Sept. 18, 1956 T. J. BAGAROZY 2,763,415

FILLING HEAD

Filed May 27, 1955

Fig. 2.

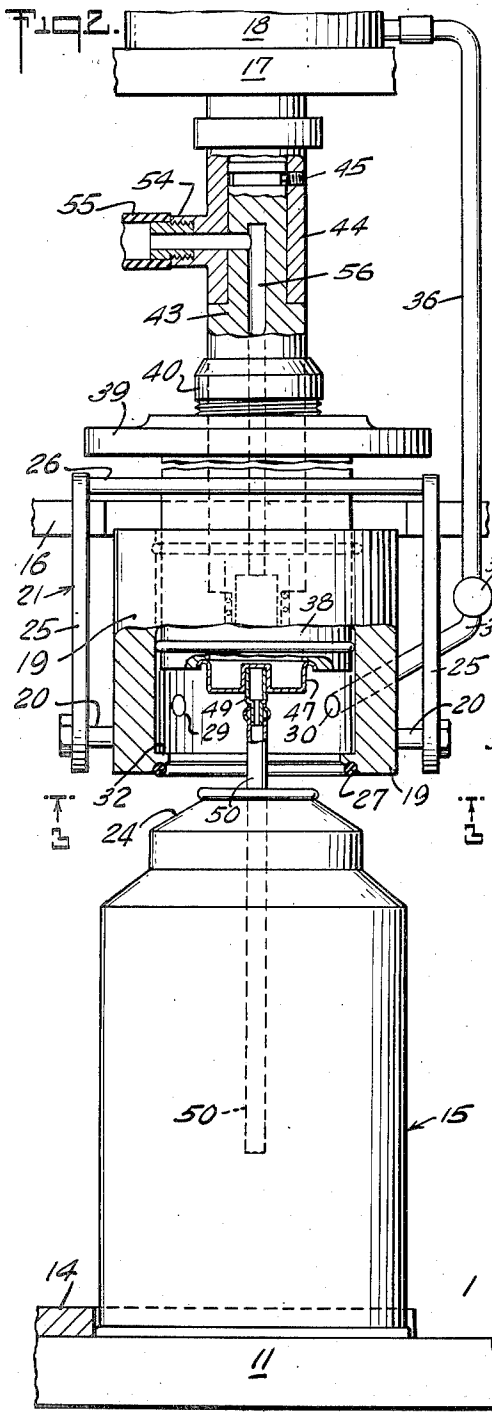


Fig. 3.

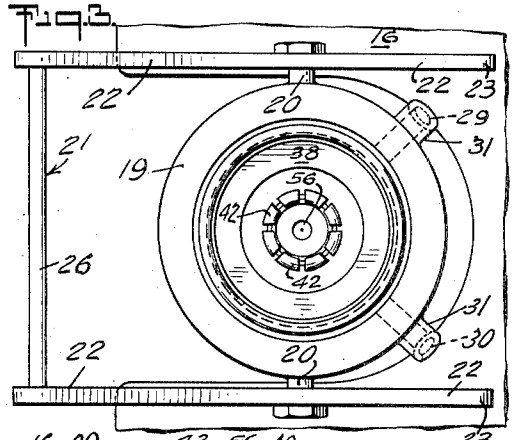


Fig. 4.

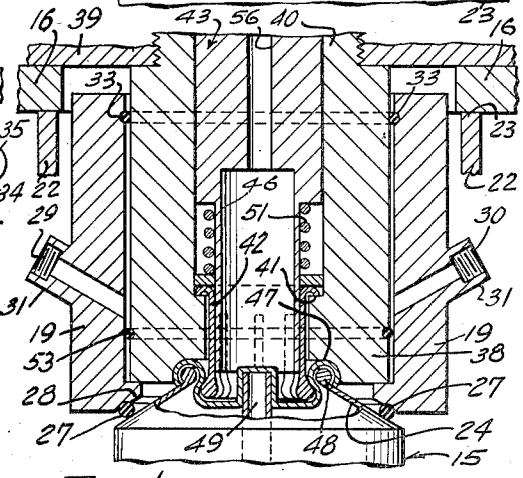
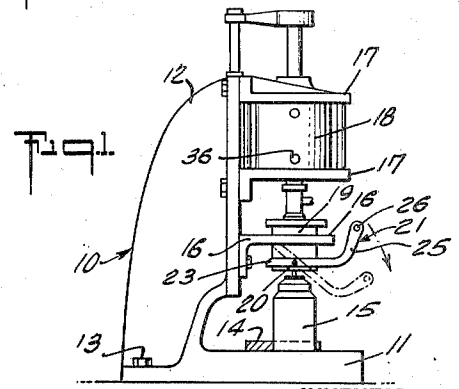


Fig. 1.



INVENTOR.
TULLY J. BAGAROZY

BY
Frank Mokara
ATTORNEY

United States Patent Office 2,763,415 Patented Sept. 18, 1956

2,763,415

FILLING HEAD

Tully J. Bagarozy, Bronx, N. Y.

Application May 27, 1955, Serial No. 511,571

4 Claims. (Cl. 226—68)

This invention relates to a filling head and more particularly to a filling head adapted to fill pressure resistant containers with high pressure gas.

It is an object of this invention to provide a filling head for filling pressure resistant containers with high pressure gas.

It is another object to provide an apparatus adapted to fill high pressure resistant containers consistently with a high pressure gas of a given pressure.

It is another object to provide a filling head of inexpensive construction and efficient operation.

These and other objects of this invention will become apparent upon reading the following disclosure of an illustrative embodiment taken in connection with an accompanying drawing in which:

Fig. 1 is a side view of the complete machine.

Fig. 2 is a detailed view broken away in part to show the manner of lowering a syphon tube into a container by the filling head.

Fig. 3 is a view taken on line 3—3 of Fig. 2 and

Fig. 4 is a sectional view of the filling head showing the high pressure gas inlet and outlet openings in opposed relationship for purposes of simplification.

Referring to the drawing a substantially L-shaped support **10** having an integral base plate **11** and a vertical member **12** is bolted to a work table by conventional bolts **13**.

The base plate **11** is provided with a V-shaped or U-shaped cut-out element **14** adapted to center a high pressure resistant container **15**.

The vertical member **12** is provided with a fixedly secured table piece **16** and a conventional pair of brackets **17** to hold a conventional gas operated cylinder piston **18**.

The table **16** is provided with a substantially U-shaped cut-out to receive a filling head including a cylindrical collar **19** (Fig. 2).

The filling head proper comprises the manually depressed cylindrical collar **19**, which collar may be depressed by hydraulic, pneumatic or electrical means if desired. Where manual depressing or lowering of the collar **19** upon the shoulder of container **15** is effected the collar is provided with a pair of diametrically opposed pivot pins **20**. A manually operated rocker member **21** is secured to these pins **20**.

The rocker member **21** consists of a pair of spaced-apart lever arms **22** of suitable lengths and having the pivot pins **20** disposed substantially in the center of the lever arm length thereby permitting contacting of the free ends **23** of the lever arms against the bottom surface of fixed table piece **16** (Fig. 3) and the consequent lowering of the collar **19** onto the appropriate shoulder **24** of container **15**.

The rocker member **21** is provided with upright elements **25** which are preferably integral with each of the lever arms **22** at the end away from the free end **23** (Fig. 1). A hand bar **26** is secured to top of elements **25**. As shown in Fig. 1 downward pressure on bar **26**

causes the bar to rotate on pins **20** until table **16** is engaged by lever ends **23**. Further downward rotation of the rocker member causes the collar to slide down and the upright elements **25** to become horizontally disposed and to straddle container **15** whereby the collar **19** is clamped hermetically to the container shoulder **24** by sealer ring **27** of rubber disposed in the bevel surface **28** of the collar mouth.

The collar **19** is provided with a gas inlet port **29** and a gas exit port **30**. The ports **29** and **30** pass through screw threaded hose retaining studs **31** to which conventional flexible high pressure resistant conduit is attached.

The collar **19** is provided with an inner circular seating ledge **32**. The rubber sealer ring **27** is fixedly secured by press fitting into a suitable groove disposed in the beveled surface **28**. Optionally the inner cylindrical surface of the cylindrical collar **19** is provided with a second groove in which a second sealer ring **33** of rubber is disposed.

The device of this invention is used to introduce inert gas such as nitrogen gas into a container containing sodium bicarbonate dry powder for fire extinguishing purposes. The gas pressure preferred is about 150 pounds per square inch.

In order to be certain that 150 pounds of gas pressure are in each container at the time of sealing, the sealing is effected at this pressure by having the exit nitrogen gas pass through port **30** and flexible conduit **34** into a conventional preset valve **35** set to operate at 150 pounds and thence to conduit **36** whence the 150 pounds pressure gas is conducted into cylinder piston **18** where it trips and sets the can sealing operation in motion.

The can sealing mechanism may be of conventional manufacture using mechanical fingers to grasp and hold a conventional syphon tube insert assembly but preferably the mechanical grasping of the syphon tube insert is assisted by use of vacuum.

In the conventional syphon tube grasping and sealing a movable tubular member **38** is fixedly secured to a skirt flange **39** and a throat element **40**. The tubular bore of member **38** is provided with a shoulder or shelf **41** on which a plurality of conventional closure fingers **42** are disposed in a conventional circular manner.

A plunger rod **43** which may be a solid rod mounted for reciprocal motion, or preferably a plunger tube modified to effect a vacuum grasping of the syphon tube insert is secured to the arbor **44** by means of a set screw **45**.

The plunger rod **43** is provided with a conventional tubular collet **46** which in downward movement causes the bulbous ends of fingers **42** to expand and be disposed in under lip relationship to the insert **47** and container mouth **48** thereby sealing the conventional insert **47** and its frictionally held syphon tube holder **49** to syphon tube **50**.

The plunger **43** is spring loaded by coil spring **51** disposed conventionally thereabout. The tubular member **38** is provided with an exteriorly disposed groove adjacent its bottom and a sealer ring of rubber **53** is disposed in said groove.

As shown in Fig. 2, the arbor **44** is modified by means of a lateral port stud **54** which is secured to a vacuum line conduit **55**.

In the operation of the vacuum modified device of this invention the can insert **47** and its syphon tube **50** as an assembled unit is picked up by the fingers **42** assisted by the vacuum in tubular bore **56** and the assembled insert is lowered into container **15**.

Next the rocker arm **21** is lowered bringing collar **19** in hermetically sealed relationship to container **15**. Next nitrogen gas is introduced at 150 pounds per square inch through port **29** into the container **15** and after the container is filled with gas the 150 pounds pressure operates

pre-set valve **35** and then cylinder piston **18**. Movement of piston **18** causes arbor **44** and the tubular plunger **43** and the frictionally held tubular member to move downwardly until flange plate **39** strikes table plate **16** which latter is fixedly secured. Thereafter further downward movement of member **38** is stopped but rod **43** continues to move causing collet **46** to push the fingers **42** outwardly to seal insert **47** to container **15** about the mouth **48**, meanwhile compressing spring **51**.

Upon the completion of the plunger stroke of plunger **43**, the gas in cylinder piston **18** is discharged and the coil spring returns the rod **43** upwardly along with the member **38** frictionally held thereto. Next rocker arm **21** is released and the sealed gas filled container is removed. Thereupon another can **15** is placed in position in element **14** and another assembled can insert **47** with syphon tube attached is secured to the fingers **42** and the cycle is repeated.

As stated previously, vacuum operation is optional as mechanical grasping is fully operable. However, the use of vacuum prevents the occasionally dropping of inserts due to mechanical slipping.

Also the rocker arm may be operated on a timed cycle mechanically operated basis in conjunction with a timed mechanical insertion of containers below collar **19**.

While this invention was described by means of an illustrative embodiment other embodiments within the scope of this disclosure will now become readily apparent to those skilled in this art. However, all these obvious variations are intended to be embraced within the claims appearing herein.

This filling head invention also includes the method of filling a pressure resistant container with high pressure gas. It is not to be limited to filling containers having only dry powder fire extinguishing material therein for it is operable also with any dry powder and even with containers partly filled with liquid to be dispensed by the high pressure gas introduced.

I claim:

1. A device for filling containers with high pressure gas comprising a support having a table and a piston having a plunger arbor disposed thereover, a plunger rod having a tubular bottom secured to said arbor, a tubular member having an inner shelf disposed frictionally about said plunger rod, a plurality of closure fingers secured to said shelf, said tubular member having an exterior groove, a sealer ring disposed in said exterior groove of said tubular member, a collar disposed about said tubular member and having apertures for inlet and outlet of gas and provided with a beveled inner surface having a circular groove therein, a sealer ring disposed in said groove, a pair of spaced-apart pivot pins secured to said collar, and a rocker element having lever arms secured to said pivot pins for clamping said collar to said container in air-tight relationship.

2. The apparatus of claim 1 having a pre-set valve secured to the gas outlet port of said collar and conduit means for conveying the high pressure gas from said valve to said piston.

3. The device of claim 2 wherein said plunger rod is tubular and wherein means for forming a vacuum are connected to the tube of said plunger rod.

4. The device of claim 1 wherein the collar is provided with a groove at its inner top surface and a sealing ring disposed in said groove.

References Cited in the file of this patent

UNITED STATES PATENTS

28,424	Twing et al.	May 22, 1860
1,790,787	Badger	Feb. 3, 1931
2,014,597	Staley	Sept. 17, 1935
2,155,397	Brandon	Apr. 25, 1939