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3,029,987

SPOUT WITH FRANGIBLE DIAPHRAGM FOR CAULKING CARTRIDGE

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Fig. 1

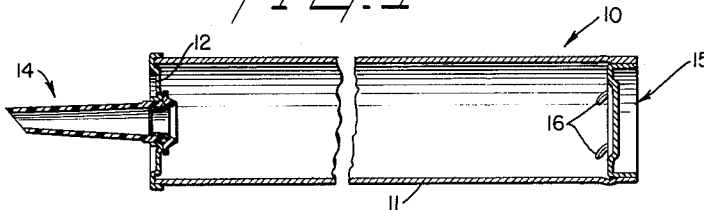


Fig. 2

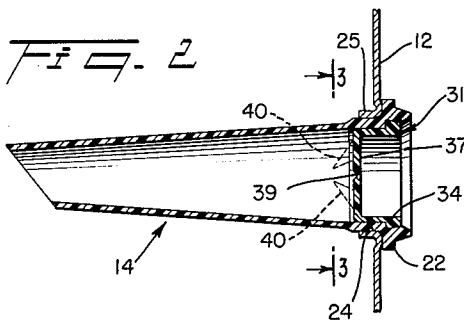


Fig. 3

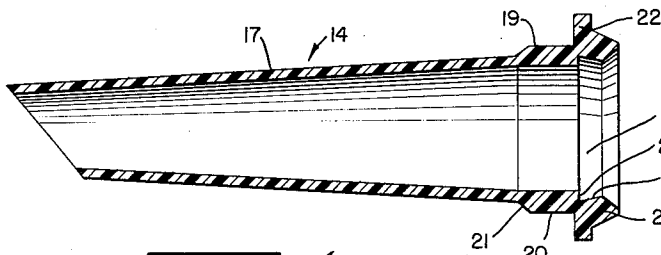
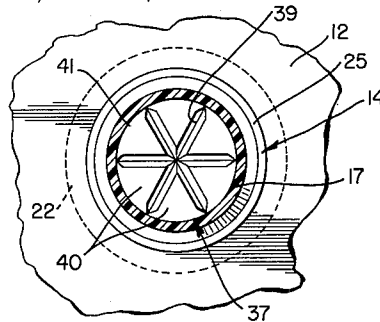


Fig. 4

Fig. 5

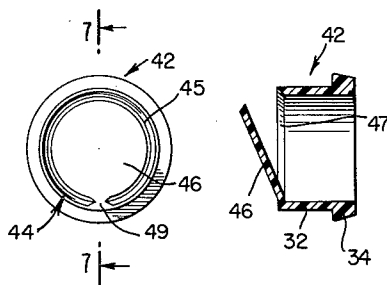
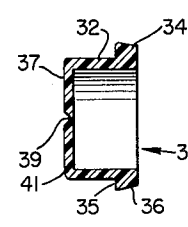


Fig. 6

Fig. 7

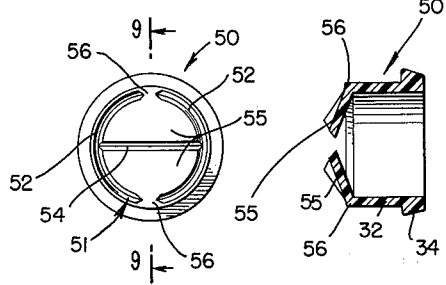


Fig. 8

Fig. 9

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SPOUT WITH FRANGIBLE DIAPHRAGM FOR CAULKING CARTRIDGE

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10 Claims. (Cl. 222-541)

This invention relates to cartridges for dispensing and applying plastic material, such as caulking compounds, putty, heavy greases, and the like. The invention has among its objects the provision of an improved cartridge of the type indicated which maintains the contents of the cartridge sealed from the atmosphere until it is desired initially to dispense plastic material therefrom.

A further object of the invention is to provide a cartridge for dispensing and applying plastic material having a frangible seal at its forward, dispensing end, the seal being of such character that, when broken, there is no possibility of parts of the seal becoming detached and entrained in the plastic material being dispensed.

Yet another object of the invention lies in the provision of an improved combined spout and seal for a cartridge of the type indicated, the spout and seal being easily and economically made and assembled.

The above and further objects and novel features of the invention will more fully appear from the following description when the same is read in connection with the accompanying drawings. It is to be expressly understood, however, that the drawings are for the purpose of illustration only, and are not intended as a definition of the limits of the invention.

In the drawings, wherein like reference characters refer to like parts throughout the several views,

FIG. 1 is a view in longitudinal axial cross section through an illustrative embodiment of cartridge made in accordance with the present invention;

FIG. 2 is an enlarged view in longitudinal axial section through the dispensing spout and seal of the cartridge of FIG. 1;

FIG. 3 is a fragmentary view in transverse section through the spout, the section being taken along line 3-3 of FIG. 2;

FIG. 4 is a view in longitudinal axial section on a still larger scale through the spout of the illustrative cartridge;

FIG. 5 is a view in longitudinal axial section, on the same scale as FIG. 4, of the sealing insert adapted to be assembled with the spout of FIG. 4 to form a seal and spout assembly shown in FIGS. 1, 2, and 3;

FIG. 6 is a view in end elevation of a second, alternative, sealing insert which may be employed with the spout of FIG. 4;

FIG. 7 is a view in longitudinal axial section through the insert of FIG. 6, the section being taken along the line 7-7 of FIG. 6;

FIG. 8 is a view in end elevation of a third, alternative, sealing insert which may be employed with the spout of FIG. 4; and

FIG. 9 is a view in longitudinal axial section through the sealing insert of FIG. 8, the section being taken along the line 9-9 of FIG. 8.

The dispensing cartridge of the present invention represents an improvement upon those in which the cartridge has been initially sealed by the provision of a thin frangible plastic film disposed across the passage through the dispensing spout of the cartridge and retained therein by a sleeve telescoped into the rear end of the spout. Although generally satisfactory in operation, such prior cartridges have been disadvantageous because the frangible plastic sealing film was difficult to assemble cor-

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rectly into the spout. A more serious objection to such construction lies in the fact that the plastic film employed as a seal tears haphazardly when initially subjected to plastic material-extruding pressure, so that almost always pieces of the film are entrained in the dispensed plastic material. This is irritating to the operator or user, and is time-consuming, since he must pick the pieces of the seal from the dispensed material, as for example, putty which is being placed around the edge of a pane of glass.

The combined spout and seal of the present invention, on the other hand, in the preferred illustrative embodiment is of two-piece construction, the two pieces thereof being easily and quickly assembled. The seal if of such construction that one or more portions of the partition-forming part thereof are broken away at weakened zones when subjected to initial plastic material-dispensing pressure, such portions, however, remaining firmly attached to the body of the seal at one or more hinge-like zones. As a result, none of the seal breaks away to become entrained in the plastic material, and the cartridge of the invention is thus more efficiently and easily used, especially in the first portions of the dispensing operation, than are prior cartridges of a similar type.

Turning now to the drawings, a typical illustrative cartridge employing the present invention is shown in FIG. 1, wherein it is generally designated by the reference character 10. Cartridge 10 has a hollow cylindrical body 11 which may be made of any suitable material such as metal plastic, etc. The forward end of the container is provided with a transverse closure or partition member 12 which may be made, for example, of metal and which may be secured to the forward end of casing 11 by a suitable crimped or beaded joint, as shown in FIG. 1. Centrally of end closure 12, at an opening 24 therethrough, there is secured a forwardly projecting spout 14. The rear end of the housing 11 is closed by a rear end closure or partition member 15. Member 15 is designed to be progressively thrust to the left by a suitable thrusting means, such as that shown in the patent to Jones et al. No. 2,646,906, wherein such thrusting means is incorporated in a pistol grip and trigger mechanism which is designed to be attached to the rear end of the cartridge by cooperating means including the lugs 16 projecting outwardly of the housing at the rear end thereof, as shown in FIG. 1.

The combined spout and frangible seal of the present invention is shown more particularly, in a first preferred embodiment thereof in FIGS. 2-5, inclusive, in a second alternative embodiment in FIGS. 6 and 7, and in a third, alternative embodiment in FIGS. 8 and 9. Turning first to FIGS. 2-5, inclusive, the spout 14 there shown, which may be molded of a suitable plastic material such as vinyl chloride, cellulose acetate, cellulose butyrate, or polyethylene, consists of a forward frusto-conical body portion 17 which converges in a forward direction. At the rear of body 17 the spout is thickened at 19 to produce a circular cylindrical rear zone having an outer surface 20. The rear end of body 17 and the forward end of zone 20 are joined at a frusto-conical zone 21, as shown. At the rear end of zone 19 the spout is provided with a laterally outwardly projecting transverse flange 22.

At the central opening 24 throughout the forward closure member 12 there is provided a forwardly projecting circular flange 25. The outer diameter of rear portion 19 of the spout is of such diameter as snugly to fit within flange 25. The spout is secured in member 12 by being thrust forwardly through opening 24 until the forward surface of flange 22 abuts the rear surface of member 12. Following this, the forward edge of flange 25 is rolled in slightly so as to dig into portion 19 of the spout, thereby to retain the spout in sealed relation

on member 12. Rearwardly of flange 22, spout 14 is provided with a further thickened portion 26.

An annular seat 27 is provided at the rear end of the spout, such seat having a rearwardly converging frusto-conical annular sidewall 30 and a transversely extending annular base 29. Seat 27 is designed stably to retain a seal-forming insert which, in the first described embodiment, is shown particularly in FIGS. 3 and 5 where it is designated generally 31. Member 31 is formed of flexible resilient plastic material which may be, for example, vinyl chloride, cellulose acetate, cellulose butyrate, or polyethylene. Member 31 is of such size and shape as stably and sealingly to fit within the short circular cylindrical portion 33 and the seat 27 at the rear end of spout 14.

As shown in FIG. 5, insert 31 is of general cup-shape, having a side wall 32 and a transverse end wall or partition 37. The rear edge of side wall 32 is provided with a thickened or bead portion 34 which has a frusto-conical annular outer surface 36 and a forward transverse shoulder 35. Insert 31 is of such length and diameter and the elements thereof are so proportioned that the side wall 32 fits snugly within cylindrical zone 33 of the spout and the bead 34 snaps stably into the seat 27.

After the spout 14 has been assembled into the forward closure member 12, the insert 31 may be assembled into the spout. The cartridge 10 may then be filled with the desired plastic material, following which the rear end closure and plunger forming member 15 may be applied to the cartridge.

The cartridge is then in condition to be stored and/or shipped, and retains its contents substantially sealed from the atmosphere. The seal 31 is provided with means, in the form of weakened zones in the partition member 37 thereof, whereby the partition may readily be broken to provide a path for the plastic material into and through the spout upon the first application of material-dispensing pressure within the cartridge.

In the first disclosed embodiment the weakened zones in partition 37 are in the form of three diametral score lines or zones 39 which are equally angularly spaced over the extent of the partition. Such zones are in the form of grooves or broad V section in the forward face of partition 37, the grooves having an axial depth which is a substantial fraction of the axial thickness of partition 37, for example about one-half such thickness in the embodiment shown. When partition 37 is subjected to material-dispensing pressure, the partition ruptures along the score lines 39 whereby to form six sectors 40 which remain attached to the side wall 32 of the insert 31 at their outer arcuate edges 41. Once the partition has been broken through as described, sectors 40 do not impose any substantial restraint against the dispensing of the material, since the inner ends or points of the sectors readily yield outwardly, as shown in dotted lines in FIG. 2.

The seal-forming inserts of FIGS. 6 and 7, on the one hand, and FIGS. 8 and 9, on the other, are substantially similar to insert 31, except as to the configuration of the weakened zone or zones in the seal-forming partition thereof. Accordingly, all parts of each of such inserts, except such partitions and portions of the partitions, are designated by the same reference characters as those employed in conjunction with insert 31.

Insert 42 (FIGS. 6 and 7) has the transverse end wall or partition 44 thereof provided with a generally circular score line or weakened zone 45 which is located close to the border of such partition. The score line is interrupted at a short zone 49, so that when partition 44 is subjected to material-extruding pressure a single panel 46 is broken from the insert along the line 47, remaining securely attached to the body of the insert, however, at the unscored hinge-forming portion 49.

In the seal-forming insert 50 of FIGS. 8 and 9, the end wall or partition 51 is provided with three score lines or weakened zones. Two of such zones are in the form

of partition-circular zones 52 disposed close to the edge by partitions and equally angularly spaced to form similar unscored zones 56. The third weakened zone extends diametrically of the partition between the mid-points of each of the zones 52. When the partition 51 is subjected to material-dispensing pressure, the partition is broken along the lines 52 and 54, thereby to form two similar panels 55 which swing outwardly from the axis of the insert, as shown in FIG. 9, and which remain firmly and securely attached to the body of the insert by the hinge-forming unscored zones 56.

Although only a limited number of embodiments of the invention have been illustrated in the accompanying drawings and described in the foregoing specification, it is to be especially understood that various changes, such as in the relative dimensions of the parts, materials used, and the like, as well as the suggested manner of use of the apparatus of the invention, may be made therein without departing from the spirit and scope of the invention as will now be apparent to those skilled in the art.

What is claimed is:

1. A cartridge for use with guns for dispensing plastic material, comprising an elongated tube having an end closure member including a dispensing spout secured to said end closure member, said spout having a passage therethrough and a seat having an internal shoulder formed therein intermediate its ends, and an insert made of plastic material in said seat, said insert having an annular sidewall and a transverse partition member closing the passage through the spout, said partition member being formed of an initially impervious relatively heavy, self-sustaining resilient flexible plastic material containing at least one elongated zone of weakness, the zone of weakness extending around a predominant part of the periphery of at least one panel-shaped area of the partition member, the remainder of the periphery being unweakened and lying along the juncture between the partition member and the sidewall of the insert, whereby when the partition member is subjected to appreciable outwardly directed pressure, in the initial dispensing of the plastic material from the cartridge, the partition member is fractured along the zone of weakness but each of the parts thereof remains attached to the sidewall of the insert by an unweakened zone disposed between the sidewall and said part.

2. A cartridge as defined in claim 1, wherein the zones of weakness of the partition member are formed by at least one score therein extending to a depth which is a substantial part of the thickness of the member.

3. A cartridge as defined in claim 2, wherein the score is so disposed as, when the partition member is fractured, to produce at least one panel portion which remains attached to the spout by a hinge-like portion located adjacent the wall of the passage through the spout.

4. A cartridge as defined in claim 3, wherein the score extends continuously along the outer edge of the partition member throughout a preponderant part of the periphery thereof, opposite ends of the score lying close to but spaced from each other, whereby to form, when the partition is fractured, a panel which remains hingedly secured to the spout at its edge in the zone between the ends of the score.

5. A cartridge as defined in claim 3, wherein the score includes two separate substantially similar score portions extending along the outer edge of the partition member, the said two separate score portions being disposed on opposite sides of a diameter of the partition member, the confronting ends of the separate score portions lying close to but spaced from each other, and a further score portion extending generally diametrically of the partition and joining the separate score portions generally midway of the lengths of the latter, whereby to form, when the partition is fractured, two at least partially rounded panels which remain hingedly secured to the spout at their edges.

6. A cartridge for use with guns for dispensing plastic

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material, comprising an elongated tube, a disc-shaped end closure member secured to one end of the tube, said closure member having an opening formed therein, a dispensing spout having a passage therethrough, a laterally extending flange formed on its inlet end, and a seat having an internal circumferential shoulder formed therein intermediate its ends, said spout projecting through said opening in the end closure member the flange on the dispensing spout engaging the inner surface of said closure member about said opening, and an integral cup-shaped insert in said seat, said insert having an annular sidewall and a transverse partition member disposed across one end of the sidewall, constituting the bottom of the cup-shaped insert, and closing the passage through the spout, said partition member being formed of an initially impervious relatively heavy, self-sustaining resilient flexible plastic material containing at least one scored zone of weakness, the zone of weakness extending around a predominant part of the periphery of at least one panel-shaped area of the partition member, the remainder of the periphery being unweakened and lying along the juncture between the partition member and the sidewall of the insert, whereby when the partition member is subjected to appreciable outwardly directed pressure, in the initial dispensing of the plastic material from the cartridge, the partition member is fractured along the zone of weakness but each of the parts thereof remains attached to the sidewall of the insert by an unscored portion of the partition member located between the sidewall and said part.

7. A cartridge as defined in claim 6, wherein there are a plurality of generally diametrical score lines in the partition member which, when the partition member is fractured, produce a plurality of sector-like panels which remain hingedly secured to the spout.

8. A cartridge as defined in claim 6, wherein the score extends along the outer edge of the partition member throughout a preponderant part of the periphery thereof, whereby to form, when the partition is fractured, an at least partially rounded panel which remains hingedly secured to the spout at its edge.

9. A cartridge for use with guns for dispensing plastic material, comprising an elongated tube having an end closure member including a transversely disposed disc-shaped member and a dispensing spout having its axially

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inner end portion, adjacent the interior of the cartridge, secured to the disc-shaped member at an opening in the latter, said spout having a passage therethrough, the sidewall of a zone of substantial length at the inner end of the passage being generally of circular cylindrical shape, an annular seat surrounding the inner end of the passage, and a generally circular cylindrical integral insert made of plastic material telescopically mounted within said inner zone of the passage, said insert having an annular sidewall closely confronting the sidewall of the passage at such zone, a flange on the outer end of the insert fitting within the annular seat, and a transverse partition member on the axially outer end of the insert, said partition member closing the passage through the spout, said partition member being formed of an initially impervious relatively heavy, self-sustaining resilient flexible plastic material containing at least one elongated zone of weakness, the zone of weakness extending around a predominant part of the periphery of at least one panel-shaped area of the partition member, the remainder of the periphery being unweakened and lying along the juncture between the partition member and the sidewall of the insert, whereby when the partition member is subjected to appreciable outwardly directed pressure, in the initial dispensing of the plastic material from the cartridge, the partition member is fractured along the zone of weakness but each of the parts thereof remains attached to the sidewall of the insert by an unweakened zone disposed between the sidewall and said part.

10. A cartridge as defined in claim 9, wherein the annular seat in the spout has walls which form reentrant angles with respect to each other in radial axial planes, and the surfaces of the flange on the insert which engage said surfaces of the seat are generally complementary thereto, whereby the flange is interlocked with the seat.

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