being movable into superimposed relationship with a portion of said one frame segment adjacent said one end thereof in response to pivoting of said lever arm about the pivotal attachment between the body portion thereof and said one end of said one frame segment to draw the respective ends of said spaced apart frame segments toward each other, whereby the area of the enclosed region provided by said frame is reduced to constrict said frame about the container for puncturing the container by said hollow puncturing element to dispense fluid therefrom through said conduit upon opening said manually operable valve means.

3. In a device for dispensing fluid from a container, means defining an endless open-ended frame providing an enclosed region for loosely receiving the container, said frame comprising a plurality of pivotally interconnected frame segments, means spacing an adjacent pair of said plurality of frame segments apart at one of their respective ends, said spacing means comprising a lever arm having a body portion and a handle, said body portion being pivotally attached at one end thereof to said one end of one of said spaced apart frame segments and extending toward the other of said spaced apart frame segments but stopping short thereof to define a gap therebetween, said handle extending outwardly from the body portion of said lever arm at a position remote from the pivotal attachment between said body portion and said one of the spaced apart frame segments with respect to the enclosed region, a link bridging the gap between said body portion and said one end of the other of said spaced apart frame segments, said link being pivotally attached at its opposite ends to said body portion and the other of said spaced apart frame segments respectively, tubular dispensing means carried by said frame for puncturing the container received within the frame, said tubular dispensing means comprising a conduit extending outwardly with respect to said frame and having a hollow puncturing element on its inner end protruding inwardly of

said frame within the enclosed region provided thereby, a resilient gasket carried by said frame in surrounding relationship with respect to said hollow puncturing element, a portion of said gasket normally extending inwardly of said hollow puncturing element within the enclosed region provided by said frame to mask said hollow puncturing element and being compressible to expose said hollow puncturing element, said gasket presenting an inwardly directed surface conforming to the shape of the container received within said frame, said link and said body portion being movable into superimposed relationship with a portion of said one frame segment adjacent said one end thereof in response to pivoting of said lever arm about the pivotal attachment between the body portion thereof and said one end of said one frame segment to draw the respective ends of said spaced apart frame segments toward each other, whereby the area of the enclosed region provided by said frame is reduced to constrict said frame about the container for puncturing the container by said hollow puncturing element to dispense fluid therefrom through said conduit, and said inwardly directed surface of the gasket sealingly engaging the container prior to the puncturing thereof by said hollow puncturing element in response to constriction of said frame about the container.

4. In a device for clamping about a cylindrical container, an annular frame for loosely receiving the cylindrical container comprising a pair of arcuate frame segments pivotally interconnected at one of their respective ends, said frame segments being spaced apart at the other of their respective ends, a lever arm extending outwardly of said frame segments and having upper and lower vertically aligned flanges at an inner end portion thereof, said flanges being pivotally attached at the inner end of said lever arm to the other end of the one of said frame segments and extending toward the other frame segment but stopping short thereof to define a gap therebetween, a pair of links straddling said lever arm and bridging the gap between said flanges and the other frame segment, a pin penetrating one end of each of said links and pivotally attaching said links to respective flanges corresponding thereto at a medial location along said lever arm, the opposite end of each of said links being pivotally attached to the other frame segment, said one frame segment being provided with a vertical notch at a location intermediate the ends of said one frame segment, and said links and said flanges being movable into superimposed relationship with respective portions of said one frame segment adjacent the other end thereof in response to pivoting of said lever arm about the pivotal attachment at its inner end between the flanges thereof and the other end of said one frame segment to draw the respective other ends of said frame segments toward each other, whereby the area of an enclosed region provided by said annular frame is reduced to constrict said frame about the cylindrical container, and said pin being received in said notch provided in said one frame segment when said lever arm has been pivoted to constrict said frame.

5. In a device for dispensing fluid from a container, means defining an endless open-ended frame providing an enclosed region for loosely receiving the container, said frame comprising a plurality of pivotally interconnected frame segments, an adjacent pair of said frame segments being spaced apart at one of their respective ends, lever means extending between the spaced apart ends of said adjacent pair of frame segments and connected thereto for pivotal movement about said one end of one of said adjacent pair of frame segments in a direction drawing the spaced apart ends of said adjacent pair of frame segments toward each other, tubular dispensing means carried by said frame for puncturing the container received

within the frame, said tubular dispensing means comprising a conduit extending outwardly with respect to said frame and having a hollow puncturing element on its inner end protruding inwardly of said frame within the enclosed region provided thereby, a resilient gasket carried by said frame in surrounding relationship with respect to said hollow puncturing element, a portion of said gasket normally extending inwardly of said hollow puncturing element within the enclosed region provided by said frame to mask said hollow puncturing element and being compressible to expose said hollow puncturing element, said gasket presenting an inwardly directed surface conforming to the shape of the container received within said frame, and said lever means being pivotable to draw the spaced apart ends of said adjacent pair of frame segments toward each other, whereby the area of the enclosed region provided by said frame is reduced to constrict said frame about the container for puncturing the container by said hollow puncturing element to dispense fluid therefrom through said conduit, and said inwardly directed surface of the gasket sealingly engaging the container prior to the puncturing thereof by said hollow puncturing element in response to constriction of said frame about the container.

6. In a device for dispensing fluid from a container, means defining an endless open-ended frame providing an enclosed region for loosely receiving the container, said frame comprising a plurality of pivotally interconnected frame segments, an adjacent pair of said plurality of frame segments being spaced apart at one of their respective ends, lever means extending between the spaced apart ends of said adjacent pair of frame segments and connected thereto for pivotal movement about said one end of one of said adjacent pair of frame segments in a direction drawing the spaced apart ends of said adjacent pair of frame segments toward each other, tubular dispensing means carried by said frame for puncturing the container received within the frame, said tubular dispensing means comprising a conduit extending outwardly with respect to said frame and having a hollow puncturing element on its inner end protruding inwardly of said frame within the enclosed region provided thereby, a resilient gasket carried by said frame in surrounding relationship with respect to said hollow puncturing element, a portion of said gasket normally extending inwardly of said hollow puncturing element within the enclosed region provided by said frame to mask said hollow puncturing element and being compressible to expose said hollow puncturing element, said gasket presenting an inwardly directed surface conforming to the shape of the container received within said frame, manually operable valve means in said conduit, and said lever means being pivotable to draw the spaced apart ends of said adjacent pair of frame segments toward each other, whereby the area of the enclosed region provided by said frame is reduced to constrict said frame about the container for compressing said portion of said gasket and for puncturing the container by said hollow puncturing element to dispense fluid therefrom through said conduit upon opening said manually operable valve means.

References Cited in the file of this patent

UNITED STATES PATENTS

1,069,388	Colwell	Aug. 5, 1913
1,287,046	Knapp	Dec. 10, 1918
2,060,776	Bender	Nov. 10, 1936
2,303,625	Ellis	Dec. 1, 1942
2,350,205	Warfield	May 30, 1944

FOREIGN PATENTS

152,884	Austria	Mar. 25, 1938
---------	---------	---------------