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GUN ADAPTOR FOR VISCOUS MATERIAL

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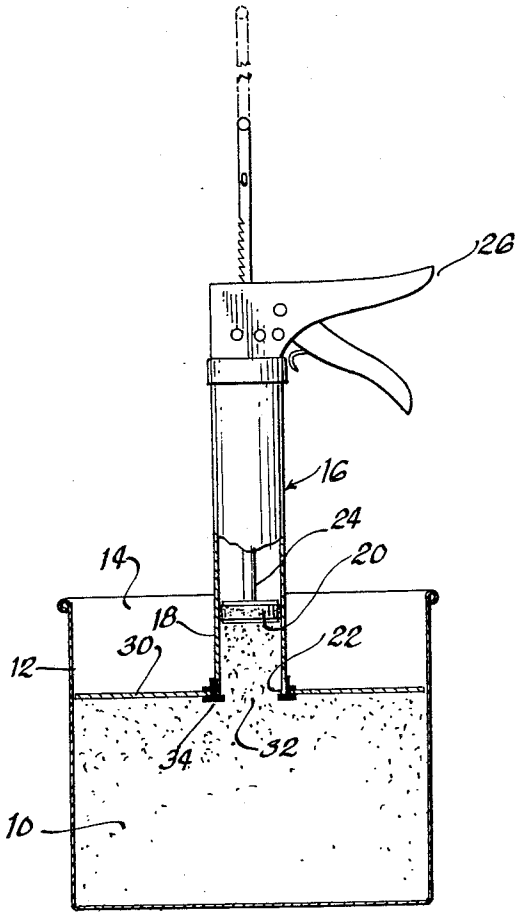


FIG. 1



FIG. 2

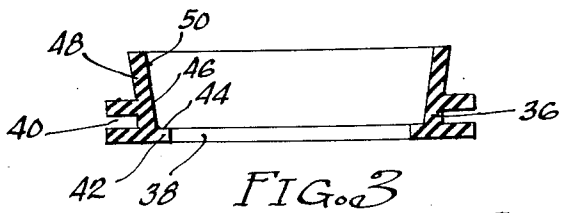


FIG. 3

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GUN ADAPTOR FOR VISCOUS MATERIAL

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This invention relates to an adaptor for use in combination with a dispensing gun and container of dispensable material capable of viscous flow to refill the dispensing gun from said container.

In describing the invention, reference will be made to the use of the adaptor in refilling a dispensing gun with caulking compound supplied in a five-gallon pail. It will be understood that the concepts of this invention will have application to the filling of dispensing guns with other materials capable of viscous flow, such as grease, jellies and the like and from containers of capacities other than a five-gallon can.

It is an object of this invention to produce an adaptor for use in combination with a dispensing gun to enhance the operation of refilling the gun with viscous material supplied in a container of larger capacities while simultaneously protecting the material in the container and with minimum contamination of the exposed surfaces of the gun with material with which it is adapted to be filled.

More specifically it is an object of this invention to produce an adaptor which may be received in substantially fitting relation on the surface of viscous material housed within a container for operation as a protective cover thereof; which is capable of providing an effective sealing relationship with the surface of the material in the container for the transmission of suction forces to draw the viscous material through the adaptor into the barrel of the gun; which is formed with a grommet capable of receiving the end of the gun in fitting relation for an effective seal to enable transmission of suction forces from the gun on one side to the viscous material on the other to effect displacement of the material from the container into the barrel of the gun; which receives the gun in sealing relation out of contact with the viscous material whereby the material is caused to flow cleanly through the adaptor into the barrel of the gun with minimum contamination of the exposed surfaces of the gun; which is formed of low cost and readily available materials which enable the adaptor to be discarded with the container upon removal of all of the content material therefrom; which is formed of relatively few, simple parts which are easily assembled into an efficient unit capable of use with relatively inexperienced operators and it is a related object to produce a new improved reusable grommet for use in same.

These and other objects and advantages of this invention will hereinafter appear and, for purposes of illustration, but not of limitation, an embodiment of the invention shown in the accompanying drawings, in which:

FIGURE 1 is a schematic elevational view illustrating the adaptor embodying the features of this invention in position of use;

FIGURE 2 is a top plan view of the adaptor shown in FIGURE 1; and

FIGURE 3 is a sectional elevational view of the replaceable grommet in the adaptor of FIGURE 2.

Referring now to the drawings, caulking compound **10** or other material capable of viscous flow is usually supplied for use in a metal container **12** of cylindrical shape having an open end **14** which is initially sealed by a removable cover. Use of the viscous material is usually made by a dispensing gun **16** in the form of an elongate cylinder **18** having a piston **20** displaceable endwise therein for drawing viscous material into the barrel of the gun

within the cylinder in response to endwise displacement of the piston toward the head end of the cylinder and for forcing the viscous material from the cylinder through the nose piece **22** in response to forceable displacement of the piston **20** toward the nose piece of the cylinder. The piston is provided with a piston rod **24** that extends outwardly through the base of the cylinder for actuation to displace the rod in one direction or the other for filling the gun with viscous material or displacing it in use. A handle **26** is provided on the base end of the cylinder and the means for endwise displacement of the piston rod **24** is usually associated with the handle. Since the displacement of the piston and rod forms no part of this invention, suffice to say that various conventional means are known for effecting such actuation.

In use, it would be possible to fill the gun merely by submerging the nose piece **22** below the level of the viscous material **10** in the pail **12** while displacing the piston **20** toward the head end of the cylinder. This has been found to be undesirable for the reason that material is also taken up by the submerged portions on the exposed surfaces of the gun with the result that extensive cleaning operations are required for removal thereof before use can again be made of the gun. Further, it is difficult properly to locate the gun in the viscous material during actuation of the piston. As a result, the amount of insertion varies from a complete loss of contact and improper filling to excessive submergence. The latter condition provides for excessive contamination and work in addition to the increased deterioration of the gun due to dirt and contamination.

Another undesirable factor in the mere submergence of the gun nose for filling resides in the danger of contamination and deterioration of the viscous material as the level drops in the container. Exposure of the surface of the material to the elements in the atmosphere enables drying out or other reactions to take place and dirt and other substances can fall into the material while the cover is removed to cause undesirable modification thereof. This is especially true with caulking compounds as used in the construction industries where the covers are usually left off of the containers and dirt, dust and flying particles are ever present.

It is a concept of this invention to provide an adaptor for use with containers of the type described for the protection of the content material and for facilitating the removal of the viscous material in filling the gun without excessive submergence of the gun or parts thereof into the material and without the material collecting on the exposed surfaces of the gun where it can interfere with the normal operation of the gun, or cause deterioration of the gun, or otherwise require its removal.

In accordance with the practice of this invention, there is provided an adaptor in the form of a thin, flat disc plate **30** having an external dimension preferably corresponding to the internal diameter of the container to be received therein in fitting relation and permit free movement of the disc plate member through the open end of the container for displacement vertically in the container as a piston. While it is preferred to have the disc plate dimensioned to be received in sliding relation within the container, it will be understood that the disc plate can be of slightly lesser dimension as long as a sufficient area over the surface of the material is contacted for support and for effecting a sealing relationship between the underside of the disc plate and the surface of the material. When the material is sufficiently viscous, as in a caulking compound, the disc plate, lying flat upon the surface, will be incapable of displacement flatwise through the viscous material. Instead, it will ride up the surface in sealing relationship therewith to operate as a protective cover

which separates the material from the elements in the atmosphere and from dirt, dust and the like.

The disc plate 30 can be formed of any relatively rigid material such as wood, metal, plastics, plywood and the like but it is preferred to form the disc plate out of less expensive cellulosic material such as cardboard, fiber board and the like, with or without resinous treatment to minimize reaction with the viscous content material in the container. Best results in an inexpensive disc plate are secured by the use of a laminae formed of a number of plies and cellulosic fibers in random arrangement to impart flexibility and strength in all directions coupled with a rigidity sufficient for use as a diaphragm or piston in the described system.

The disc plate 30 is provided with a circle opening 32 in the central portion thereof corresponding somewhat to the diameter of the gun cylinder 18 but preferably slightly less.

Removably received within the opening as a lining is a grommet 34 which may be molded or otherwise formed of a relatively flexible and resilient material, such as a synthetic or natural rubber or other elastomer, or of a flexible and resilient plastic such as polyethylene, plasticized polyvinylchloride, cellulose acetate butylate.

The grommet is adapted removably to receive as a lining about the opening of the disc plate. For this purpose, the grommet is formed of a frusto-conical section 36 having a bottom wall 42 formed with a central opening 38 extending therethrough and dimensioned to be less than the diameter of the opening 32 in the disc plate. The frusto-conical section has an outer wall to wall dimension which is greater than the diameter of the opening and it is formed with an annular groove 40 extending inwardly from the periphery in an intermediate portion of the frusto-conical section for a distance corresponding to the difference between the diameter of the opening 32 and the diameter of the frusto-conical section to enable the grommet to be mounted to the disc plate with the portions of the disc plate about the opening received in a snug fitting relation within the groove 40. This establishes a tortuous path communicating the topside of the disc plate with the bottomside about the inserted grommet.

The inner contour of the grommet is defined by an annular flange extending inwardly substantially horizontally for a short distance from the base of the frusto-conical section to provide an upwardly facing horizontally disposed shelf 44 adapted to function as a rest for the nose 22 of the gun 16 to block excessive insertion of the nose piece therethrough into the viscous material. From the outer edge of the shelf 44, the inner wall 46 of the frusto-conical section extends vertically upwardly at a slight outward angle adapted somewhat to correspond with the shape of the nose piece of the gun about its inlet opening. To enhance the sealing relationship desired to be established between the nose piece and the grommet, for better transmission of suction through the grommet, the frusto-conical section 36 is provided with an extension 48 in the form of an annular skirt of relatively thin cross section which extends upwardly at a slight outward angle from the inner edge of the frusto-conical section in a manner to bring the inner surface 50 of the skirt. The resilient skirt 48 is capable of greater deformation for more substantial conformance with the nose piece of the gun to establish a better sealing relationship therebetween.

In use, the grommet 34 is flexed to enable the rim of the disc plate about the central opening 32 to be received in the annular groove 40 of the frusto-conical section. In this position, the grommet fits rather snugly on the disc plate to establish an effective sealing relationship therewith. After the cover of the container is removed, the disc plate is placed onto the surface of the viscous material with the skirt portion of the grommet uppermost. In this position the underside of the disc plate comes to rest on the surface of the viscous material to effect a sealing relation therewith while the bottom portion of the cylindrical section in the grommet becomes inbedded within the viscous material.

When it is desirable to refill the gun 16 with viscous material, the nose 22 of the gun is inserted into the frusto-conical section until it comes to rest upon the shelf 44. Inward displacement is stopped as the nose of the gun comes into resilient engagement with the shelf thereby to prevent insertion of the nose piece completely through the opening of the adaptor and into submergence in the viscous material. As the nose piece comes to rest on the shelf, a sealing relationship is established between the nose piece and the grommet, including also the area between the frusto-conical section 46 and 50 and the nose piece.

The shelf will prevent inward displacement of the gun responsive to any continued downward pressure so that such pressure can be applied to the gun concurrently with outward displacement of the piston without displacement of the nose piece of the gun into the viscous material. Such outward displacement of the piston will cause suction to develop which will be transmitted from the gun through the grommet to the viscous material to draw the latter from the pail and through the bore of the grommet into the inlet of the gun barrel. The continued downward pressure on the gun cylinder will cause the disc plate 30 to shift downwardly with the level of the material constantly to maintain a sealing relationship therewith.

Thus, when the gun is filled, the gun can be removed cleanly and easily from the container with very little, if any, material on the exposed surfaces of the gun. This enables the gun to be kept clean and in good working condition and to make a more efficient and better use thereof in the subsequent caulking operation. Also, the disc plate remains in sealing relation to protect the surface of the material from drying out or from contamination or from reactions of the elements existing in the atmosphere thereby to provide protection even when the cover is left off of the pail.

It will be apparent that the dimensional characteristics of the grommet can be calculated from the dimensional characteristics of the nose piece of the gun but it is undesirable to have the shelf 44 extend inwardly for a distance to provide an opening which is less than inlet to the nose piece but more than the external diameter of the cylinder to function as a top for positioning the nose piece out of direct contact with the viscous material other than the contact which might be made with the inlet or material immediately surrounding the inlet.

It will be understood that the disc plate 30 and the grommet 34 can be formed of the same plastic or other relatively rigid moldable material. Under such circumstances, the grommet and plate can be molded as one piece to provide a unitary assembly embodying the features of this invention.

It will be further understood that changes may be made in the details of construction, arrangement and operation without departing from the spirit of the invention especially as defined in the following claims.

I claim:

1. In combination, a container of large capacity having a material capable of viscous flow therein to be dispensed, a dispenser formed of a cylinder having a nose at one end through which the material is taken into the cylinder for filling and extruding out of the cylinder in use, a piston shiftable within the cylinder to draw the material into the cylinder in response to movement in one direction and to extrude the material from the cylinder in response to movement in the opposite direction, and means for effecting displacement of the piston, an adaptor comprising a flat disc plate dimensioned slidably to be received within said container for resting in sealing relationship on the surface of the viscous material therein, an opening through the disc plate, and an elastomeric fitting secured in sealing relationship about the opening in the disc plate for receiving the nose of the cylinder in sealing

relationship for transmitting suction forces from the cylinder on one side to the viscous material on the other to draw the material through the fitting and the nose of the cylinder into the cylinder for filling, said fitting comprising a frusto-conical sleeve section formed of a relatively resilient material having an opening extending through the central portion thereof, means on the outer wall of the frusto-conical sleeve section for removably mounting the sleeve section in the opening of the disc plate, an annular rim integral with said sleeve section extending inwardly from the wall of the frusto-conical sleeve section the inner diameter of the opening surrounded by the rim being less than the diameter of the cylinder to militate against the movement of the cylinder beyond the rim when the nose of the dispenser is inserted into the opening, said rim being horizontally disposed to function as a ledge on which the dispenser rests in position for filling, and a skirt, integral with said sleeve, formed of a resilient material extending upwardly and outwardly from the frusto-conical sleeve section about the opening to provide a frusto-conical wall leading into the sleeve opening at its base.

2. A device as claimed in claim 1 in which the means for removably mounting the sleeve section comprises an annular recess in the outer wall dimensioned to receive the rim portion of the disc plate about the opening in fitting relation therein.

3. A device as claimed in claim 1 in which the inner wall of the cylindrical section about the rim is inclined outwardly to provide a conical section.

4. A device as claimed in claim 3 in which the conical wall of the cylindrical section is continuous with the conical wall of the skirt.

5. A device as claimed in claim 1 in which the opening defined between the walls and the skirt in the outer-end portion is of larger dimension than the diameter of the cylinder and in which the opening defined between the walls of the aligned conical sections of the lower end portion is less than the diameter of the cylinder.

References Cited in the file of this patent

UNITED STATES PATENTS

2,039,009	Lampman	Apr. 28, 1936
2,083,590	Barks	June 15, 1937
2,459,005	Shearman	Jan. 11, 1949
2,543,909	Hatheway	Mar. 6, 1951