

⑫ **EUROPEAN PATENT APPLICATION**

⑰ Application number: **86116079.4**

⑤① Int. Cl.⁴: **B65D 85/72** , **B65D 83/00**

⑳ Date of filing: **20.11.86**

③① Priority: **09.12.85 JP 189207/85**

④③ Date of publication of application:
15.07.87 Bulletin 87/29

⑥④ Designated Contracting States:
BE DE FR GB

⑦① Applicant: **Toray Silicone Co., Ltd.**
8 Nihonbashi-muromachi 2-chome
Chuo-ku Tokyo 103(JP)

⑦② Inventor: **Kadono, Motoaki**
19-77-1, Kuromaru-cho
Fukui-shi Fukui Prefecture(JP)
Inventor: **Hashimura, Kazutoyo**
24-1, 5-chome, Taishido Setagaya-ku
Tokyo(JP)
Inventor: **Kobayashi, Tamotsu**
580-19, Ohmiya-cho
Chiba-shi Chiba Prefecture(JP)

⑦④ Representative: **Spott, Gottfried, Dr. et al**
Patentanwälte Spott und Puschmann
Sendlinger-Tor-Platz 11
D-8000 München 2(DE)

⑤④ **Sealant cartridges.**

⑤⑦ Sealant cartridges which have non-slip off labels can be made by heat-shrinking a resin film tube on a cartridge which has a cylindrical cartridge body with an outside diameter which increases toward the extrusion part end and an inside diameter which remains constant along the length. The heat-shrunk resin film end extending toward the extrusion part covers the outer margin of the shoulder.

EP 0 228 556 A2

SEALANT CARTRIDGES

The present invention relates to a sealant cartridge in which a cylindrical cartridge body has been inserted into a tube of a heat-shrinkable resin film and said resin film then heat-shrunk.

The sealant cartridges used for sealant storage and application consist of a cylindrical cartridge body with a shoulder, the latter having an extrusion part, and a plunger inserted into the opening at the back end. For each sealant brand, the external surface of the cartridge body of such a sealant cartridge must be printed with, for example, a trademark, the names of the manufacturer and/or distributor, use instructions and, a pattern. However, this makes mass production difficult and, moreover, it is difficult to obtain a sharp image when the cartridge material is a thermoplastic resin.

As a consequence, sealant cartridges are used in which the cylindrical cartridge body has been inserted into a tube of a heat-shrinkable resin film and the resin film then heat-shrunk. In this approach, the external surface of the cartridge body is not imprinted, and the trademark, pattern, etc., are printed on the heat-shrinkable resin film tube.

However, the following problem occurs in connection with said prior sealant cartridges. Even after the tube of heat-shrinkable resin film has been tightly heat-shrunk over the cylindrical cartridge body, this tube may be axially displaced, or in the extreme case may slip from the cartridge body, because the outside diameter of the cartridge body is constant along its length. In other words, the problem is axial displacement of the cartridge body and, in the extreme case, slippage of the cartridge body from the heat-shrinkable resin tube. This problem is particularly significant when the external surface of the cartridge body is flat and smooth and the cartridge body is made of synthetic resins such as polyethylene or polypropylene.

Figure 1 is a longitudinal cross-section of one embodiment of the sealant cartridge of the present invention. Figure 2 is a plane diagram of said sealant cartridge.

- 11 -cartridge body
- 12 -shoulder
- 13 -plunger
- 14 -extrusion part of the cartridge body
- 15 -moistureproof film
- 16 -sealant extrusion discharge nozzle
- 17 -heat shrunk resin film tube
- 18 -end edge of heat-shrunk resin film tube
- 17 covering outer margin of the shoulder

The inventors examined various methods for overcoming the preceding problem in the prior art and, as a result, developed this cartridge and method of making it. The object of the present invention is to provide a sealant cartridge in which the tube of heat-shrunk resin film will not slip or be displaced axially, and will not slip from the cartridge body. In other words, the cartridge body of such a sealant cartridge is not to be displaced axially and should not slip from the tube of heat-shrunk resin film.

The present invention relates to a sealant cartridge comprising an extrusion part on a shoulder of a cylindrical cartridge body in which the shoulder joins the extrusion part and the cylindrical cartridge body and the outside diameter of said cartridge body increases in the direction of the shoulder while its inside diameter remains constant along the length, a heat-shrunk resin film covers at least part of the cylindrical cartridge body extending toward the extrusion part of said cartridge and covering the outer margin of the shoulder.

The present invention also relates to a method of making a sealant cartridge comprising inserting a heat-shrinkable resin film tube over a cylindrical cartridge body in which there is an extrusion part on a shoulder of the cylindrical cartridge body and the shoulder joining the extrusion part to the cylindrical cartridge body where the outside diameter of said cartridge body increases in the direction of the shoulder while the inside diameter of the cartridge body remains constant along the length of the cartridge, and thereafter heating and positioning said resin tube such that the resultant heat-shrunk resin film covers at least part of the cylindrical cartridge body extending toward the extrusion part of said cartridge and covering the outer margin of the shoulder.

In the sealant cartridge of the present invention, the outside diameter of the cartridge body increases in the direction of the shoulder while the inside diameter remains constant along the length. This prevents movement of the cartridge body within the heat-shrunk resin film tube: the extrusion part of the cartridge body is prevented from moving back into the tube of heat-shrunk resin film.

Furthermore, the end edge of said resin film covers the outer margin of the shoulder of said cartridge body. This also prevents movement of the cartridge body within the heat-shrunk resin film tube: the plunger end of the cartridge is prevented from moving forward in the tube of heat-shrunk resin film.

The present invention will be explained using an example of execution with reference to the drawings. Figure 1 is a longitudinal cross section of one embodiment of the sealant cartridge of the present invention. Sealant (not illustrated), for example, a single-package silicone sealant, a single-package polyurethane sealant, a single-package polysulfide sealant, or acrylic sealant, is filled into cartridge body 11 and plunger 12, which is used to extrude the sealant, is inserted at the back end. Extrusion part 14 is formed on shoulder 12 of cartridge body 11. Screw threads are formed on the outer circumference of the extrusion part 14 and a moistureproof film 15 is attached over the extrusion tip of extrusion part 14 in order to close off the opening. In the present case, a sealant extrusion discharge nozzle 16 is screwed onto the outer circumference of extrusion part 14. The cartridge body is thinly formed throughout and its outside diameter gradually increases in the direction of shoulder 12 while the inside diameter remains constant along the length. As a consequence of this thickness variation, cartridge body 11 is about 1.3-fold thicker at its topmost extremity - (extrusion part end) than at its rearmost point - (plunger end). This thickness ratio, topmost extremity to rearmost point, is preferably 1.1 to 1.7. Resins to be molded into the cartridge body 11 are preferably thermoplastic resins such as polyethylene or polypropylene. The preferred molding methods are injection molding and blow molding.

In general, the external surface of cartridge body 11 will not carry printing, but a trademark or pattern can be printed thereon when the heat-shrunk resin film tube 17 is transparent. The cartridge body 11 is inserted into a heat-shrinkable resin film tube and this film is then heat-shrunk in order to cling to the external surface of cartridge body 11. The end of the heat-shrinkable resin tube extending toward the extrusion part of the cartridge is positioned such that it covers the outer margin of shoulder 12 of cartridge body 11.

The edge of the heat-shrunk resin film which covers the outer margin of shoulder 12 may contact the base of extrusion part 14. This heat-shrunk resin film tube 17 which covers at least part of the cylindrical cartridge body 11 is to be printed with the brand name, name of the manufacturer and/or distributor, use instructions, volume, patterns, etc. - (none of which are illustrated), and it may be transparent, translucent, or opaque.

Actual examples of materials to be used for the heat-shrinkable resin film are vinyl chloride resins, nylon resins and polyethylene resins. It is preferably subjected to a surface treatment to obtain a sharp printed image.

Even when this sealant cartridge is stood upright and manually grasped from above at its upper end and raised up and waved about, the cartridge body 11 will not slip or drop down and so will not slip or fly out. Also, the heat-shrinkable resin film tube 17 will not slip or move up.

Furthermore, when plunger 13 is pushed from the rear of cartridge body 11 toward the shoulder in order to extrude the sealant from the cartridge through the extrusion part 14, this sliding operation will be smooth and there will be no leakage of sealant from any gap between plunger 13 and cartridge body 11. Accordingly, such steps as packing sealant cartridges in a corrugated cardboard box, removing them, and loading the caulking gun for sealant extrusion can now be conducted easily, reliably and rapidly.

Also, when the brand of sealant filled into cartridge body 11 is changed, only the printing on the heat-shrinkable resin film tube need be changed - (assuming no printing appears on the cartridge body 11). This makes possible the extremely economically advantageous mass production of the same variety of cartridge body 11.

Additionally, while a nozzle 16 is screwed onto extrusion part 14 in the preceding example, the present sealant cartridge also encompasses the case in which the extrusion part is itself directly formed into a nozzle.

With regard to sealant cartridges having a cylindrical cartridge body with an extrusion part on a shoulder, wherein the cartridge body is inserted into a tube of heat-shrinkable resin film and the resin is heat-shrunk, the sealant cartridge of the present invention is distinguished in that the outside diameter of the cartridge body increases in the direction of the tip while the inside diameter remains constant along the length; and in that the end edge of said resin film tube covers the outer margin of the shoulder of said cartridge body. As a consequence of said invention, the tube of heat-shrunk resin film will not slip or be displaced axially along the cartridge body, nor will it come off the cartridge body. Or in other words, the cartridge body will not be axially displaced and will not slip from the tube of heat-shrunk resin film. Furthermore, when the plunger is pushed from the rear toward the shoulder, the sliding operation will be smooth and leakage of sealant from between the plunger and cartridge body will be prevented. Consequently, packing and application operations using the present sealant cartridge will be easy, reliable, and rapid.

Claims

1. A sealant cartridge comprising an extrusion part on a shoulder of a cylindrical cartridge body in which the shoulder joins the extrusion part and the cylindrical cartridge body and the outside diameter of said cartridge body increases in the direction of the shoulder while its inside diameter remains constant along the length, a heat-shrunk resin film covers at least part of the cylindrical cartridge body extending toward the extrusion part of said cartridge and covering the outer margin of the shoulder.

2. A method of making a sealant cartridge comprising inserting a heat-shrinkable resin film tube over a cylindrical cartridge body in which there is an extrusion part on a shoulder of the cylindrical cartridge body and the shoulder joining the extrusion part to the cylindrical cartridge body where the outside diameter of said cartridge body increases in the direction of the shoulder while the inside diameter of the cartridge body remains constant along the length of the cartridge, and thereafter heating and positioning said resin tube such that the resultant heat-shrunk resin film covers at least part of the cylindrical cartridge body extending toward the extrusion part of said cartridge and covering the outer margin of the shoulder.

30

35

40

45

50

55

Fig. 1

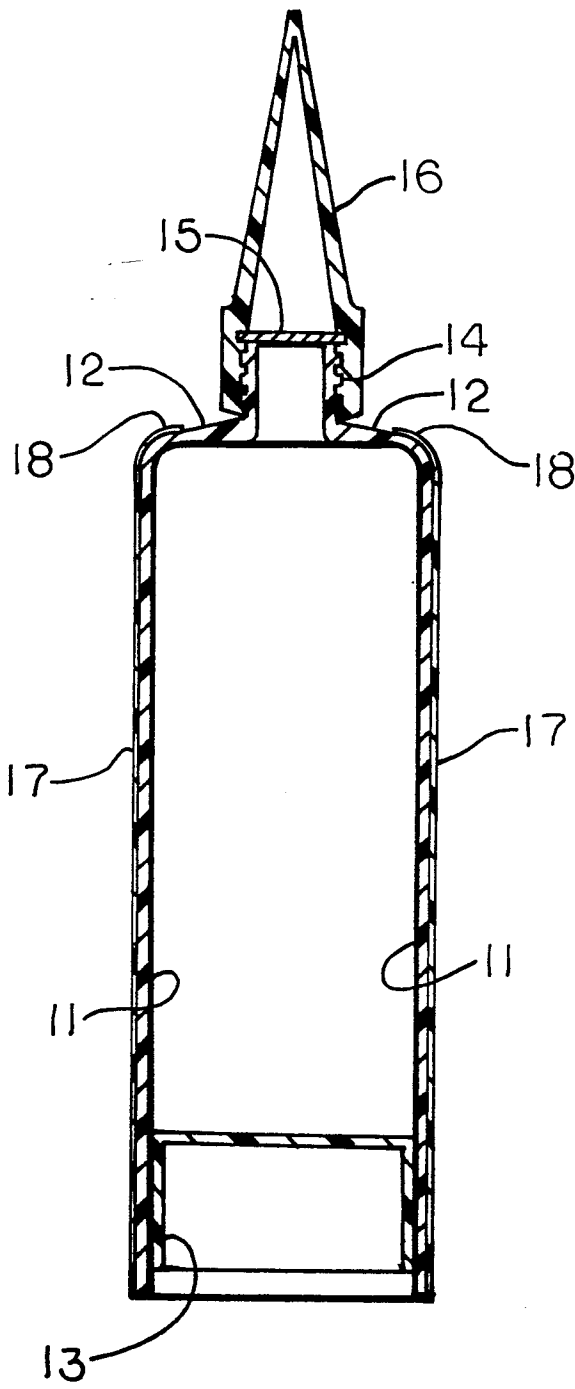


Fig. 2

