SEALANT CONTAINERS AND DISPENSERS

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ABSTRACT OF THE DISCLOSURE

There is disclosed herein a container for viscous material adapted for dispensing the material therefrom by means of fluid pressure. There is further disclosed a support for receiving the container and spout means for penetrating the container to release the material.

This invention relates to containers for sealants, adhesives, lubricants, inks, and other viscous materials and to dispensing means therefor.

In the present invention, the container is utilized for packaging, shipping, and storing the viscous material and is adapted to be mounted to a support for dispensing the material under fluid pressure. The dispensing end of the container is provided with closure means adapted to be perforated or penetrated by a spout member whereby the material can be dispensed in a controlled stream or ribbon. The opposite end of said container is provided with an impellent member which is slidable axially within the container when fluid pressure is applied thereto whereby the material is forced from the dispensing end.

The present invention is adapted to be actuated by compressed air which is commonly available in shops and factories or may be provided by portable compressors or compressors mounted on motorized vehicles. It will be readily understood, however, that other pressurized fluid may be used if desired.

An object of the invention is to provide an improved container for viscous material which is both a packaging means and part of a dispensing means for the material.

Another object of the invention is to provide an improved support means for receiving the container and dispensing the material therefrom.

Still another object of the invention is to provide means for mounting a dispensing spout to the container which automatically penetrates the container to release the material therefrom.

Yet another object of the invention is to provide an improved support means for receiving the container, applying fluid pressure thereto, and automatically perforating the dispensing end thereof.

A further object of the invention is to provide an improved container having means for attaching fluid pressure means and nozzle means directly thereto.

A still further object of the invention is to provide improved container and dispensing means for viscous material which is simple in construction, comprised of few parts, inexpensive to manufacture, and highly efficient and durable in use.

Other objects of the invention and the invention itself will become more readily apparent from the following description and the accompanying drawings, in which said drawings:

FIGURE 1 is a perspective view of a sealant container and support therefor, the support being shown rotated to a different operative position in broken lines;

FIGURE 2 is an enlarged horizontal section taken generally along the line 2—2 of FIGURE 1, the central portion of the container and support being cut away;

FIGURE 3 is an enlarged side plan view of the support of FIGURE 1, portions thereof being cut away;

FIGURE 4 is an enlarged fragmentary perspective of a rear end portion of a nozzle adapted to penetrate the container of FIGURE 2;

FIGURE 5 is an enlarged fragmentary section of the dispensing end portion of the container of FIGURE 1;

FIGURE 6 is a fragmentary section similar to FIGURE 5 showing a modified dispensing end portion for the container;

FIGURE 7 is a fragmentary section similar to FIGURE 5 showing still another modified dispensing end portion for the container;

FIGURE 8 is a view similar to FIGURE 5 showing yet another modified dispensing end portion and a modified support and nozzle;

FIGURE 9 is a side plan view, partially in longitudinal section, of a modified container having means for attaching both a nozzle and fluid pressure means directly thereto; and

FIGURE 10 is a view similar to FIGURE 9 of another modified container having means for attaching both a nozzle and fluid pressure means directly thereto.

Referring now to the drawings in all of which like parts are designated by like reference numerals and referring particularly to FIGURES 1—4, a sealant dispenser is generally shown at 10 comprising a cylindrical container 11 which may be made of any suitable material but as herein illustrated is preferably made of a thermoplastic synthetic resin. The container 11 has a plastic end cap 12 at its forward, dispensing end and has an open portion at its rearwardly directed end adapted to receive connected to a front spout carrier 14 by means of a pair plugging member 13 adapted to fit snugly within said rearward end of the container. The coupling member 13 is connected to a front spout carrier 14 by means of a pair of elongated struts 15 disposed at diametrically opposite positions on either side of the container and connected at the ends thereof to said coupling member and said carrier.

As shown in FIGURE 2, a circular impellent member 16 is recessed within the rearwardly directed end portion of the container 11 to provide space for insertion of the coupling member 13 and to retain viscous sealing material 17 within the container 11. The impellent member 16 is also preferably made of plastic and comprises a circular wall 18 having a rearwardly directed, circumferential flange 19 adapted to snugly but slidably fit within the container 11. The end cap 12 comprises a circular end wall 20 having a rearwardly directed, circumferential flange 21 disposed over the forward end portion of the container 11. The flange 21 is preferably secured to the container by spin welding the same to the container in a well-known manner.

The coupling member 13 as herein illustrated is a metallic, cup-shaped member having a circular end wall 24 and a rearwardly projecting peripheral flange 25 adapted to fit tightly within the open, rearwardly directed end of the container 11 behind the impellent member 16. A pressure fluid valve 26 having a manual operating member 27 is mounted centrally in the end wall 24 and has a rearwardly projecting male hose fitting 28 whereby the same is adapted to be coupled with a pressure fluid carrying hose (not shown).

The spout carrier 14 as herein shown is also a metallic cup-shaped member having an end wall 31 and a forwardly directed peripheral flange 32 having an inturnd lip 33 at its forwardly directed edge. The end wall 31 is centrally apurated at 34 and its forwardly directed surface carries an internally threaded nut 35 welded or otherwise suitably secured to said end wall 31. The nut 35 is adapted to receive a spout 36 which comprises a tubular nozzle portion 37 and a tubular, externally threaded coupling 38 a portion of which is fitted within the nozzle.
portion 37 and the rearwardly directed end of which is thread fitted into the nut 35.

The elongated struts 15 are preferably made of heavy gauge metal wire having right angularly turned end portions 40 and 41 which project inwardly through parallel diametrically opposite apertures 32 and 25' in the flanges 20 and 20' of the spout carrier 14 and coupling members 13, respectively. The inner ends of the intumed portions 40 and 41 are flattened as shown at 42 and 43, respectively, whereby said intumed end portions cannot be removed from the coupling member and spout carrier.

As best seen in FIGURE 3, the coupling member 13 and spout carrier 14 and their associated parts connected together by the struts 15 provide a detachable carrier for receiving the container 11, said support being generally designated by the numeral 50. The container 11 is preferably provided separately to the user, preloaded with the sealing material 17, whereby the user can mount the same to a support 50 for dispensing the material.

As shown in FIGURE 5, the end wall 20 is initially unperforated, its center portion being reduced in thickness as indicated at 20' to provide a placeable portion whereby the wall can be perforated for dispensing the material 17. A container 11 is mounted to the support 50 by first inserting the coupling member 13 into the rearwardly directed end portion of the container with the spout carrier 14 pivoted to one side of said container. The coupling member 13 is inserted into the container as far as possible after which the spout carrier 14 and struts 15 are pivoted downwardly from the broken line position to the full line position of FIGURE 1. The longitudinal dimension of the container 11 is preferably such that the spout carrier 14 can be slid across and into coaxial alignment with the end cap 12 under moderate pressure. As shown in FIGURES 2 and 3, the rearwardly directed end of the externally threaded coupling 38 extends rearwardly beyond the end wall 31 of the spout carrier, the rearwardly directed extremity thereof being frusto-conical in shape and being cut transversely at an oblique angle relative to the axis of the spout to provide a penetrating end portion 52 adapted to dislodge the placeable portion 20' of the end cap 12. It will be readily seen that when pressure fluid is applied behind the end closure member 16 by actuation of the valve 26, the entire cylindrical container 11 will be first pushed forwardly whereby the wall 20 of the end cap 12 is pressed tightly against the end wall 31 of the spout carrier 14 thus causing the penetrating end portion 38 to dislodge the placeable portion 20'. The forward movement of the container 11 is not sufficient to unseat the coupling member 13 or to cause leakage of air pressure whereby further application of pressure behind the impellent member 16 will force the sealing material or other viscous material from the container through the coupling 38 and the nozzle portion 37.

From the foregoing it will be seen that the present invention provides a container for packaging, shipping and storing a viscous material, such as a sealant, whereby the container can be quickly and readily assembled with a support to provide means for directing fluid pressure behind the viscous material and automatically punctures the dispensing end of the container by pressure against the spout.

FIGURES 6 and 7 show alternate means of providing a perforable end wall for the container 11. FIGURE 6 shows an end cap 54 of the type shown at 12, said cap 54 having a circular end wall 55, an externally placed, circumferential flange 56. The end wall 55 has a central aperture 57 into which is positioned an integral, preferably soft, rubberlike plug 58 having an enlarged head 59 disposed inwardly of the container and a small outer peripheral lip 60 disposed outwardly of the container. In this embodiment, the penetrating end portion 52 simply punches the plug 68 on through the aperture 57 and into the container thereby opening up said aperture for dispensing the sealant or other viscous material. In FIGURE 7, the modified container 11' is provided with a sheet metal end closure 62 having a peripheral edge 63 crimped over the forwardly directed end of said container 11'. The circular, central portion of the end closure is upset inwardly as indicated at 64 whereby there is provided a central, peripherally weakened, placeable portion in the center of the sheet metal disc. In a modification of FIGURE 8, a cylindrical container 11 is provided with a modified, plastic end cap 66 having a rearwardly directed flange 68 disposed outwardly of the container. The externally threaded end portion 75 is adapted to be thread fitted into the boss 69 from the forward end of the container. The externally threaded end portion 75 is of such length that by threading it all the way into the boss 69, the cap plug 71 can be dislodged from said boss and pushed on into the container thereby unsealing the container and allowing the sealant to be discharged therefrom.

In the forms of the invention shown in FIGURES 9 and 10, separate supports such as shown at 50 are not needed. In the form of FIGURE 9, a cylindrical container 80 made of a plastic or other suitable material is provided with closure members 81 at either end thereof. Each closure member 81 comprises an end wall 82 having an axially directed peripheral flange 83 and a central boss 84 projecting in the same direction as said flange. The closure members 81 are adapted to fit inside the container 80 with the flanges 83 and bosses 84 directed outwardly of the container in an axial direction. At the forward or dispensing end of the container which is shown in the left FIGURE 9, the inner end of the internally threaded boss 84 is provided with a rubberlike plug of the type shown at 71 in FIGURE 8. Adjacent to the opposite end of the container 80, an impellent member 16 is disposed inwardly of the right-hand closure member 81 whereby the sealant is contained between said end impellent member 16 and the left-hand closure member 81.

A spout 74 is adapted to be threaded into the boss 84 whereby it pushes the plug 71 inwardly of the container to release the sealant therefrom. The internally threaded boss of the right-hand closure member 81 in FIGURE 9 serves as a connection means adapted to receive fluid pressure through a fitting 85 shown in broken line. The closure members 81 are secured to the container 80 and are prevented from being blown outwardly therefrom when the pressure fluid is introduced by end portions 86 thereof which are rolled inwardly over the axially directed edges of the flanges 83.

The modification shown FIGURE 10 shows a container 90 of cylindrical form having a pair of closure members 91 of substantially the same form as those shown at 81 in FIGURE 9. FIGURE 10 shows a rearwardly directed end wall 92, an axially outwardly directed peripheral flange 93, and an axially outwardly directed boss 94. The closure members 91 differ from the closure members 81 in that they have additional external threads on the boss as indicated at 95. The cylindrical container 90 differs from the container 80 in that the axially directed edges thereof
are not rolled over the outwardly directed edges of the flanges 93. Instead, the embodiment of FIGURE 10 is provided with at least two elongated struts 96 having inwardly directed edges which are turned outwardly over the edges of the container and the flanges 93. Thus, the closure members 91 are held against blowing outwardly from the end of the container when fluid pressure is applied at the rearward or right-hand end behind the end closure member 16. The external threads 95 afford connection means for attaching an internally threaded fitting 98 at the right-hand end of the container as shown in broken lines.

From the foregoing, it will be seen that the present invention provides simple and effective means for using the package or container as a dispensing device for viscous materials and that it also provides simple and effective means for perforating and penetrating the forward or dispensing end of a container.

It will be understood that many changes in the details of the invention as herein described and illustrated may be made without, however, departing from the spirit thereof.

What I claim is:

1. Dispensing means for dispensing viscous material comprising an elongated, hollow container having a normally open rearward end and a forward, dispensing end, an end closure closing said dispensing end; an impellent member disposed within said container adjacent to said rearward end; a fluid pressure coupling telescoped into the rearward end of said container in substantially airtight relation thereto behind said impellent member; said coupling member having connector means adapted to extend forwardly along the sides of said container; a carrier member carried by the forward end of said connector means for seating over said end closure member; said coupling member being movable a short distance in the axial direction while maintaining substantially airtight relation with said container; said coupling adapted to be connected to a pressure fluid source for supplying fluid pressure behind said impellent member to force said material toward said dispensing end; said end closure having a replaceable portion adapted to afford a dispensing opening through said end closure upon dislodgement of said replaceable portion; a spout carried by said carrier member having a rearwardly directed penetrating end portion extending rearwardly beyond said carrier a short distance whereby when fluid pressure is applied behind said impellent member, said container shifts forwardly thereby causing said penetrating end portion to dislodge said replaceable portion whereby said material is displaced through said end closure and said spout.

2. Dispensing means as set forth in claim 1, said closure member having an aperture therein; said replaceable portion comprising a plug disposed in said aperture, said plug being removable inwardly of said container whereby pressure from said penetrating end portion dissolves said plug to allow said material to flow through said aperture and said spout.

3. Dispensing means as set forth in claim 1, said carrier and said end closure having walls disposed transverse to the axies of said carrier and said container, respectively; said replaceable portion disposed substantially in the plane of the wall of said container and normally blocking the flow of material therethrough; said penetrating end portion projecting rearwardly beyond the plane of the wall of said carrier; said walls coming into flatwise contact upon application of fluid pressure to said container whereby said penetrating end portion is forced against said replaceable portion to dislodge said replaceable portion from said end closure.

4. Dispensing means as set forth in claim 3, said replaceable portion comprising an area of substantially reduced thickness in the wall of said end closure member whereby pressure from said penetrating end portion perforates said wall of said end closure member to allow said material to flow through said spout.

5. Dispensing means for dispensing viscous material comprising an elongated, hollow container having a forward, dispensing end; an end closure member closing said dispensing end; an impellent member disposed within said container adjacent to the rearward end thereof; fluid pressure connection means disposed within the rearward end of said container behind said impellent member; said connection means adapted to be connected to a pressure fluid source for supplying fluid pressure behind said impellent member to force said material toward said dispensing end; said end closure member having a replaceable portion adapted to afford a dispensing opening through said end closure member upon dislodgement of said replaceable portion; said container comprising a cylindrical tube having a normally open rearward end portion; said impellent member being disposed inwardly from the rearward end of said container; said fluid pressure connection means comprising a cylindrical coupling adapted to be telescoped into the rearwardly directed end of said container in substantially airtight relation thereto; said coupling member having connector means adapted to extend forwardly along the sides of said container; a carrier member carried by the forward end of said connector means for seating over said end closure member; a spout carried by said carrier member and having a rearwardly directed penetrating end portion extending rearwardly beyond said carrier a short distance whereby when fluid pressure is applied behind said impellent member, said container shifts forwardly thereby causing said penetrating end portion to dislodge said replaceable portion whereby said material is displaced through said end closure and said spout; said carrier and said end closure member having walls disposed transverse to the axies of said carrier and said container, respectively; said replaceable portion disposed substantially in the plane of the wall of said end closure and normally blocking the flow of material therethrough; said penetrating end portion projecting rearwardly beyond the plane of the wall of said carrier; said walls coming into flatwise contact upon application of fluid pressure to said container whereby said penetrating end portion is forced against said replaceable portion to dislodge said replaceable portion from said end closure member; said wall of said end closure member having an aperture therein; said replaceable portion comprising a plug disposed in said aperture, said plug being removable inwardly of said container whereby pressure from said penetrating end portion dissolves said plug to allow said material to flow through said aperture and said spout.

6. Dispensing means as set forth in claim 5, said plug being made of resilient material having an enlarged portion disposed inwardly of said container and a small outer peripheral lip disposed outwardly of said container.

7. Dispensing means as set forth in claim 3, said replaceable portion comprising an area of said wall of said end closure member which is recessed inwardly from the remainder of said wall to provide a reduced, peripheral connecting edge around said replaceable portion whereby pressure from said penetrating end portion perforates said wall of said end closure member to allow said material to flow through said spout.

8. Dispensing means for dispensing viscous material comprising an elongated, hollow container having a forward, dispensing end; an end closure member closing said dispensing end; an impellent member disposed within said container adjacent to the rearward end thereof; fluid pressure connection means disposed within the rearward end of said container behind said impellent member; said connection means adapted to be connected to a pressure fluid source for supplying fluid pressure behind said impellent member to force said material toward said dispensing end; said end closure member having a displacement...
able portion adapted to afford a dispensing opening through said end closure member upon dislodgment of said disposable portion; a detachable spout adapted to be mounted to said end closure; said spout having means dislodging said disposable means when said spout is mounted to said end closure whereby a dispensing material can be dispensed through said spout; said end closure member having an inwardly projecting, internally threaded boss affording an opening through said end closure member; said disposable portion comprising a plug projecting into the inner end of said boss and extending only part way through said boss; said spout having an externally threaded end portion adapted to be screw-thread fitted into said boss from the outside of said container whereby the distal end of said threaded end portion dislodges said plug to allow said material to be dispensed through said spout.

Dispensing means for dispensing viscous material comprising an elongated, hollow container having a forward, dispensing end; an end closure member closing said dispensing end; an impellent member disposed within said container adjacent to the rearward end thereof; fluid pressure connection means disposed within the rearward end of said container behind said impellent member; said connection means adapted to be connected to a pressure fluid source for supplying fluid pressure behind said impellent member to force said material toward said dispensing end; said end closure member having a disposable portion adapted to be dislodged from said end closure member upon dislodgment of said disposable portion; a detachable spout adapted to be mounted to said end closure; said spout having means dislodging said disposable portion when said spout is mounted to said end closure whereby said material can be dispensed through said spout; said container comprising a cylindrical tube; said end closure member and connection means being cup-shaped and each comprising a circular end wall, an axially directed, peripheral flange at the outer edge of said end wall, and a central boss projecting the same axial direction as said flange, said end closure member and connection means being telescopically fitted within end portions of said container with the flanges thereof directed outwardly parallel to the axis of the container; each said boss being internally threaded and affording a through opening into said container; said disposable portion comprising a plug projecting into the inner end of the opening in said end closure member and extending only part way through said opening; a spout having an externally threaded end portion adapted to be screw-thread fitted into said opening from the outside of said container whereby the distal end of said threaded end portion dislodges said plug to allow said material to be dispensed through said spout; and means retaining said end closure member and said connection means within the ends of said container comprising end edge portions of said container rolled inwardly over the axially directed edges of said flanges.

Dispensing means as set forth in claim 9, said means retaining said end closure member and said connection means within the ends of said container comprising a plurality of elongated struts disposed along the sides of the container parallel with the axis thereof; said struts having inwardly turned, hooked end portions turned over the axially directed edges of said flanges.

Dispensing means as set forth in claim 9, the boss carried by said connection means being externally threaded whereby it is adapted to receive either a male or female type pressure fluid attachment means.

A container for packaging viscous material for subsequent dispensing of the material, said container being hollow and of elongated, cylindrical form and having a forward, dispensing end; an end closure member closing said dispensing end; an impellent member disposed within said container adjacent to the rearward end thereof; fluid pressure connection means disposed within the rearward end of said container behind said impellent member; said connection means adapted to be connected to a pressure fluid source for supplying fluid pressure behind said impellent member to force said material toward said dispensing end; said end closure member having a disposable portion adapted to afford a dispensing opening through said end closure member upon dislodgment of said disposable portion; said disposable portion adapted to be dislodged when pressure is applied thereto from outside said container; said container being made of a thermoplastic synthetic resin; said end closure member comprising an end cap having a peripheral flange telescoped over and spin welded to the forward end of said container; said end cap having a substantially flat wall disposed transverse to the axis of the cap and container; said wall having an aperture therein; said disposable portion comprising a plug disposed in said aperture, said plug being removable inwardly of said container whereby pressure applied thereto from outside said container dislodges said plug to allow said material to be dispensed.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,504,826

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It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 31, "connected to a front spout carrier 14 by means of a pair" should read -- fluid pressure connection means in the form of a coup- --.

Signed and sealed this 29th day of December 1970.

(SEAL)

Attest:

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Commissioner of Patents