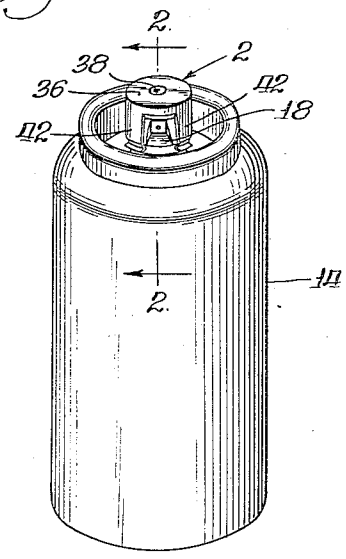
July 1, 1958 N. W. SEAQUIST 2,841,443

VALVE ACTUATOR CAP

Filed Jan. 21, 1954

Fig. 1



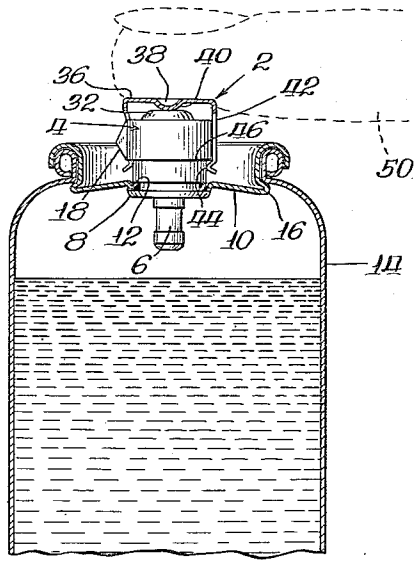


Fig. 2.

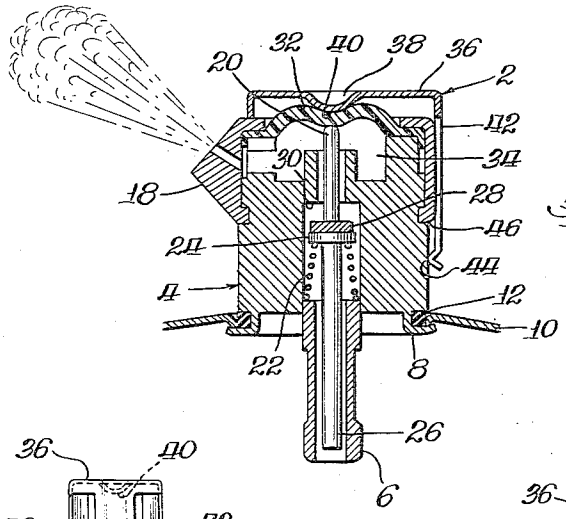


Fig. 3.

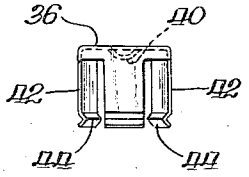


Fig. 4.

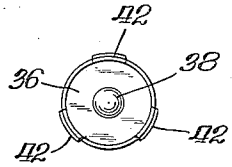


Fig. 5.

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VALVE ACTUATOR CAP

Nels W. Seaquist, Lakewood, Ill.

Application January 21, 1954, Serial No. 405,361

1 Claim. (Cl. 299—95)

This invention relates to valves of the aerosol bomb type and more particularly to a novel actuator cap for a valve wherein the valve stem is manually manipulated to open position through a resilient diaphragm which seals the external end of the valve body and thus conceals the stem.

According to prior art practices, such valves have been actuated by an operator's finger pressing on the diaphragm to open the valve stem. However this practice is not only tiresome to the operator but also requires excessive pressure against the diaphragm due to the fact that pressure by the finger is delivered to the entire diaphragm rather than to the portion thereof directly aligned with the valve stem.

Prior art attempts to solve this problem have not been satisfactory inasmuch as prior art actuator caps have been bulky and expensive and have not concentrated pressure at the diaphragm portion which is directly aligned with the valve stem.

Furthermore, such prior art caps have been mounted on the end of the bomb or container and have required that the cap itself be deflected to engage the diaphragm, thereby necessitating greater pressure than that required to deflect the diaphragm without such a cap.

Accordingly, a primary object of the present invention is to devise a novel actuator cap which may be removeably mounted on the valve body thereby affording a compact simple cap which is more convenient and economical than prior art caps mounted on the end of the bomb.

Another object of the invention is to devise a cap which slides on the valve body and does not require that the operator deflect the cap itself to actuate the valve stem to open position.

Still another object of the invention is to accommodate quick and convenient assembly and disassembly of the cap, so that the latter may be removed when the bomb is not in use, inasmuch as slight pressure accidentally imposed on the novel cap, as for example during shipment thereof, might accidentally cause discharge of the bomb.

A further object of the invention is to concentrate pressure delivered by the cap at the center of the diaphragm and in alignment with the valve stem, so that much less pressure is necessary to open the stem than that required with or without prior art caps.

The foregoing and other objects and advantages of the invention will become apparent from the following specification and the accompanying drawing, wherein:

Figure 1 is a perspective view of an aerosol bomb with the novel cap assembled therewith;

Figure 2 is a sectional view of the cap and bomb on line 2—2 of Figure 1;

Figure 3 is a sectional view through the cap and valve;

Figure 4 is a side elevational view of the cap; and

Figure 5 is a bottom plan view of the cap.

Describing the invention in detail the novel cap generally designated 2 is illustrated in Figures 1–3, as applied to a valve body 4 having an inlet nipple 6 with a flange 8 crimped against the inner side of a head 10 to compress

a resilient gasket or seal 12 around the perimeter of an opening in said head receiving said valve body.

The head 10, as illustrated, is sealed to one end of a container 14 as for example by crimping as at 16; however, it will be understood that the construction of the head 10 and valve body 4 are not per se part of the invention and may be modified as desired.

The valve body 4 is provided with a conventional nozzle 18 through which gas or liquid under pressure in the container 14 may be released upon actuation of a valve stem 20 (Figure 3) which normally is held closed by the pressure in the container 14 and by a compression spring 22 acting on a head 24 of a stem 26 in the nipple 6.

The head 24 bears against the underside of a resilient seat 28 carried by the lower end of the stem 20, said seat being engageable with a complementary seat 30 of the valve body in the closed position of the stem 20 to cut off flow of fluid from the inlet nipple 6 to the nozzle 18. The top of the valve body 4 is sealed by a resilient diaphragm 32 which conceals the stem 20.

In open position of the stem 20, illustrated in Figure 3, with the diaphragm 32 deflected to open the stem seat 28, fluid under pressure in container 14 may pass through the nipple 6, past the seats 28 and 30 and into an outlet chamber 34 (Figure 3) of the valve body 4 which chamber communicates with nozzle 18 and is sealed by the diaphragm 32.

The novel actuator cap 2 comprises a preferably flat top plate or web 36 having a dimple 38 in the top side thereof which forms a knob or projection 40 on the underside of the plate 36 approximately centrally thereof.

The plate 36 is provided with a plurality of legs 42 which are preferably integral with plate 36 and are provided on their lower ends with tits or lugs 44 engageable with a shoulder 46 of the valve body to prevent accidental disassembly of the cap 2 therefrom.

The legs 42 are preferably integral with the plate 36, and their connection thereto is preferably resilient, as for example by forming the entire cap of metal or plastic having sufficient resiliency to hold the tits 44 snugly against the valve body and to permit sufficient resilient deflection of the legs so that the cap 2 may be slipped on and off the top of the valve body.

Preferably the cap 2 is formed of a thin sheet of metal so that the user may manually effect permanent deformation of the legs 42 to provide any desired spacing between the tits 44 thereby adjusting the cap to the particular valve body; however, after such deformation, the legs are resiliently deflectable sufficiently to permit the tits to pass over the shoulder 46 in assembling or disassembling the cap with respect to the valve body.

In the preferred embodiment of the invention three legs 42 are provided; however, it will be understood that any desired number of legs may be connected to the plate 36, provided that two of the legs straddle the nozzle 18, as best seen in Figure 1, to accommodate slideable movement of the tits 44 along the valve body 4, as the cap is urged to the position shown in Figure 3, whereat the stem 20 is opened.

Figure 3 also shows the manner in which the knob 40 is aligned with the top of the stem 20 to concentrate pressure at the portion of the diaphragm which engages the stem 20, thereby accommodating actuation of the stem to the open position of Figure 3 by less pressure from the operator's finger 50 (Figure 2) than that heretofore required with or without an actuator cap.

It may be noted that any desired valve mechanism may be used; however, an important aspect of the invention resides in the manner in which the knob 40 is aligned with the stem 20 which cuts off flow of fluid to the nozzle, regardless of the particular valve mechanism in the valve body.

Thus it will be understood that I have devised an aerosol valve actuator cap which is simple and economical in construction; which may be permanently deformed to snugly fit valve bodies of various dimensions; and which slides along the valve body to accommodate deflection of the diaphragm. The novel cap may also be conveniently assembled and disassembled with respect to the valve body by the operator and comprises means for preventing accidental disassembly from the body. The novel cap also comprises means for concentrating pressure from the operator's finger at that portion of the diaphragm which engages the valve stem to open flow of fluid to the nozzle.

What is claimed is:

An actuator of the class described for a valve having a body with a nozzle, a stem having means for cutting off flow of fluid to the nozzle, and a resilient diaphragm covering said stem and sealing the body; said actuator comprising a cap formed of a single segment of metal, said cap having means engaged with the diaphragm at a point in alignment with the stem, and said cap comprising a plurality of spaced legs gripping said body and slidable therealong as said means are urged against the diaphragm for opening the stem, two of said legs straddling the nozzle, said metal being capable of permanent deformation by manual pressure whereby the legs may be manually spread apart or urged together to adjust the position of said legs to any size of valve body, and said metal being resilient whereby the legs in any adjusted position thereof resiliently grip the body therebetween.

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