United States Patent [19]

Roesel et al.

[11] **3,880,324**

[45] **Apr. 29, 1975**

[54] **PASTE-LIQUID DISPENSER WITH REMOVABLE PUNCTURE ROD**

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[22] Filed: **Jan. 14, 1974**

[21] Appl. No.: **433,274**

[52] **U.S. Cl.** **222/82**; 222/389

[51] **Int. Cl.** **B67b 7/24**

[58] **Field of Search** ..... 222/81, 82, 83.5, 86, 88, 222/148 T, 151, 400.7, 389

[56] **References Cited**

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1,545,379	7/1925	Winkley	222/389 X
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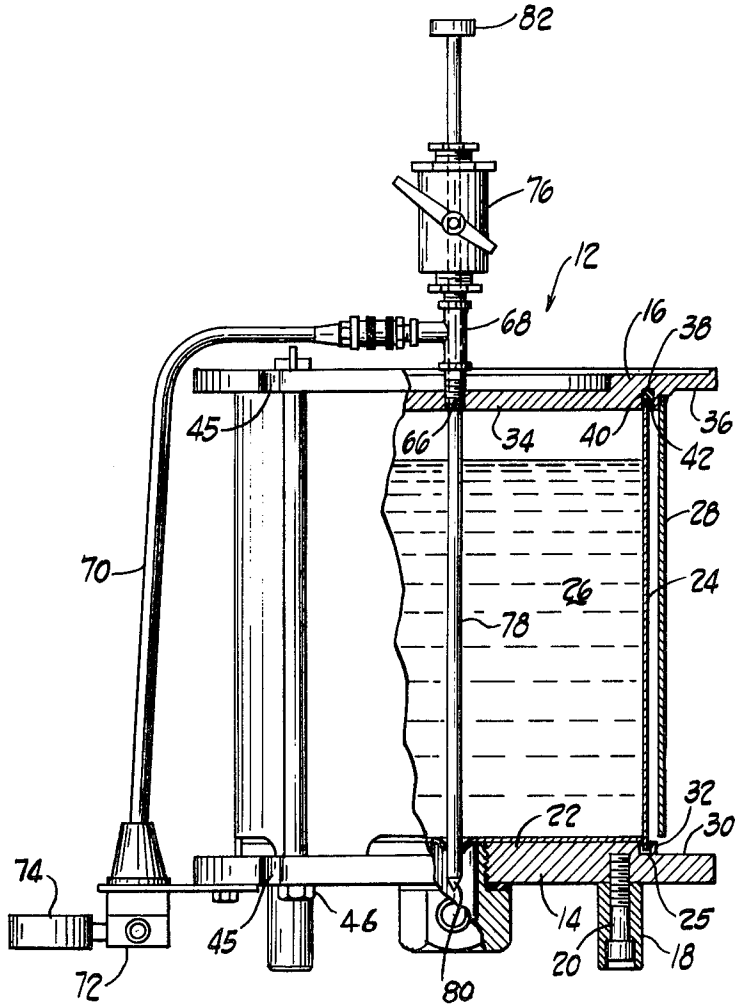
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[57] **ABSTRACT**

Dispensing apparatus for dispensing various types of fluid and pastes from a shipping container wherein the container functions as an integral part of the dispensing apparatus.

The apparatus includes a puncture rod inserted through the container to puncture the container bottom, also the apparatus includes a follower plate to be placed on top of the paste or fluid following removal of the puncture rod.

3 Claims, 3 Drawing Figures



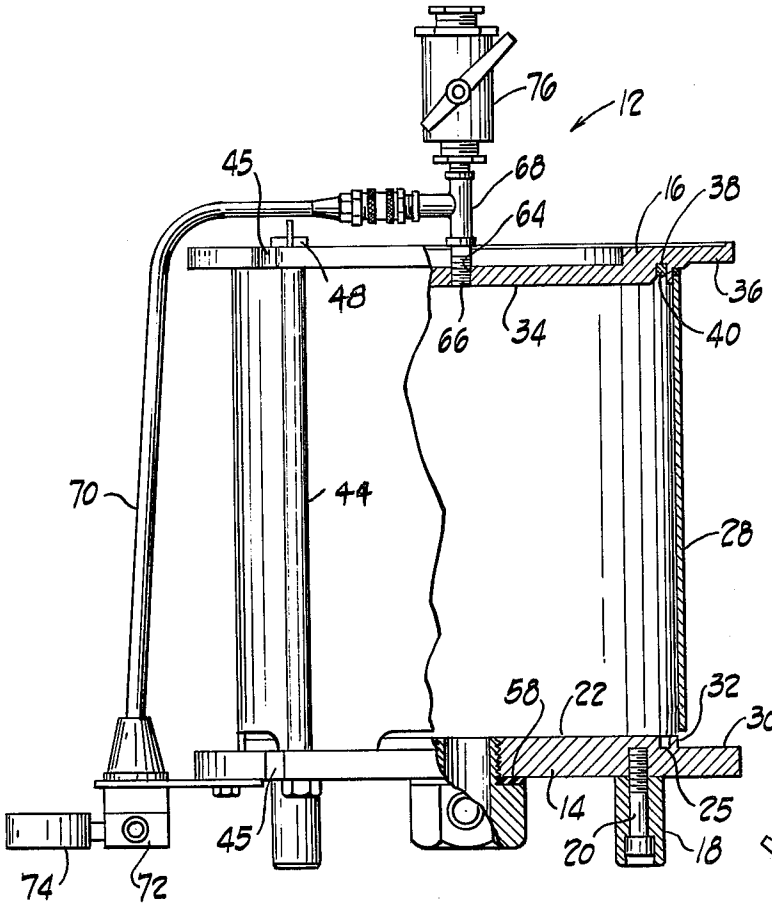

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Fig. 1

Fig. 2

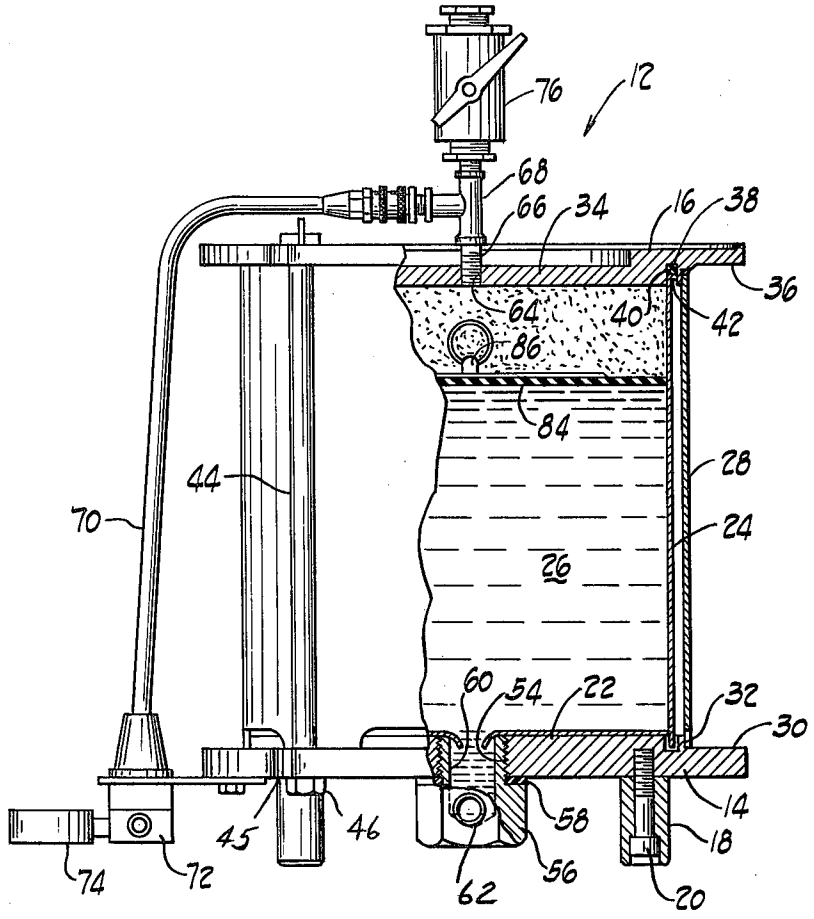

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Fig. 3

PASTE-LIQUID DISPENSER WITH REMOVABLE PUNCTURE ROD

The present invention relates to a dispensing apparatus for pastes and fluids, and in particular to such an apparatus in which the shipping container for the pastes and fluids functions as an integral part of the apparatus. The invention is particularly suitable for industrial-type applications where relatively large amounts of material are to be dispensed, and where the material to be dispensed is relatively expensive such as brazing pastes, requiring substantially complete removal of the material from the shipping container.

BACKGROUND OF THE INVENTION

Dispensing apparatus for various types of materials are well known and assume a variety of designs. Typically, however, they employ a cylinder which is carefully machined into which the material to be dispensed is transferred from the shipping container. The apparatus then dispenses the material from a cylinder, usually be means of a piston, which is also carefully machined, connected to a suitable actuating means. The outlet end of the cylinder is usually tap fitted with a valved connection through which the material to be dispensed flows.

Aside from being relatively expensive, such apparatus requires that the paste or fluid be transferred from its shipping container prior to dispensing, usually involving some waste of the material and adding to production costs in use of the material.

It is known to dispense directly from the container in which the material is shipped. Typical apparatus so designed include home-type dispensing units wherein relatively small cartridges are placed in a gun having a nozzle and a trigger actuated means used to force the paste or fluid from the cartridge through the nozzle. The latter has a puncture means to puncture the dispensing end of the cartridge. One such apparatus is shown in U.S. Pat. No. 3,130,872; and it is clearly an apparatus unsuitable for industrial-type applications.

U.S. Pat. No. 2,322,808 to Hothersall shows an apparatus for dispensing grease from a factory sealed container. The apparatus includes a casing which is adapted to be pressurized, a removable cover for inserting the shipping container into the casing, and an outlet connection at the bottom of the casing. A puncture means associated with the casing cover punctures the container top opening the inside of the shipping container to pressurized air. The container itself has a follower plate which when exposed to the air pressure within the casing forces material from the container. In this latter regard, a sealed lever-actuated puncture device punctures the bottom of the container communicating the material to be dispensed with an outlet connection.

Several problems are experienced with apparatus of this type. In particular, each shipping container must be provided with its own follower plate which either must be carefully machined or is not capable of completely wiping the sides of the shipping container. In addition, the puncture opening in the bottom of the container is made from the outside inwardly forming an inwardly protruding metal tab which prevents the follower plate from totally removing material from the bottom of the container. The above problems can result in substantial losses of material to be dispensed which can be of some consequence for relatively expensive materials such as brazing pastes. In the Hothersall Patent, the material being dispensed is a relatively inexpensive lubricant material.

SUMMARY OF THE INVENTION

These and other disadvantages are overcome in accordance with the concepts of the present invention by providing, for dispensing material from a shipping container, a dispensing apparatus wherein the container functions as an integral part of the apparatus. In particular, for a shipping container which has a bottom end and a removable top cover, the apparatus comprises a supporting stand, a top retaining plate and a bottom retaining plate with the top plate adapted to be quick-clamped onto the top of the shipping container when the cover for the latter has been removed and the container is in position on the bottom plate. Provided in the top retaining plate is an air inlet valve which is coupled with a guide tube and ball valve, the guide tube being oriented axially with the axis of the shipping container. The guide tube and ball valve permit a puncture rod to be inserted through the top retaining plate and through the paste or fluid in the shipping container when the container is in position. An outlet connection is provided in the bottom retaining plate adapted to receive material forced from the shipping container, the apparatus further including a follower plate adapted to be placed on the top of the paste or fluid, following removal of the container cover.

In operation, the top is removed from the shipping container, the container is placed on the bottom retainer plate, and the top retainer plate is then located on the rim of the shipping container in non-sealed engagement with the latter. The ball valve is then moved to an open position, and the puncture rod is inserted through the ball valve and guide tube until it reaches the bottom of the container. A sharp blow on the end of the rod punctures the bottom of the container allowing paste access to the bottom plate outlet connection. The puncture rod is then removed, and the ball valve is turned to a closed position. The top plate is removed, and a follower plate is inserted in the shipping container and pushed down firmly against the fluid or paste therein. The top plate is then repositioned on the container and is clamped firmly against the container upper rim. Air under pressure is then admitted through the guide tube causing flow of the paste or fluid through the outlet connection. In a preferred embodiment of the invention, the follower plate is made of an elastomeric material, at least along the periphery thereof.

A principal advantage of the invention is that it permits use of the shipping container for dispensing without transfer of material therein to a special dispensing cylinder. Another advantage of the invention is that it permits the use of a special follower plate which can be used with inexpensive containers without requiring that each container be provided with its own follower plate. In this regard, the follower can have an elastomeric periphery which provides for better cleaning of the sides of the shipping container reducing paste or fluid loss. In addition, the follower plate prevents channeling of air around the edge of the plate and into the dispensing line. The follower plate is capable of movement until it is flush with the bottom of the shipping container for

substantially complete removal of paste or fluid from the container.

The invention is particularly useful for shipping containers of about the 2- to 5-gallon size, although clearly the invention can be adapted for use with shipping containers of larger or smaller sizes. The invention also is particularly useful in the dispensing of such materials as brazing pastes, which are relatively expensive requiring their relatively complete removal from the shipping container to avoid waste.

When the shipping container has been depleted, the follower plate impinges against the bottom of the container preventing air from emptying the dispensing gun and delivery line of paste or fluid. A paste flow stoppage is experienced, but no air emerges. It is a simple operation to shut-off the air, depressurize the apparatus and replace an exhausted container with a new filled container.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail a certail illustrative embodiment of the invention, this being indicative, however, of but one of the various ways in which the principles of the invention are employed.

In such annexed drawings:

FIG. 1 is an elevation, partial section view of a dispensing apparatus in accordance with the concepts of the present invention;

FIG. 2 is an elevation, partial section view of the apparatus of FIG. 1 showing a shipping container in place and penetration of the bottom of the container with a puncture rod in accordance with the concepts of the present invention; and

FIG. 3 is a partial, section elevation view again of the apparatus of FIG. 1 showing a shipping container in place and dispensing from the same in accordance with the concepts of the present invention.

Referring to the drawings, there is illustrated a dispensing apparatus **12**, in accordance with the concepts of the present invention, comprising a bottom retaining plate **14** and a a top retaining plate **16**, both made of relatively heavy plate steel. The bottom retaining plate is supported removed from the ground by a plurality of legs **18** fastened to the bottom plate by leg bolts **20**. Both of the plates are circular in shape, the bottom retaining plate having a slightly raised circular area **22** spaced from the edge of the plate providing a seat for a shipping container **24** (FIGS. 2 and 3). An annular shallow groove **25** in the raised area **22** engages an annular bottom rim of the shipping container serving to reinforce the seam at the bottom of the shipping container and to locate the shipping container axially on the bottom plate. FIGS. 2 and 3 show the shipping container filled with a material **26** to be dispensed, such as a brazing paste. The present invention is particularly applicable to the dispensing of a brazing paste of the type disclosed in U.S. Pat. No. 2,933,426 entitled, "Brazing Paste."

A cylindrical safety shield **28** is positioned around the shipping container **24** seated on flange **30** making up a peripheral surface of the bottom retaining plate. The safety shield embraces and seats against shoulder **32** between the surface **30** and the raised area **22** of the bottom plate.

The top retaining plate **16** is also provided with a central raised area **34** encompassed by a flange **36** making up a peripheral surface of the plate. An annular groove **38** extends around the raised area between said area and the flange **36**, and an O-ring seal **40** is positioned within the groove. This seal is shaped to seat on the upper lip **42** of the shipping container **24** when the top cover for the container is removed and the container is in place. A seal is established between the container and the top retaining plate by quick clamping the top plate downwardly against the container. This is accomplished by means of a plurality of spaced clamping bolts **44** which extend between the bottom retaining plate and the top retaining plate. In the embodiment of the present invention, four such bolts are employed at 90° intervals. The bolts are inserted in radial slots **45** in the bottom retaining plate which extend slightly inwardly from the periphery of the plate, the bolts having bolt heads **46** which engage the underside of the plate. Threaded nuts **48** on the upper ends of the bolts engage the upper surface of the top retaining plate, the latter having a plurality of radial slots **45** corresponding to those of the bottom retaining plate for receiving the bolts.

With the top retaining plate in position and clamped down against the upper lip of the shipping container, the safety shield **28** is dimensioned to leave a small gap between the retaining plate and the upper edge of the shield. In this way, the retaining plate seats against the shipping container and not the shield.

The purpose of the safety shield is to provide protection in the event the shipping container is defective and develops a leak. At spaced intervals around the bottom edge, the safety shield is provided with a plurality of apertures for draining leaked material and for cleaning purposes.

The bottom retaining plate **14** is provided, along its axis, with a tapped opening **54** into which is threaded a brass outlet connection **56**, the latter being sealed against the bottom of the retaining plate by an annular O-ring seal **58**. The outlet connection **56** is provided with an axial passage **60** which communicates with a brass nipple **62** which in turn is connected with a suitably valved delivery hose or other means (not shown).

The top retaining plate also is provided with a threaded opening **64** which is aligned with the opening **54** of the bottom plate when the top retaining plate is in place. This opening receives a threaded nipple **66** which is connected with a brass tee **68**. One leg of the tee is attached to a vinyl hose **70** which in turn is attached to a source of high pressure air, through air regulator **72**. Numeral **74** indicates an air pressure gauge attached to the regulator.

The other arm of the tee **68** is attached to a conventional ball valve **76** axially aligned with threaded openings **54** and **64** in the bottom and top retaining plates. The ball valve is movable from an open position to a closed position, and in the open position is adapted to receive puncture rod **78**, shown in FIG. **2**, which has a sharpened, pointed lower end **80** and a head **82** at the opposite end.

Also shown in the drawings, in FIG. **3**, is a follow plate **84**. It is shown as seated on the surface of the material **26** to be dispensed. The follow plate has an axial grab ring **86** for removal of the plate from the shipping container. It also has a somewhat thickened central portion and a thinner periphery capable of deflecting

against the walls of the shipping container. Preferably the follow plate at least in the periphery thereof is made of an elastomeric material.

The dispensing apparatus may be employed with a conventional manually operated trigger gun (not shown), or alternatively may be employed with an electropneumatic gun (also not shown) for metered flow. Both such means would be connected through suitable hosing with nipple **62** of outlet connection **56.**

In operation, a shipping container from which material is to be dispensed is placed on the bottom retaining plate engaged by the groove **25** provided in the retaining plate positioning the shipping container axially on the plate. The top of the shipping container is removed either before or after this step, and the top retaining plate is then positioned on the upper rim of the pail so that the O-ring seal **40** of the top retaining plate engages the container rim.

At this point, the top ball valve **76** is moved to its open position; and the puncture rod **78** is inserted through the ball valve, tee **68** and threaded nipple **66** until it reaches the bottom of the shipping container. The puncture rod is sized so that it has a slip fit within the nipple **66** and brass tee **68** whereby the latter guide the puncture rod keeping it in alignment with the threaded openings **54** and **64.** A sharp blow on the end of the puncture rod causes the latter to puncture the bottom of the shipping container exposing the passage **60** to the inside of the shipping container. At this point, the puncture rod is withdrawn; and the top retaining plate is removed. The follow plate **84** is then inserted in the top of the shipping container and pushed down firmly against the material within the container. The top retaining plate is repositioned on the rim of the shipping container, and the wing nuts **48** are tightened sealing the plate with the rim. At this point, an inlet air pressure valve (not shown) is opened and pressure regulator **72** is adjusted to increase the pressure to a valve up to **85** psi, depending upon the material to be dispensed.

During dispensing of the material within the shipping container, effective cleaning of the sides of the pail by the follow plate **84** is achieved. At the same time, the follow plate prevents channeling of air through the dispensing line in communication with outlet connection **56.**

When the shipping container has been depleted of material to be dispensed, the follow plate impinges against the bottom of the container. It fits sufficiently closely against the bottom of the container that essentially all of the material to be dispensed is forced from the container. At the same time, the bottom of the container is sealed so that air is not allowed to empty the dispensing gun and delivery line of dispensed material. A paste flow stoppage is experienced, but no air emerges. At this point, the air pressure is shut off and the ball valve is opened depressurizing the shipping container. The latter is removed from the apparatus to accommodate a new shipping container.

Having thus described the invention, what is claimed is:

1. An apparatus for dispensing viscuous materials such as brazing paste from a shipping container, the latter having a bottom end and a removable top cover, comprising:

a supporting stand;

a bottom plate supported by said stand against which the container bottom end seats;

a top cover plate;

seal means integral with the cover plate adapted to sealingly engages the upper rim of the container open end;

clamping means adapted to clamp the cover plate against the upper rim of the shipping container;

an air inlet means in the top cover plate;

said air inlet means including a guide tube perpendicular to the cover plate and valve means movable between open and closed positions to open and close the guide tube;

puncture rod means for inserting through said guide tube when in the open position for puncturing the container bottom, said rod means being removable following puncture of the container bottom;

a dispensing connection in the bottom plate adapted to be in sealed engagement with the puncture opening formed by said puncture rod means;

and follow plate means insertable after removal of the puncture rod means within the container open end, said follow plate means being in wiping engagement with the shipping container inner walls and movable to the container bottom into a position for substantially complete removal of the material being dispensed and for sealing the puncture opening.

2. The apparatus of claim **1** wherein said follow plate is of an elastomeric material.

3. The apparatus of claim **2** wherein said air inlet valve means is a ball valve adapted to receive said puncture rod means when in the open position.

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