Aug. 9, 1966 K. E. GUEST 3,265,248

WIPING ACTION DISPENSING STRUCTURE

Filed July 16, 1965

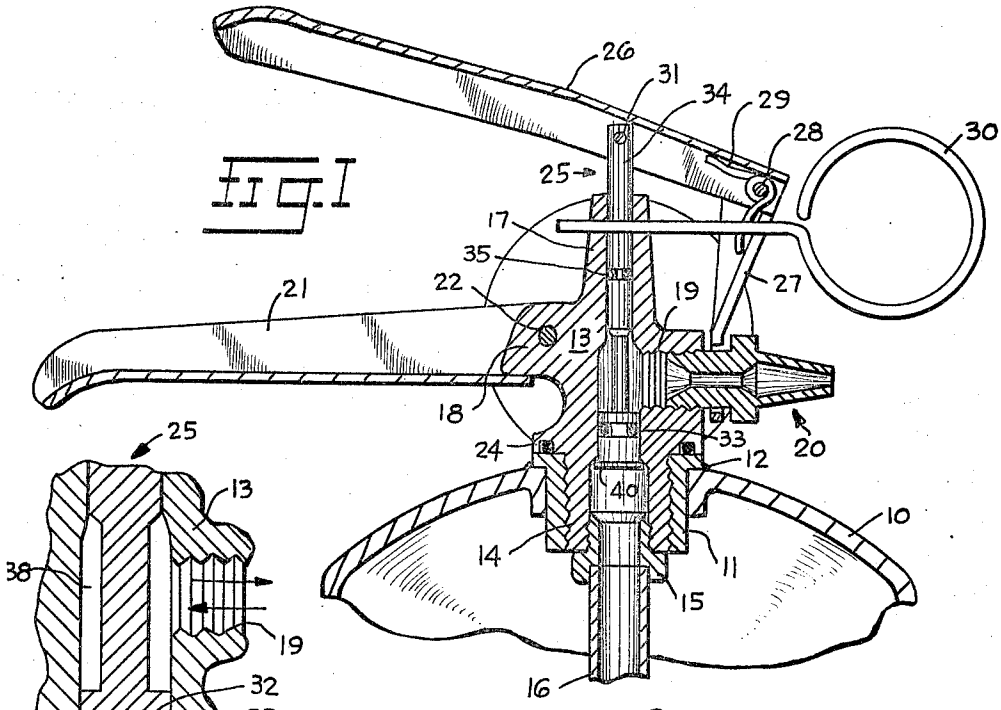

Fig. 1

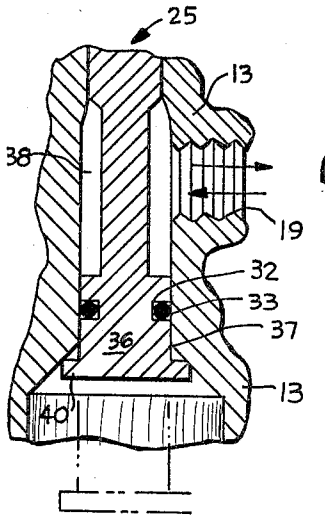

Fig. 2

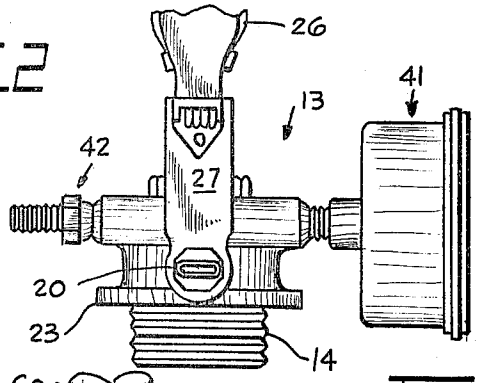

Fig. 3

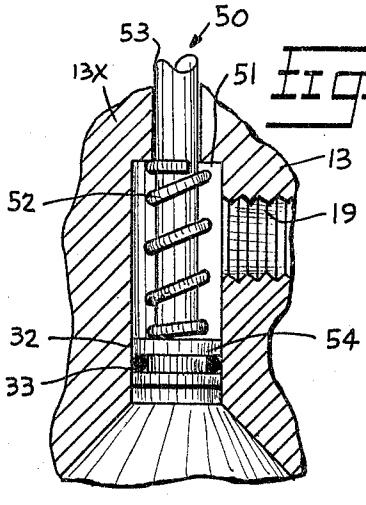

Fig. 4

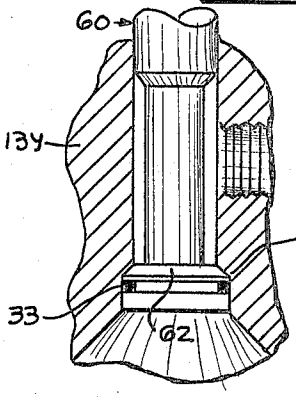

Fig. 5

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WIPING ACTION DISPENSING STRUCTURE

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1 Claim. (Cl. 222—4)

This invention relates to an intermittent use dispensing structure for dispensing dry powder and more particularly to a valve for dispensing dry powder having a wiping action means therein for wiping clean the conduit walls to thereby effect a gas tight valve seat.

It is an objective of this invention to provide a valve for use in dispensing dry powder fire extinguishing chemicals having wiping means therein for effecting a gas tight seat to the conduit walls used in transporting said dry powder.

This and other objects of this invention will become apparent upon reading the following descriptive disclosure taken in conjunction with the accompanying drawing in which;

FIG. 1 is a side section view, broken away in part, of the valve disposed on a tank for holding dry powder fire extinguishing chemicals at high pressures,

FIG. 2 is a detail view of the valve plunger in seated position and showing in outline the position of the plunger in dispensing position,

FIG. 3 is a front view of the valve showing the dispensing spout,

FIG. 4 is a detail section view of a modified plunger having spring loaded means for arresting the return travel of said plunger, and

FIG. 5 is a detail section view of another modified plunger and showing a co-acting valve seat.

Turning to the drawing, a conventional cylindrical tank **10** for holding dry powder fire extinguishing chemicals under elevated pressures is provided with a circular opening in which an internally threaded cylindrical connector means **11** is secured in a gas tight manner by means of welding **12**.

An important feature of this invention, is the provision of a valve housing **13** having a centrally disposed cylindrical borehole of varying diameter therein.

The housing **13** is provided with a depending annular portion **14** having exteriorly disposed screw threads for engaging the co-acting threads disposed on the connector means **11**. The interior of the housing portion **14** is provided with screw threads for engaging a conventional syphon tube nut **15** having a syphon tube **16** secured thereto.

The housing **13** is further provided with an upright portion **17** through which the borehole passes. A projecting rectangular stud **18** is provided to the rear of the housing. A screw threaded lateral passageway **19** is provided in the front wall of the housing, connecting the central borehole to the atmosphere. A conventional horn spout **20** having a screw threaded nib is threaded into the passageway **19**. A U-shaped handle of stamped metal **21** is secured rigidly to stud **19** by means of a pin **22**.

The housing **13** is provided with a circular flange **23** having a circular channel therein and an O-ring **24** therein for bringing about a gas tight joint with the lip of the connector means **11**.

A plunger **25** is disposed in the central borehole so as to protrude beyond the upright portion **17**. A conventional handle **26** is provided with a conventional front spacer plate **27** having a aperture through which the nib of the spout **20** passes thereby locking the spacer plate to the housing **13**. The spacer plate **27** is secured hingedly to the handle **26** by means of a pivot pin **28** and a suitable spring **29** having extending ends is disposed on pin **28** to continuously urge handle **26** away from the spacer plate **27**.

As shown in FIG. 1, a conventional safety pin **30** is disposed between the spacer plate **27** and spring **29** and into an aperture provided therefor in the upright portion **17** of housing **13** and in the plunger **25**. The top of the plunger **25** is secured pivotally to the handle **26** by means of a pivot pin **31**.

A significant feature of this invention is the provision of a circular channel **32** in the bottom of the plunger **25** (FIG. 2) and the provision of an O-ring of resilient plastic material to form a wiping sliding action against the inner wall of the central borehole while maintaining a gas tight valve seat during the entire wiping procedure.

In the plunger modification shown in FIGS. 1 and 2, the central borehole is provided with a small top diameter communicating with a larger central borehole section of intermediate diameter, which latter in turn communicates with the bottom borehole section of largest diameter. The plunger **25** is provided with a top cylindrical section **34** of relatively small diameter having a circular channel in which a resilient plastic O-ring **35** is disposed. The plunger section **34** co-acting with the O-ring **35** prevents passage of dry powder chemicals through the top of the central borehole.

The center of the plunger **25** is provided with a section of least diameter and this section is disposed in the borehole section of intermediate diameter to provide a chamber to effect a uniform mixing of the gas and dry powder in the housing **13** before being dispensed at the spout **20**.

The bottom of the plunger is provided with an enlarged diameter section **36** containing the O-ring **33** in its channel **32** and disposed in close proximity to the borehole wall of largest diameter.

According to this invention the plastic O-ring **33** functions simultaneously as a wiping blade and also as a valve seat. Thus to operate the extinguisher (FIG. 1), the safety pin **30** is pulled and the plunger **25** is depressed toward the syphon tube **16** by moving handle **26** toward stationary handle **21** until O-ring **33** is disposed below the circular edge **37** (FIG. 2) whereupon the dry powder fire extinguishing chemicals, for example sodium bicarbonate, are propelled by the high gas pressure in the tank **10** up the syphon tube and into the valve housing mixing chamber **38** of the central borehole. The mixed cloud of chemicals is then directed upon the fire by means of the spout **20**.

After the fire is extinguished the hand grip on the handles **21** and **26** is released causing the spring **29** to push the handle **26** upwardly until the O-ring **33** engages the adjacent surface of the bottom of the borehole whereupon the gas pressure in the tank and syphon tube help push the plunger **25** upwardly, FIG. 1 and 2. The upward movement of top portion of the O-ring **33** on the powder covered walls of the borehole sweeps the borehole clean by a wiping action so that the central portion of the O-ring produces a gas tight seal with a powder-free borehole surface making the extinguisher ready for subsequent use without refilling. As shown in FIG. 2 the bottom of the plunger **25** is provided with a circular stop arresting flange **40** which limits the upward movement of the plunger and thereby permits alignment of the apertures in both the upright housing portion **17** and plunger portion **34** to permit insertion of the safety pin **30**.

As shown in FIG. 3, the houisng **13** is provided with conventional gauge means **41** and conventional recharging means **42** having conventional conduits communicating through the housing element **17** with the interior of the tank **10**.

A modified plunger **50** is shown in FIG. 4 which co-acts with a modified housing **13X** having a modified borehole providing a horizontal ledge **51** for an arresting coil spring **52**. In the modified plunger **50**, the plunger is provided with a relatively long top cylindrical segment **53** integral with a short bottom segment **54** containing a channel **32** and a plastic resilient O-ring **33**. In this modification a suitable coil spring **52** is substituted for the arresting flange **40** of the plunger **25** to effect an arresting of the upward plunger movement.

In FIG. 5 there is shown another modification wherein a modified housing **13Y** is provided with a central borehole having a long top portion and a short beveled bottom portion of larger diameter. The plunger **60** is provided with an intermediate section of lesser diameter than the top and bottom sections to provide the aforesaid mixing chamber. In this modification the borehole is provided with a beveled surface **61** and the bottom of the plunger **60** is provided with a co-acting beveled surface **62**. In this modification the arresting of the upward movement of the plunger in the borehole is effected by engagement of the surfaces **61** and **62**.

Whenever a tank **10** becomes empty of dry powder fire extinguishing chemicals, it is readily refilled by introducing more dry chemical fire extinguishing chemicals throught aperture **19** (FIG. 2) and then the tank is recharged by introducing gas at suitable pressure into the tank through a conventional tire valve **42**.

This invention has for its generic concept the provision of wiping means to effect a simultaneous cleaning and valve sealing of a dusty passageway and accordingly is not limited to the illustrative embodiments herein showing this concept in use.

I claim:

An intermittent selectively operated dispensing structure for dispensing fire extinguishing chemicals from a tank under high pressure comprising a valve housing having a central borehole therethrough consisting of a top relatively long borehole portion of smallest diameter, a relatively short intermediate borehole portion of larger diameter and a bottom borehole portion of largest diameter, said housing having a lateral aperture communicating near the bottom of the smallest borehole portion and with the atmosphere, an integral plunger having a top portion of a diameter substantially that of diameter of the smallest borehole portion, an intermediate plunger portion of least diameter disposed in a portion of the borehole to form a mixing chamber, and a bottom plunger portion disposed in the intermediate borehole portion, said bottom plunger portion having a circular groove, and a plastic resilient O-ring disposed in said groove and in gas tight sliding-wiping relationship to the intermediate borehole portion wall surface whereby said intermediate borehole wall surface is wiped free of dry powder to form the gas tight seal.

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