

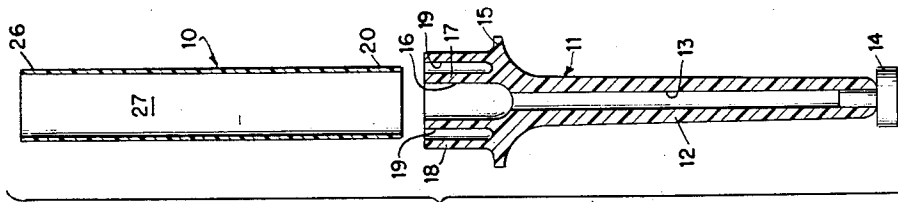
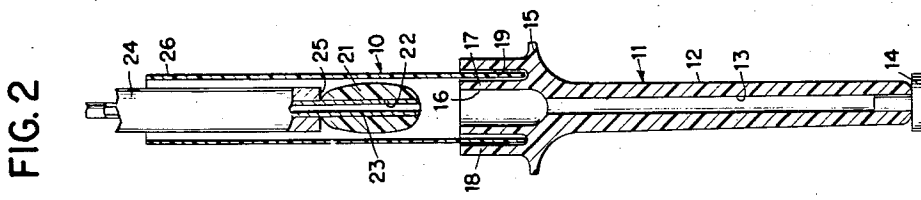
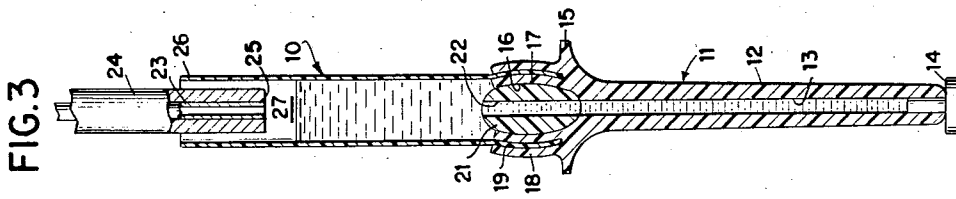
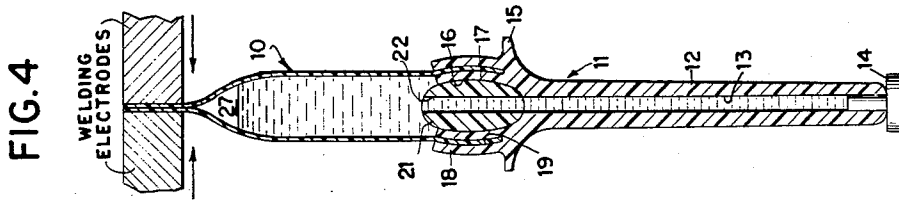
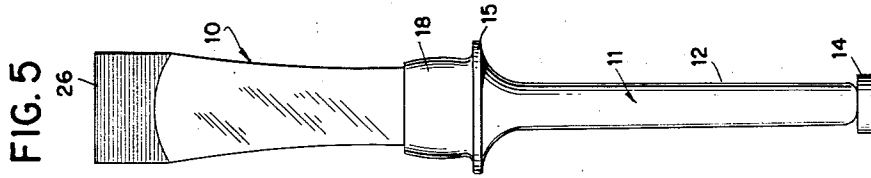
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COLLAPSIBLE CONTAINER PROVIDED WITH FLUID-TIGHT JOINT

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COLLAPSIBLE CONTAINER PROVIDED WITH FLUID-TIGHT JOINT

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My invention relates to containing and dispensing fluent materials, such as medicaments, lubricants and the like, and in particular provides a container-dispenser having a mechanical joint between a flexible tubular container member and a more rigid member, such as an applicator.

Of the more desirable materials for forming collapsible containers are the well known copolymers of vinylidene chloride and vinyl chloride. These materials can be made flexible and transparent and are relatively impermeable to most fluent materials. When, however, it is desired to construct a container which is attached to an applicator for dispensing a contained material, the applicator desirably is formed as a separate part since it must have greater thickness to impart a certain degree of rigidity. The amount of material required in forming the applicator portion of a container-dispenser, therefore, generally prohibits the use of vinylidene chloride-vinyl chloride copolymers, since the cost of such copolymers is relatively high as compared with materials, such as polyethylene. It is also relatively difficult to form particular shapes from the aforementioned copolymers and their desirable property of impermeability is not usually necessary in constructing the applicator portion of a container-dispenser.

Vinylidene chloride-vinyl chloride copolymers, however, are not readily joined to materials such as polyethylene, since the two types of materials have different fusing points and since most cements available for the purpose are generally soluble in the liquids which are typically to be contained and dispensed.

It is accordingly an important object of my invention to provide a fluid-tight mechanical seal which will securely hold a tubular body, such as a collapsible container, in a relatively more rigid member, such as an applicator for the container.

This and other objects of my invention are essentially obtained by providing the more rigid member at its end where it is to be joined to the tubular member with a cylindrical slot in the form of an annular space between a pair of cylindrical flanges. The slot is sized freely to receive the tubular open end of a container and then the flanges are forced together tightly, receiving the tubular end of the container by inserting a plug inside the inner flange to deform it outwardly.

For a more complete understanding of the principles of my invention, reference is made to the appended drawings in which:

FIGURE 1 is a longitudinal section through a typical tube and applicator before assembly;

FIGURE 2 is a view similar to FIGURE 1, showing the two parts positioned together prior to securing the mechanical joint between them;

FIGURE 3 is a view similar to the preceding figures, illustrating the mechanical seal between the members and a manner of filling the tubular member;

FIGURE 4 is a view similar to the preceding figures, illustrating sealing off the filled tubular container; and

FIGURE 5 is an elevation of a completed container.

Referring to the drawings, the reference numeral 10 indicates a cut length of flexible thin-walled tubular material, such as a vinylidene chloride-vinyl chloride copolymer, and the reference numeral 11 indicates a relatively thick-walled elongated applicator tube suitable for rectal insertion or the like.

It will be noted that applicator tube 11, which prefer-

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ably is formed of high-grade crystalline polyethylene, includes an elongated insertion tube 12 through which extends a narrow bore 13. At one end tube 12 is suitably stoppered by a plug 14, and at its other end tube 12 is flared outwardly to form a shoulder 15. On the opposite side of shoulder 15, bore 13 is enlarged as indicated at 16 and is defined by the inner wall of a cylindrical skirt 17. A second cylindrical skirt 18 is coaxially positioned about and spaced outwardly from inner skirt 17 such that the outer wall of inner skirt 17 and the inner wall of outer skirt 18 define a cylindrical recess 19 in the end of applicator 11 remote from plug 14. The dimensions of skirts 17 and 18 are arranged such that thin-walled tube 10 will pass freely into the recess 19. Thus the outside diameter of inner skirt 17 is less than the inside diameter of tubular member 10, and the inside diameter of outside skirt 18 is greater than the outside diameter of tubular member 10.

In order to fabricate a useful container-dispenser, the two pieces, tubular member 10 and applicator 11, are first positioned with one end 20 of tubular member 10 adjacent to recess 19 defined between skirts 17 and 18 of applicator 11. Suitably, plug 14 is emplaced in bore 13 of insertion tube 12 (see FIGURE 1).

Thereafter, end 20 of tubular member 10 is inserted into recess 19. A plug 21 of approximately oval longitudinal section and circular transverse section having a central longitudinal bore 22 is then inserted into the enlarged bore portion 16 of applicator 11 in the following manner.

A thin tube 23 is first inserted into bore 22 of plug 21, frictionally holding plug 21 on the end of tube 23. A sleeve 24 is then passed over tube 23 with its end 25 abutting plug 21. The assembly of plug 21, tube 23 and sleeve 24 are then inserted into the open end 26 of tubular member 10 (see FIGURE 2). As plug 21 reaches bore portion 16, sleeve 24 is reciprocated downwardly on tube 23, forcing plug 21 into bore portion 16 and off the end of tube 23.

It will be observed that the transverse dimensions of plug 21 near its center are substantially greater than the diameter of bore portion 16, that is, the inside diameter of inner skirt 17. Thus when plug 21 is forced into bore portion 16, plug 21 deforms skirt 17 near its center, forcing it outwardly a sufficient amount to receive the end 20 of tubular member 10 in tight contact and to expand end 20 into contact with the inner face of outer skirt 18 deforming the center of outer skirt 18 slightly (see FIGURE 3). It will be also noted that as so positioned, bore 22 of plug 21 registers with bore 13 of insertion tube 12, thus communicating the interior 27 of tubular member 10 with bore 13.

The seal thus formed between applicator 11 and tubular member 10 is so secure that in typical construction the amount of force required to pull tubular member 10 out of engagement with applicator 11 exceeds the tensile strength of the material from which tubular member 10 is formed. Also, the distance along the inner faces between the interior 27 of tubular member 10 through the joint against which sealing pressure is applied by plug 21 is sufficiently great to prevent leakage of even the most surface-active of materials.

Construction of the container-dispenser is then completed by withdrawing sleeve 24 and tube 23 together and while doing so metering into space 27 the desired quantity of material to be contained through tube 23 (also see FIGURE 3). Thereafter, end 26 of tubular member 10 is closed between a pair of electrodes in a radio frequency welding circuit. Radio frequency energy is then applied to heat the dielectric material forming tubular member 10 and weld flattened end 26 closed (see FIGURE 4).

The container-dispenser thus constructed (see FIG-

URE 5) is of course employed by removing plug 14, inserting tube 12 to a position to dispense the contents of the container where desired. The side walls formed by tubular member 10 between sealed end 26 and applicator 11 are then pressed together to eject the contents in space 27 through bore 22 and bore 13.

Although I have described my invention with reference to a particular container-dispenser construction, it will be evident that the joint described will be generally useful in securing a relatively more rigid piece on the end of a tubular member for almost any purpose where flow of a material is desired to pass through the sealed joint.

I claim:

1. A dispenser-container which includes a thin-walled flexible tubular container body sealed at one end thereof and open at the other end thereof, a relatively rigid discharge member for said container having an open ended discharge passageway therethrough, a first cylindrical skirt on said member surrounding an opening therein of said discharge passageway, a second cylindrical skirt on said member coaxially positioned about and spaced outwardly from said first skirt, said skirts defining between them a cylindrical recess in said member freely receiving said open end of said container body, a plug having a bore therethrough disposed inside said first skirt with said bore registering with said discharge passageway to communicate the interior of said container body with said passageway, said plug having a transverse dimension sufficiently great to maintain said first skirt deformed outwardly into contact with said open end of said container body to maintain said open end of said container body expanded into contact with said second skirt.

2. A dispenser-container which includes a thin-walled flexible tubular container body sealed at one end thereof and open at the other end thereof, a relatively rigid elongated discharge member for said container having a discharge passageway therethrough opening at each end of said member, a first cylindrical skirt on one end of said member surrounding the opening therein of said discharge passageway, a second cylindrical skirt on said one end of said member coaxially positioned about and spaced outwardly from said first skirt, said skirts defining between them a cylindrical recess in said one end of said member freely receiving said open end of said container body, an elongated plug having a bore formed lengthwise there-

through disposed inside said first skirt with said bore registering with said discharge passageway to communicate the interior of said container body with said passageway, said plug having a transverse dimension sufficiently great to maintain said first skirt deformed outwardly into contact with said open end of said container body to maintain said open end of said container body expanded into contact with said second skirt.

3. A dispenser-container which includes a thin-walled flexible tubular container body constructed of vinylidene chloride-vinyl chloride copolymer, said container body being sealed at one end thereof and open at the other end thereof, a relatively rigid elongated discharge member for said container constructed of crystalline polyethylene, said discharge member having a discharge passageway therethrough opening at each end of said member, a first cylindrical skirt on one end of said member surrounding the opening therein of said discharge passageway, a second cylindrical skirt on said one end of said member coaxially positioned about and spaced outwardly from said first skirt, said skirts defining between them a cylindrical recess in said one end of said member freely receiving said open end of said container body, an elongated plug having a bore formed lengthwise therethrough disposed inside said first skirt with said bore registering with said discharge passageway to communicate the interior of said container body with said passageway, said plug having a transverse dimension sufficiently great to maintain said first skirt deformed outwardly into contact with said open end of said container body and to maintain said open end of said container body expanded into contact with said second skirt.

References Cited in the file of this patent

UNITED STATES PATENTS

560,984	Funk	May 26, 1896
1,185,215	Lezzeni	May 30, 1916
1,977,917	Norgren	Oct. 23, 1934
2,071,478	Wick	Feb. 23, 1937
2,072,366	Hein	Mar. 2, 1937
2,258,919	Wallace	Oct. 14, 1941
2,374,225	Melsom	Apr. 24, 1945
2,614,827	Peach et al.	Oct. 21, 1952