March 6, 1956 L. J. BEHR ET AL 2,737,416

NONCLOG CAP FOR SPRAY DISPENSERS

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Fig. 1.

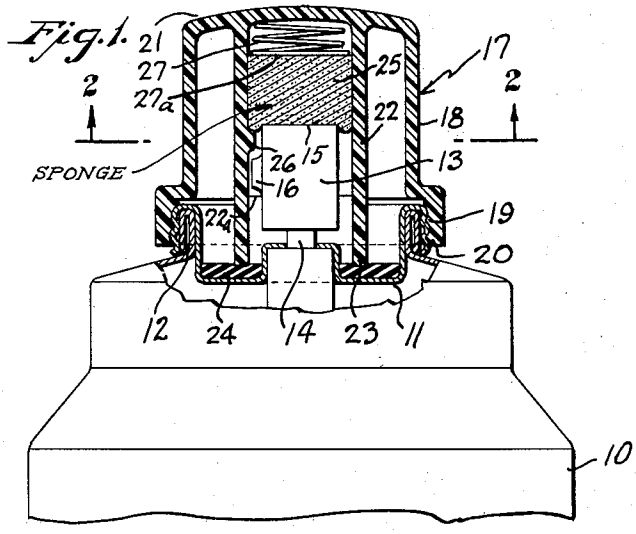


Fig. 2.

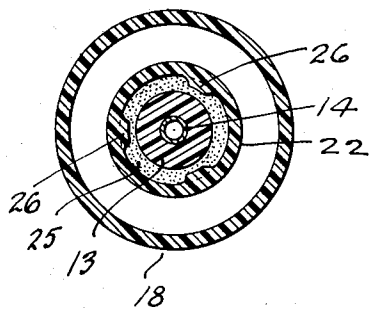


Fig. 3.

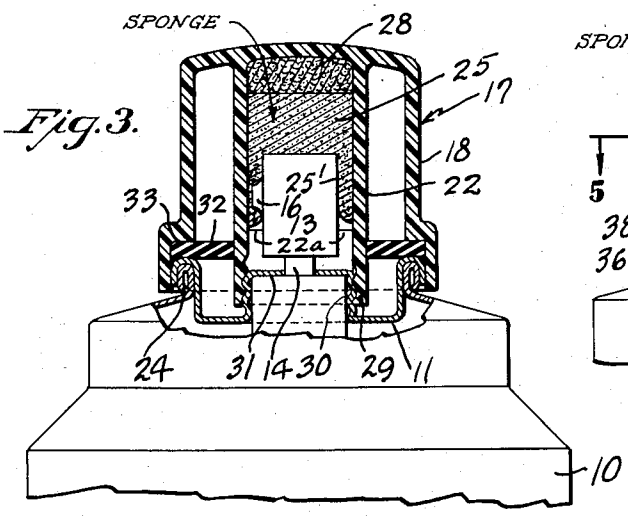


Fig. 4.

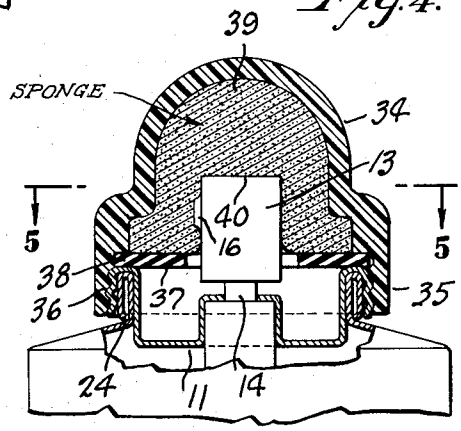
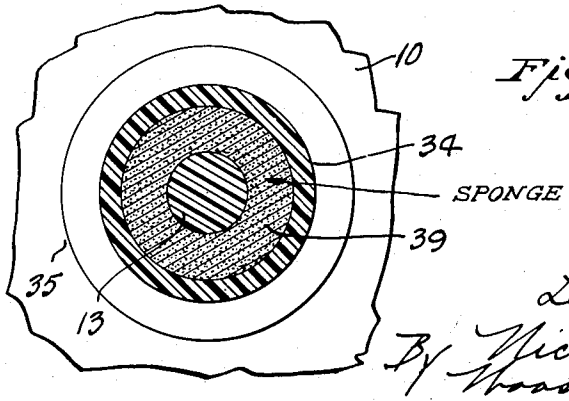


Fig. 5.



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NONCLOG CAP FOR SPRAY DISPENSERS

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7 Claims. (Cl. 299—95)

This invention relates to spray dispensers for various liquid materials, and more particularly to a nonclog cap for such spray dispensers to prevent the discharge orifice of the spray nozzle from becoming filled up or clogged, so that it is always open for instant use when desired.

It is common for the orifice of the spray nozzle of such devices to become clogged and the device rendered useless by the liquid material to be sprayed through the nozzle drying and hardening in the orifice, thus closing or clogging this orifice and preventing use of the device until the orifice is cleared by some means. It is common for directions to be printed on the container directing that such orifices be cleared by a wire or a needle.

It is therefore an object of the present invention to prevent this clogging of the spray discharge orifice and keep it in a clean operative condition, both to keep the device operative at all times and also to prevent damage to the orifice by such operation as the user inserting a wire, needle or pin into the orifice.

It is a further object to provide a closure or cap for the spray nozzles of such devices in which is some means for maintaining the orifice in a moist or nondrying condition to prevent hardening or drying of the spray material in the nozzle and thus prevent clogging of the nozzle, and keeping it free and clear at all times for instant operation when desired.

With the foregoing and other objects in view, we have devised the construction illustrated in the accompanying drawing forming a part of this specification. It is, however, to be understood the invention is not limited to the specific details of construction and arrangement shown, but may embody various changes and modifications within the scope of the invention.

In this drawing:

Fig. 1 is a partial side elevation of a can container and discharge nozzle for a spray liquid and partial section of the upper part of the can and the closure cap involving our invention;

Fig. 2 is a transverse section substantially on line 2—2 of Fig. 1;

Fig. 3 is a view similar to Fig. 1 showing a somewhat modified arrangement of the device;

Fig. 4 is a similar view showing another modified arrangement, and

Fig. 5 is a tranverse section substantially on line 5—5 of Fig. 4.

As above suggested, a great deal of trouble or difficulty is encountered in the operation of so-called spray dispensers for such materials as paint, shellac, varnish, pigments and the like, as well as other and different materials, by their drying and hardening in or on the opening of the discharge or spray nozzle of this dispenser. This of course renders the device inoperative until this opening or orifice is properly cleared. This naturally is annoying, as ordinarily proper implements are not available for proper clearing of the opening, and if this clearing is not carefully and skillfully done the device may be injured by either enlarging the orifice or deforming it.

Paint and similar materials, for example, will congeal and harden when exposed to the air and thus will quickly close or clog the spray orifice, which is usually a relatively small or restricted opening to secure the spray effect.

This device provides means for preventing this material from drying or hardening in the restricted spray orifice, and therefore thus keeps this orifice clear and ready for immediate use.

Referring first to the device shown in Figs. 1 and 2, the spray can or dispenser is shown at **10** comprising a can or container for liquid spray material, and it is closed at the top by any suitable type of closure **11** secured to the top by any suitable means, as the folded-over flange construction **12** and carries the spray nozzle **13** which also may be of any suitable type, a common form comprising a discharge tube **14** communicating with the interior of the container for conducting the liquid to the discharge nozzle and the nozzle member itself **13** may be made of plastic material slipped over the end of the tube **14** and provided with a discharge or spray orifice either in the top **15**, or, in the form shown, in the side nozzle **16**. In this type of device pressure is provided on the material in the container and the spray nozzle is operated by either pressing inwardly or laterally with thumb or finger on the nozzle **13**, which through mechanism (not shown) will provide communication from the interior of the container to the discharge tube **14**, and permit the liquid material in the container to be discharged through the orifice in the nozzle **16** in a fine spray for application to any surface desired.

Our improved device for maintaining the discharge orifice in a clear unclogged condition comprises a closure cap **17** with a side wall **18** having in its lower end, an internal thread **19** whereby the cap may be threaded onto an external thread **20** on the outer side of the overlapped flange **12**. Depending from the top **21** of the cap is an interior tubular wall **22** open at its lower end so that as this cap is applied to the container this wall will pass down over the spray nozzle **13** and enclose it, the lower end **23** of this wall being adapted to press onto a rubber or similar washer or gasket **24** carried in an annular depression in the top **11** of the container and form a liquid-tight seal. In the upper part of the space enclosed by the wall **22** is some means for retaining a proper liquid to prevent drying of the material of the container in the orifice of the nozzle **16**. This is some fibrous liquid absorbent material, preferably a sponge, either natural or artifical, indicated at **25**, and it will absorb and retain a considerable amount of the liquid which will prevent hardening or drying of the liquid of the container in the nozzle orifice. Thus, for example, if the container is for paint and similar material, this sponge or fibrous material would be saturated with a thinner for the paint, such as turpentine or linseed oil, benzene, naphtha, solvent and the like, and these are mentioned merely by way of example, as it will be understood the liquid used in this absorbent material would depend on the type of material used in the spray dispenser. We are not limited to the use of a sponge for retaining this material and applying it to the orifice of the nozzle, as any suitable absorbent material may be used, such, for example, as felt, cotton, wool, or any similar material. This material absorbs and retains the liquid, and by capillary action either feeds it directly to the orifice of the nozzle if it is in contact therewith, or feeds it to the surface of the nozzle which carries it to the orifice by capillary action along this surface if the absorbent material does not actually contact the surface of the orifice. It would also keep the atmosphere in the space surrounding the nozzle saturated with the vapor of this material so the material in the nozzle opening would not dry or harden. Suitable

lugs **26** may be provided on the inner side of the walls **22** to retain this absorbent material in the cap, and resilient means may be provided to tend to press the absorbent material against the nozzle and if desired more or less compress this absorbent material to force the liquid therein to the surface of this material and to the surface of the nozzle. A thin sheet or disc **27***a* of metal, hard rubber and the like may be placed between the spring and the fibrous material to form a backing. The spring may or may not be attached to the top of the cap and the disc. This resilient means, as shown in Fig. 1, comprises a spring **27**, but other resilient means may be used, as for example that shown at **28** in Fig. 3, comprising a felt or similar material, which can also act as an absorbent material and retain more of the liquid. This cap can be made of any suitable material, such, for example, as metal, glass or the like, but it is preferably of a transparent plastic so that the absorbent material can be easily observed, and also so that when supplying it with the liquid the cap can be inverted and the inner compartment filled with this liquid up to the marks **22***a* on the inner surface of the wall **22**.

The device of Fig. 3 is substantially the same as that of Fig. 1, except that instead of having an internal thread at the lower end of the outer wall, **18**, an internal thread **29** is provided at the lower end of the inner wall **22** threaded onto a similar thread **30** on the central portion **31** of the closure **11**. In this case a similar washer **24** could be used as that shown in Fig. 1, but in this particular instance a washer **32** is seated on the top rim of the flange **12** and extends between the outer wall **18** and the inner wall **22**, and it is clamped against the top of the flange **12** by a shoulder **33** on the inner side of the outer wall **18**. Within the wall **22** is the sponge or similar fibrous absorbent material **25** engaging the spray nozzle **13**, except in this case it is shown as extending further down around the sides of the nozzle **13** by providing it with a recess **25'** in its lower end to receive the nozzle. Thus the sponge or absorbent material is carried down over the spray discharge orifice in the nozzle tip **26**, and therefore the material is in direct contact with this orifice. The cap may be of transparent plastic or other suitable material.

In the form of the device shown in Fig. 4, the cap **34** is of somewhat different shape, it being more or less semispherical or dome-shaped, with a circular flange **35** at its lower end internally threaded as shown at **36** for threading onto the externally threaded portion of the flange **12**. It may be sealed by a sealing washer **37** similar to the washer **32** of Fig. 3 resting on top of this flange and clamped against it by the internal shoulder **38** on the cap. In this form of the device the internal wall **22** of the first two caps is omitted and the sponge or similar fibrous absorbent material **39** fills substantially the whole interior of the cap. It may be somewhat bell shaped, or that is, provided with a recess **40** in its lower portion of a size to receive the nozzle **13** and enclose this nozzle similar to the arrangement of Fig. 3 and therefore to bring this absorbent material and the liquid held thereby directly to the discharge orifice or the surface of the nipple **16**, the same as in Fig. 3. This cap can also be made of transparent material or other material the same as the first forms.

It is preferred to use the screw connection for all forms, but in each case the cap could be telescoped on the flange **12** with a tight fit, and omitting the screw threads.

It will be understood from the above the device supplies a suitable liquid at all times to the discharge opening of the spray nozzle and this prevents the material from a previous spraying operation from drying or hardening in or otherwise clogging this opening, so it is free and clear at all times, and as soon as the cap is removed from the container the spray may be used immediately. The device therefore is always in condition for instant use, no clearing of the spray opening is necessary, doing away with the necessity of finding some implement for such an operation, and preventing injury to the opening, and as the opening is free and clear the spray device always operates properly and at greatest efficiency.

Having thus set forth the nature of our invention, we claim:

1. In a spray dispenser including a container forming means for holding liquid spray material under pressure and a nozzle connected therewith provided with an orifice forming a means for discharge of the material by said pressure in the form of a spray, a closure cap for the nozzle, means detachably connecting the cap to the container in position to enclose the nozzle, and absorbent means in the cap adjacent the orifice containing a liquid capable of preventing hardening of the spray material in the orifice to clog this orifice.

2. In a spray dispenser including a container forming means for holding liquid spray material under pressure and a nozzle connected therewith provided with an orifice forming a means for discharge of the material by said pressure in the form of a spray, an enclosing means for the nozzle secured to the container, and a liquid absorbent means in the enclosing means adjacent the nozzle to supply a liquid to the orifice and prevent hardening of the spray material in the orifice to clog it.

3. In a liquid dispenser including a container forming means for holding liquid spray material under pressure and a spray nozzle connected therewith provided with a restricted discharge opening forming a means for dispensing the liquid from the container by said pressure in the form of a spray, means secured to the container comprising a compartment enclosing the nozzle, a liquid absorbent means in the compartment adjacent the nozzle opening to supply a liquid to said opening and prevent hardening of the spray material in the opening to clog it, and a liquid tight seal for the compartment.

4. In a liquid dispenser including a container forming means for holding liquid spray material under pressure and a spray nozzle connected therewith provided with a restricted discharge opening forming a means for dispensing the liquid from the container by said pressure in the form of a spray, a closure cap provided with a compartment enclosing the nozzle, a fibrous liquid absorbent material in the compartment adjacent the nozzle opening to supply a liquid to said opening and prevent hardening of the spray material in the opening to clog it, means securing the cap to the container, and a liquid tight seal for the compartment to maintain the absorbent material in a moist condition.

5. In a liquid dispenser including a container forming means for holding liquid spray material under pressure and a spray nozzle connected therewith provided with a restricted discharge opening forming a means for dispensing the liquid from the container by said pressure in the form of a spray, a closure cap for the nozzle comprising a compartment to receive the nozzle, a sponge-like member in the compartment to receive and retain a liquid, said member being provided with a recess to receive and enclose at least a part of the nozzle to supply said liquid to the discharge opening to prevent hardening of the spray material in said opening to clog it, and means to secure the cap to the container.

6. In a liquid dispenser including a container forming means for holding liquid spray material under pressure and a spray nozzle connected therewith provided with a restricted discharge opening forming a means for dispensing the liquid from the container by said pressure in the form of a spray, a closure cap provided with a compartment enclosing the nozzle, a fibrous liquid absorbent material in the compartment adjacent the nozzle opening to supply a liquid to said opening and prevent hardening of the spray material in the opening to clog it, a resilient means in the compartment between the absorbent means

and the cap tending to press the absorbent material against the nozzle, and means for securing the cap to the container.

7. In a liquid dispenser including a container forming means for holding liquid spray material under pressure and a a spray nozzle connected therewith provided with a restricted discharge opening forming a means for dispensing the liquid from the container by said pressure in the form of a spray, a closure cap for the nozzle comprising an outer enclosing wall provided with a closed outer end wall and an inner wall depending from the closed wall providing a compartment open at its inner end to receive the nozzle, a fibrous liquid absorbent means in the compartment adjacent the nozzle discharge opening to supply liquid to this opening and prevent hardening of the spray material in the opening to clog it, means for securing the cap to the container, and a liquid seal for said compartment.

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