July 26, 1955 L. E. JUENGLING 2,713,872

VALVE PROTECTING CAP FOR PRESSURIZED FLUID CONTAINERS

Filed May 5, 1952

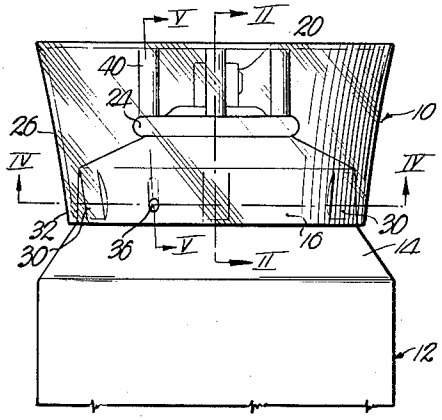


Fig. 1.

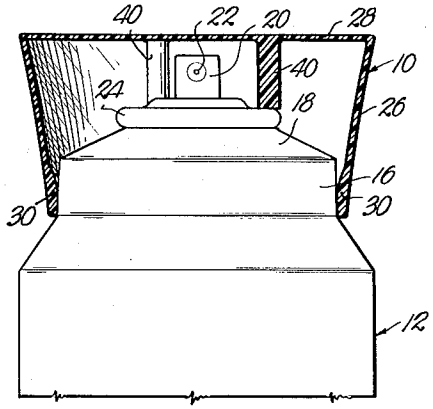


Fig. 2.

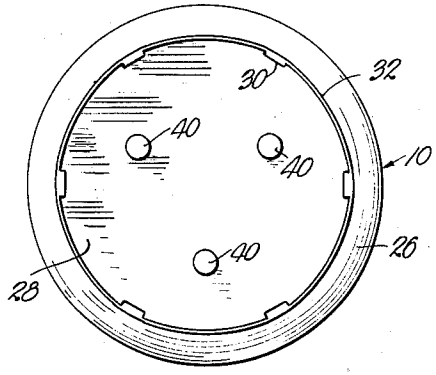


Fig. 3.

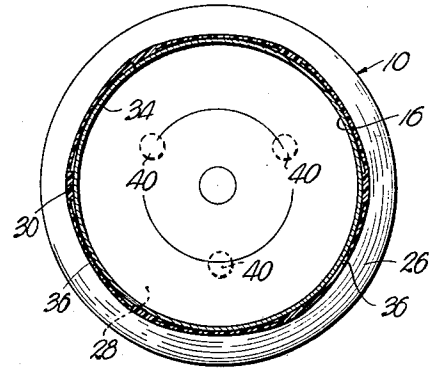


Fig. 4.

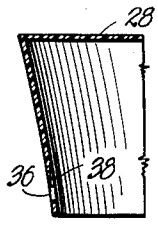


Fig. 5.

INVENTOR.
Leonard E. Juengling
BY
Joel Hovey
ATTORNEY.

United States Patent Office

2,713,872

Patented July 26, 1955

2,713,872

VALVE PROTECTING CAP FOR PRESSURIZED FLUID CONTAINERS

Leonard E. Juengling, Kansas City, Kans., assignor to Cook Chemical Company, Kansas City, Mo., a corporation of Missouri

Application May 5, 1952, Serial No. 236,181

3 Claims. (Cl. 137—382)

The invention relates to cap structure for use with receptacles of the kind having a manually operable valve of the type including a reciprocable plunger for releasing the pressurized contents of the container, the primary object being to provide a cap that is easily removed and replaced and, more particularly, one that is fully capable of at all times protecting the valve during packaging, storage and shipment.

It is the most important object of the present invention to provide a cap of resilient, somewhat pliable material, that includes a frusto-conical side wall, together with bosses disposed to frictionally engage the neck portion of the container upon which the cap is mounted, and to deform one edge of the side wall so as to bring the same into direct contact with the said neck at a number of points therearound.

Another important object hereof is to provide a cap having the aforesaid configuration in the side wall thereof, together with a flat top wall closing one end of the side wall and having a plurality of depending pins engagable with a part of the container to hold the top wall in spaced relationship to and above the valve plunger.

Other objects include the way in which the above mentioned bosses are shaped to present an arcuate face that engages the neck of the container to facilitate removal and replacement, and the way in which leaking fluid from the container is evacuated from the cap.

In the drawing:

Figure 1 is a fragmentary, side elevational view of a pressurized fluid container having a valve protecting cap made pursuant to the present invention, mounted thereon.

Figure 2 is a fragmentary, cross-sectional view taken on line II—II of Fig. 1.

Fig. 3 is an inverted plan view of the cap.

Fig. 4 is a cross-sectional view taken on line IV—IV of Fig. 1; and

Fig. 5 is a fragmentary, cross-sectional view taken on line V—V of Fig. 1 showing the cap removed from the container.

The cap forming the subject matter of the present invention is broadly designated by the numeral **10**, and is particularly adapted for mounting upon a container **12** for a pressurized fluid such as insecticides. This container is of the conventional, commercial type and is fully shown in U. S. Letters Patent No. D. 158,332. Container **12** has a neck **14** of reduced cross-sectional area that includes an annular band portion **16** above which is provided a dome-like, uppermost end **18** that mounts valve structure to be protected by the cap **10** hereof. Such valve structure is of conventional character and includes a vertically reciprocable plunger **20** which, when depressed downwardly against the action of a spring forming a part of the valve, permits escape of the pressurized fluid from an outlet port **22** in the plunger **20**. The importance, therefore, of protecting the plunger **20** so that the same is not accidentally depressed and the fluid therefore, permitted to escape, becomes readily apparent.

The dome portion **18** of the neck **14** has an annular bead **24** that is utilized as will hereinafter be made clear to cooperate with the cap **10** in the protection of the plunger **20**.

Cap **10** is preferably formed entirely from a resilient, somewhat pliable material such as plastic. Any of the well-known synthetic resins may be used and the cap **10** chosen for illustration, is fully transparent. It includes a side wall **26** that is frusto-conical and normally disposed with its base end upwardly, the latter in turn being closed by a flat top wall **28**. The lowermost apex end of the frusto-conical side wall **26** is open and has an inside diameter that is slightly greater than the outside diameter of the band portion **16** of neck **14**.

There is provided a plurality of elongated bosses **30** on the innermost face of the side wall **26** at the lowermost marginal edge thereof and extending upwardly from the lowermost annular edge **32** of wall **26**. As illustrated in Fig. 2 of the drawing, the innermost faces of the bosses **30** are longitudinally arcuate and engage the annular band portion **16** of neck **14** transversely thereof. A relatively tight, frictional fit is provided so that when the cap **10** is forced in place over the band **16**, the lowermost marginal edge of the side wall **26** will be deformed into a substantially polygonal configuration as depicted by Fig. 4 of the drawing. Such deformation of the side wall **26** adjacent its lowermost edge, causes the side wall **26** to engage the band **16** at a plurality of points **34** between the embossments **30** throughout the circumference of the band **16**. The fit has been found to be so tight around the band **16** that it becomes necessary in order to adequately discharge any fluid leakage from around the plunger **20**, to provide a plurality of openings **36** in the side wall **26**. Openings **36** are adjacent the band **16** when the cap **10** is in place upon the container **12** and therefore, a groove **38** is formed in the innermost face of the side wall **26** extending upwardly from each opening **36** respectively to channel the leakage from within the cap **26** to the openings **36**.

In packaging containers and caps of this type, as well as in storage of the same, it is advantageous to stack the units one on the other and by virtue of the flexibility of top wall **28**, its downward deflection is prevented by means of a plurality of pins **40**, depending from the top wall **28** and engaging the bead **24** on the dome portion **18** of neck **14**. Manifestly, the pins **40** are longer than the distance between the uppermost edge of the bead **24** and the upper end of plunger **20**. Consequently, the top wall **28** is always held in spaced-relationship to the plunger **20** thereabove. The pins **40** not only hold the top wall **28** from downward movement, but serve to cooperate with that portion of the neck **14** below band **16** in keeping the cap **10** from downward movement with respect to the container **12**.

It is now apparent that through the construction herein provided, it is possible to produce an inexpensive, protecting means that is sufficiently pliable as to assure a relatively tight frictional grip on the band **16** and at the same time, adequately protect the plunger **20** notwithstanding its flexible pliable nature. The cap **10** will not become accidentally displaced from the container **12**, will adequately support a plurality of additional containers thereabove; is attractive in its very uniqueness; and by virtue of its frusto-conical shape with the base end thereof upwardly, it can be easily grasped and therefore, pulled from and replaced upon the container **12**.

Therefore, while it is manifest that various types of cap constructions have heretofore been provided for sundry purposes, the cap **10** herein illustrated and described has many advantages emanating from the improved features thereof, and it is desired to be limited

only by the spirit of the invention as defined by the scope of the appended claims.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. Structure of the kind described comprising a pressurized fluid container having an annular neck portion and a valve normally closing the normally uppermost end of the container above said neck portion; and a valve-protecting cap including a frusto-conical side wall, a top wall closing the base end of said side wall, the opposite end of the side wall being open and surrounding said neck portion, means on the innermost face of the side wall adjacent said open end frictionally engaging said neck portion, and a plurality of pins depending from the innermost face of said top wall and engaging the container in spaced relationship to the valve for limiting the extent of movement of the top wall toward the valve, said top wall being flat, presenting a support when stacking a plurality of said structures.

2. Structure of the kind described comprising a pressurized fluid container having an annular, band-like neck portion, a valve normally closing the normally uppermost end of the container and having a plunger extending upwardly therefrom above the neck portion, and a circular bead surrounding the valve; and a valve-protecting cap of resilient material including a frusto-conical side wall, a top wall closing the base end of said side wall, the opposite end of the side wall being open and surrounding said neck portion, means on the innermost face of the side wall adjacent said open end frictionally engaging said neck portion, and a plurality of pins depending from the inermost face of the top wall and engaging said bead for limiting the extent of movement of the top wall toward the plunger, said top wall being flat, presenting a support when stacking a plurality of said structures.

3. Structure of the kind described comprising a pressurized, fluid container having a cylindrical, flat base, a neck having an annular band portion of reduced diameter, and a manually manipulable valve normally closing the normally uppermost end of the container above said band portion, said valve being openable by downward pressure thereon; and a valve protecting cap including an inverted, open ended, frusto-conical, side wall, a top wall closing the larger end of the side wall, the smaller, opposite end of the side wall being of substantially the same inside diameter as the outside diameter of said band portion and surrounding the same in telescoping relation therewith, and means on the innermost face of the side wall adjacent said smaller end for frictionally engaging said band portion when in such telescoped relationship, said top wall being flat and of substantially the same diameter as the base of the container to present a support for an overlying structure when stacking a plurality thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

214,410	Lockwood	Apr. 15, 1879
1,659,648	Tormo	Jan. 12, 1926
1,898,654	Breslauer	Feb. 21, 1933
2,031,172	Maloney	Feb. 18, 1936
2,086,188	Punte	July 6, 1937
2,465,083	Gradisar	Mar. 22, 1949
2,544,095	Kower	Mar. 6, 1951
2,612,293	Michel	Sept. 30, 1952