Jan. 16, 1968 W. J. GEIST, SR 3,363,811

CONTAINER WITH FRANGIBLE SEAL FOR EXTRUDABLE MATERIALS

Filed June 28, 1965

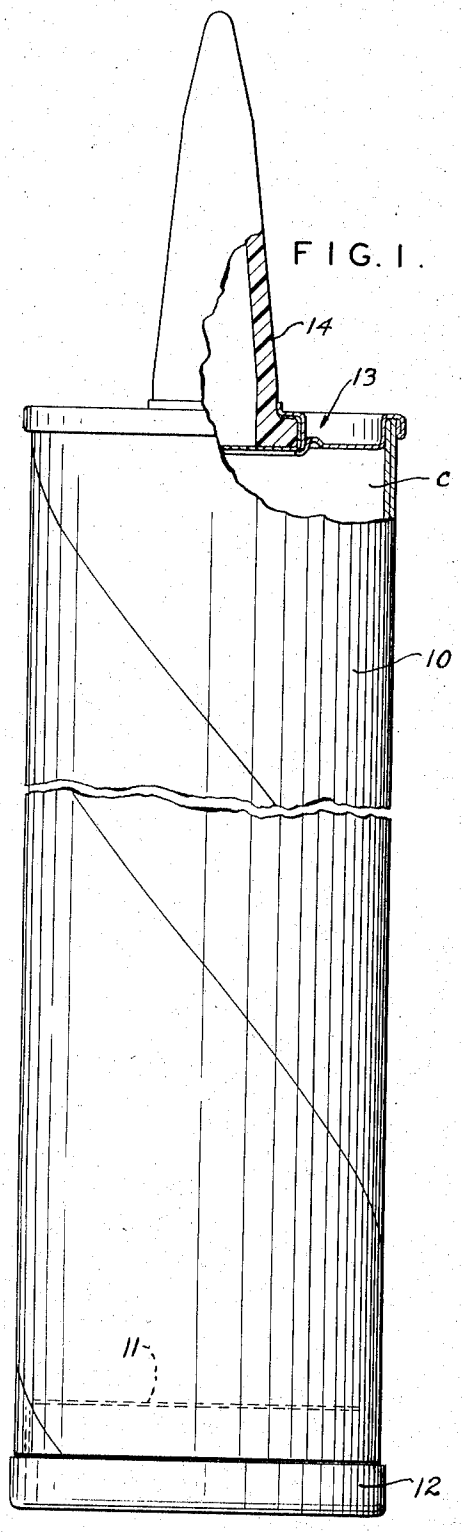


FIG. 1.

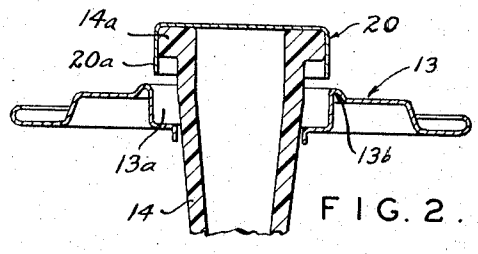


FIG. 2.

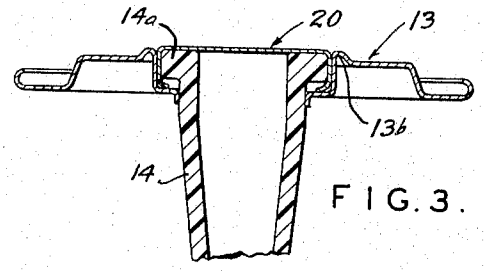


FIG. 3.

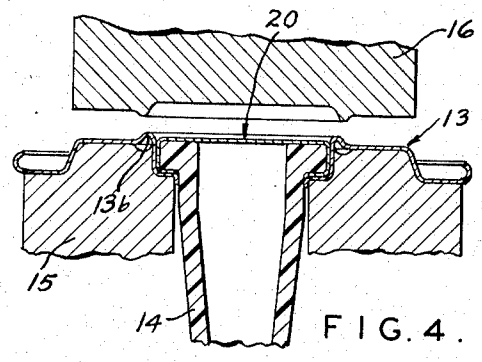


FIG. 4.

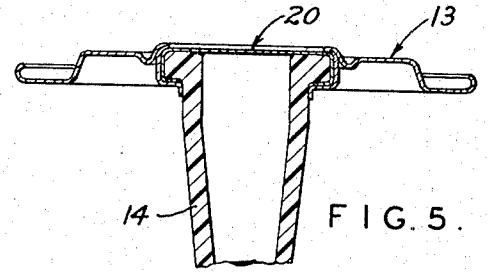


FIG. 5.

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CONTAINER WITH FRANGIBLE SEAL FOR EXTRUDABLE MATERIALS

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1 Claim. (Cl. 222—541)

This invention relates to a container with a frangible seal and is an improvement over the invention disclosed and claimed in an application S.N. 467,195, filed June 28, 1965, and executed by me of even date herewith and entitled, "Container for Extrudable Materials."

The above identified copending application discloses and claims a novel and improved spout section and end closure assembly and the present invention constitutes an improvement thereon wherein a frangible membrane is incorporated into the metal end closure and spout assembly to initially seal off the opening at the inner end of the spout section but being breakable to permit extrusion of the plastic material through said section confined within the container when pressure is applied thereto.

It has been found that many extrudable materials such as caulking compounds harden when exposed to even relatively small amounts of air. Since the spouts of such cartridges are frequently constructed of materials such as polyethylene which are not good gas barriers, it is necessary to seal off the inner end of the spout at the opening through the flange thereon in order to prevent air contact during storage of the filled containers. The use of a frangible membrane such as an aluminum foil sealing element is well known in the art and such a membrane is disclosed in Galbierz et al. Patent No. 3,071,294, assigned to the assignee of the present invention and application. As disclosed in Galbierz the membrane can be constructed to be broken under the pressure of extrusion or can be broken by some other means. However, the construction of the present invention is believed to be entirely new and different and provide a greatly improved container for the extrudable materials which provides an improved sealed connection between the spout section and the metal end closure which is capable of efficient and inexpensive manufacture.

The present invention relates to a new combination and constitutes a metal end closure designed in a similar manner to the end closure described in my above identified copending application and having a flanged spout section inserted therethrough with the flange being received in a recess provided in the end closure and specifically including a frangible sealing membrane covering the inner end of the flanged spout or nozzle section and extending around the flange to be securely clamped between the flange and the surrounding area of the end closure which forms the recess in which the flange is received. The frangible membrane is sufficiently soft to form a gasket between the flange and the metal surfaces surrounding the same when the flange is positively crimped in seated position within the recess so that the frangible membrane not only closes the inner end of the spout or nozzle but also serves to provide an improved seal between the spout flange and the portion of the metal end forming the recess.

It is an object of the present invention to provide a novel and improved end closure and spout assembly which includes a frangible sealing membrane covering the inner end of the spout section and which is positively held in place around the inner end of the spout without requiring any additional sealing means.

It is another object to provide a novel container with a frangible seal for extrudable plastic-like materials.

It is still a further object to provide a highly efficient assembly which includes a metal end closure having a recess surrounding an opening therethrough with a hollow nozzle or spout section inserted through the opening and having an attachment flange seated in said recess with a frangible membrane covering the inner end of the flange to close the same and surrounding the flange to be positively clamped in sealed relation between the flange and the surfaces of the end closure forming said recess.

These and other objects and advantages will more fully appear in the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

FIG. 1 is a front elevational view partially broken away showing a container embodying my invention,

FIG. 2 is a longitudinal central sectional view of the spout and end closure unit with the spout partially inserted into operative position in the metal end and showing the frangible membrane mounted thereon,

FIG. 3 is a similar view to FIG. 2 showing the lower skirt portion of the membrane partially curled under the flange with the flange disposed in slightly spaced relation above the bottom of the recess,

FIG. 4 is a view showing the flange in seated position within the recess of the end closure and the membrane encircling the flange and showing the entire unit in a punch type clinching die assembly prior to the operation of the die, and in final assembled position with the sealing membrane positively clamped around the flange of the spout.

In this improved invention I provide a container body in tubular form designated by the numeral **10**, an extrudable material such as caulking compound C is confined within the tubular body **10** and a plunger **11** is mounted in one end of the body with a peripheral skirt disposed in close fitting relation therewithin. A suitable closure may be provided for one end of the tube such as the cap **12**. The other end of the tube has a metal end **13** crimped or seamed thereon and a hollow spout section **14** having an attachment flange **14***a* is mounted in the end closure in a manner to be described. A frangible membrane **20** extends across the inner open end of the spout and has a skirt portion **20***a* which surrounds the flange **14***a* formed on the inner end of said spout. Any suitable material which will form a positive air-tight seal across the inner end of the spout **14** during packing, shipping and storage but which can be broken to permit extrusion of the material C confined within the container would, of course, be satisfactory for the membrane **20**. A metallic foil such as aluminum or some form of readily rupturable plastic sheet such as a material known as "Saran" has been found to be suitable and also such materials have the advantage of retaining the preformed shape around the flange at the inner end of the spout prior to the flange being seated in the recess.

After the membrane **20** has been formed around the flange as shown in FIG. 2 the spout section **14** is inserted through the opening provided in the end closure member **13** until the flange **14***a* is seated in the recess **13***a* provided around said opening. The skirt **20***a* of the membrane completely surrounds the outer circumferential portion of the flange and is sufficiently long to extend downwardly beyond the flange and underly the same when seated in the recess and thereby become tightly clamped under said flange when the same is in seated position, as best shown in FIG. 4.

When the pre-assembled flange **14***a* and membrane **20** are seated within the recess **13***a* of the end closure **13** the entire end closure and spout assembly is mounted in

the locating block 15 of the clinching die as best shown in FIG. 4 and the clinching punch 16 is moved downwardly to clamp the upwardly extending ring 13*b* around the circumferential portion of the flange 14*a* as best shown in FIG. 5 to positively hold the frangible sealing membrane 20 in sealing position and prevent leakage of air or material not only through the hollow nozzle section 14 but also between the flange 14*a* and metal end closure 13, the membrane forming a breakable sealing closure as well as a gasket.

In order to put the container into operation, any suitable means for applying extrusion force to the plunger 11 may be provided such as a conventional caulking gun which is designed to forcibly project said plunger through the hollow body of the container. As in the case of the one-piece spout illustrated in the accompanying drawings, the outer end of the spout is initially cut off at the desired length which governs the size of the discharge opening at the end thereof, and pressure is then applied to said plunger as previously stated. When the frangible sealing membrane is broken the extrudable material is forced through the nozzle and the open end thereof.

It will be seen that I have provided a container for extrudable materials which incorporates a novel and easily manufactured spout and closure assembly for the discharge end of the tube which includes a frangible membrane extending across the inner end of the spout and positively attached thereto by a novel and efficient method of manufacturing.

It will, of course, be understood that various changes may be made in the form, detail, arrangement and proportion of the parts without departing from the scope of my invention which generally stated consists in the matter set forth in the appended claim.

What is claimed is:

1. A cylindrical container particularly designed for confining and dispensing under pressure plastic extrudable materials and provided with a frangible membrane for preventing leakage of the material into the spout until the same is to be dispensed under pressure,

(a) said container comprising a hollow cylindrical body member, having a body wall impervious to the material to be confined therein and dispensed therefrom,

(b) a one-piece unitary metal closure member having

(1) an outer circumferential crimping portion tightly clamped around the outside of one end of said body, and

(2) an annular groove defined by a pair of radially spaced-apart wall segments,

(a) the outer wall forming a crimp back-up wall received within the end portion of the container body wall against which the crimping portion is circumferentially clamped,

(b) the inner wall segment defining a flange receiving recess spaced inwardly from the inside surface of said body wall and having a spout receiving opening through the recess

portion, the diameter of said opening being less than the inside diameter of said recess to provide a flange-receiving seat, said recess extending outwardly in an axial direction of the plane defined by the inside surface of the portion of the closure member forming said annular groove,

(c) a hollow spout section having a sealing and retaining flange on the inner end thereof,

(1) said flange being of substantially the same diameter as the inside diameter of said recess,

(d) a frangible membrane covering the inner end of said spout flange and surrounding the flange, said membrane being of a material to be broken to permit extrusion of the plastic material through said spout,

(e) said spout section being inserted through the opening of said closure with the flange and surrounding portion of the membrane seated in close fitting relation in said recess to tightly clamp said membrane in wrapped relation around said flange and closing the opening at the inner end of the spout section,

(f) the inner surface of said flange with the membrane thereacross lying substantially in the plane of said inner closure surface,

(g) the portion of said metal closure defining said recess and surrounding said flange being of a type and shaped to provide a double thickness clamping ring in an intermediate portion thereof and clamped around the circumferential marginal portion of said flange and membrane to positively hold the same in seated sealed relation within said recess,

(h) the portion of said closure recess surrounding said opening engaging said flange and membrane and positively restraining said spout during extrusion of the material therethrough,

(i) said clamping ring positively restraining said spout when inwardly directed pressure is applied thereto during contact with a solid surface and also maintaining the sealed relation between the closure and the engaged inner flange and membrane surface, and

(j) a plunger slidably mounted in said body member for forcibly extruding material through said spout.

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