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(54) **CONE-SHAPED AEROSOL CAN SPRAY NOZZLE**

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(57) **ABSTRACT**

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Related U.S. Application Data

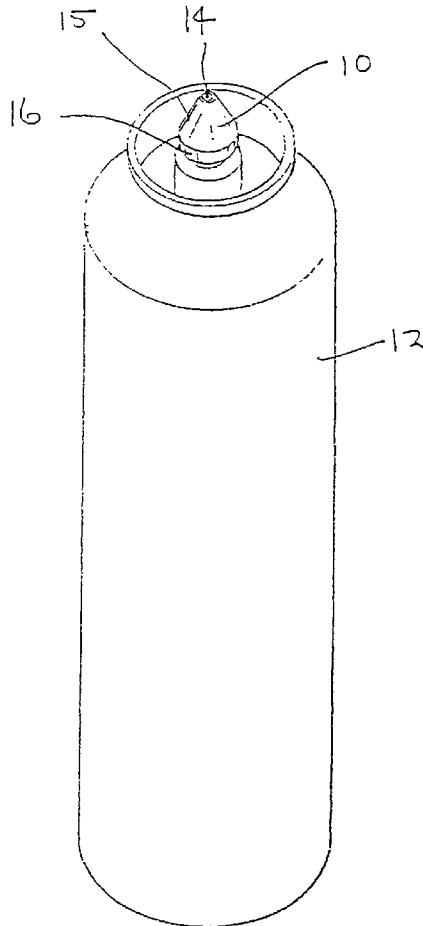
(63) **Continuation-in-part of application No. 09/906,584, filed on Jul. 13, 2001, now Pat. No. 6,478,198.**

(60) **Provisional application No. 60/218,645, filed on Jul. 14, 2000.**

Publication Classification

(51) **Int. Cl.⁷ B65D 83/00**

A cone-shaped nozzle for an aerosol spray can is disclosed. The nozzle preferably has a tip with a top end, and an opposing bottom end that connects to a stem in the release valve on the top of the can. Through the nozzle from the top center of the tip to its bottom center is a central cylindrical passageway. The top end of the passageway is the tip orifice, through which is discharged the contents of the can, and the bottom end of the passageway is an orifice, which orifice receives the stem and the contents of the can for passage to the tip. The bottom orifice cooperates with the top of a stem of the release valve in the top of the can, so that the nozzle is supplied through the stem into the orifice. The bottom orifice permits the cone-shaped nozzle to be depressed on its top, and travel downwardly far enough to activate the release valve. Optionally, there is an opening in the wall of the nozzle to permit the ingress of aspirating air into the central cylindrical passageway when the release valve is activated.



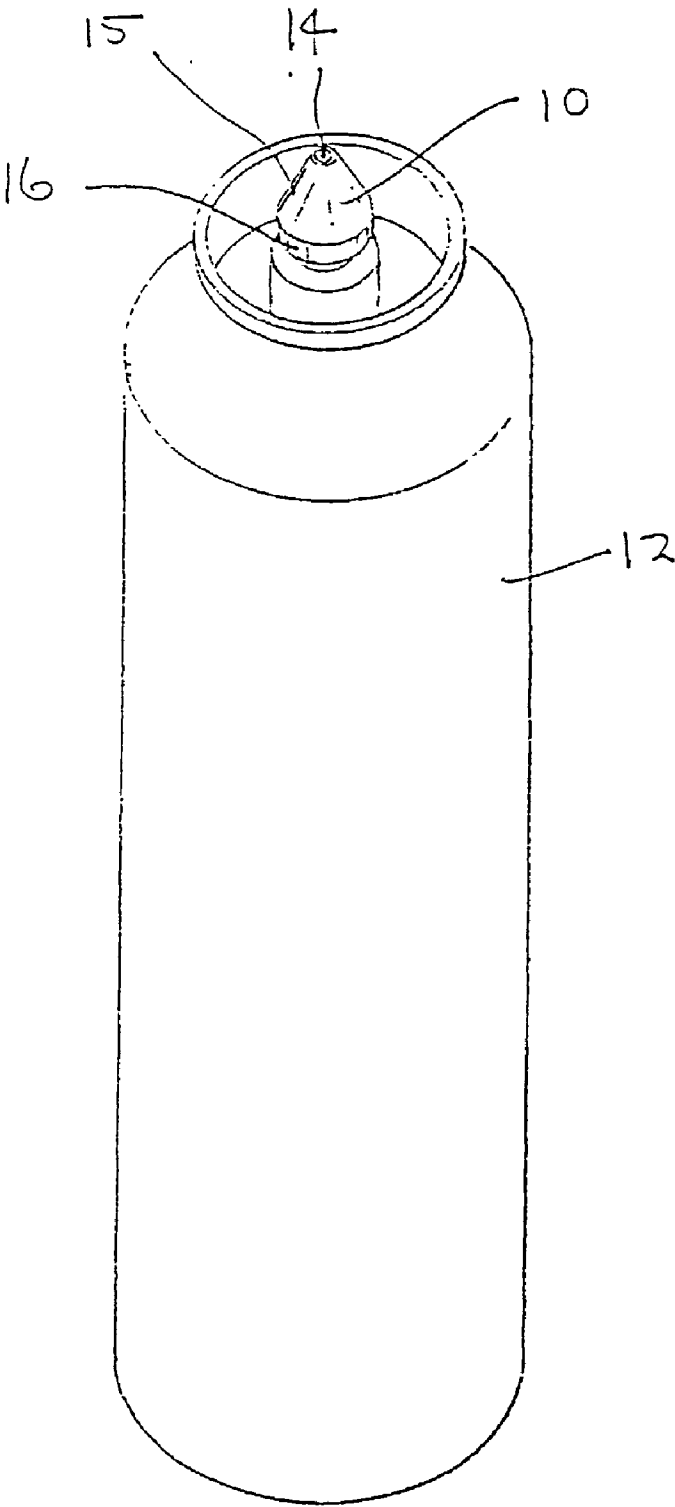


FIG. 1

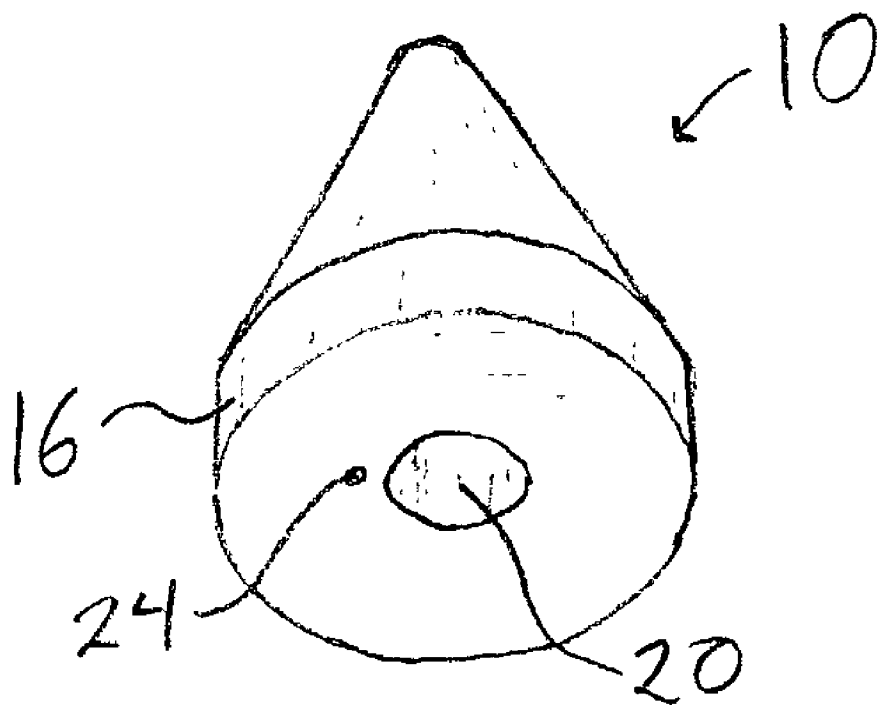


FIG. 2

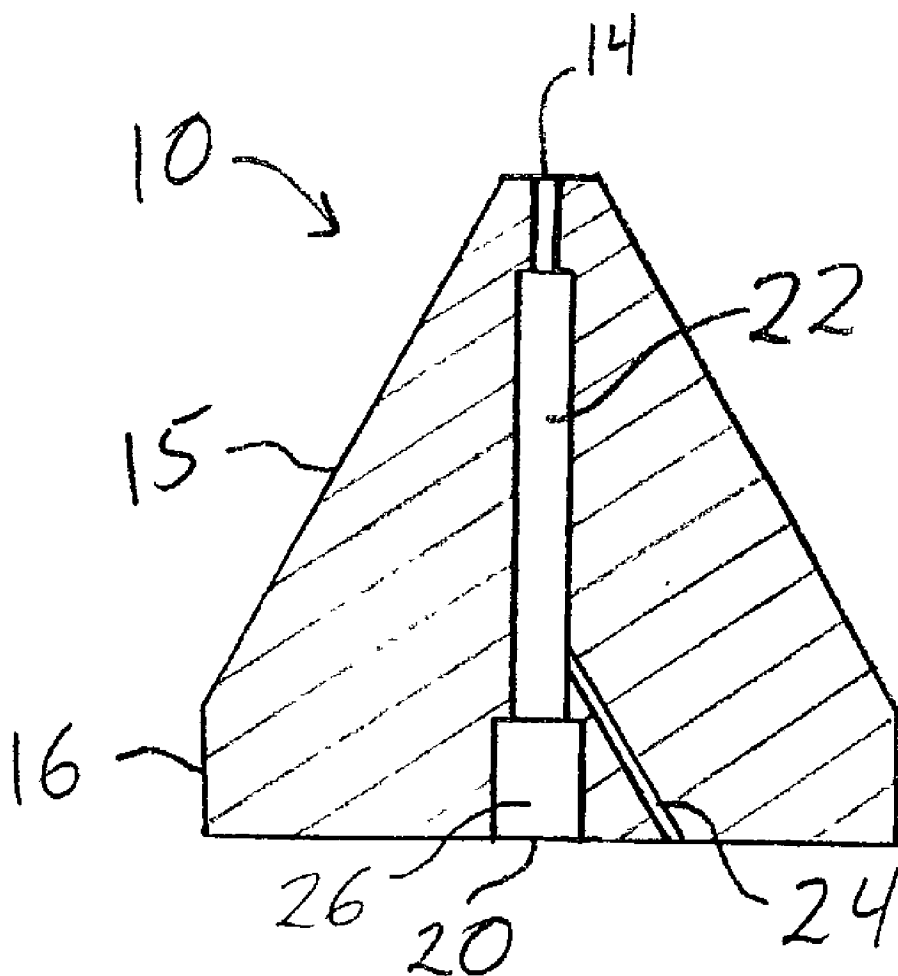


FIG. 3

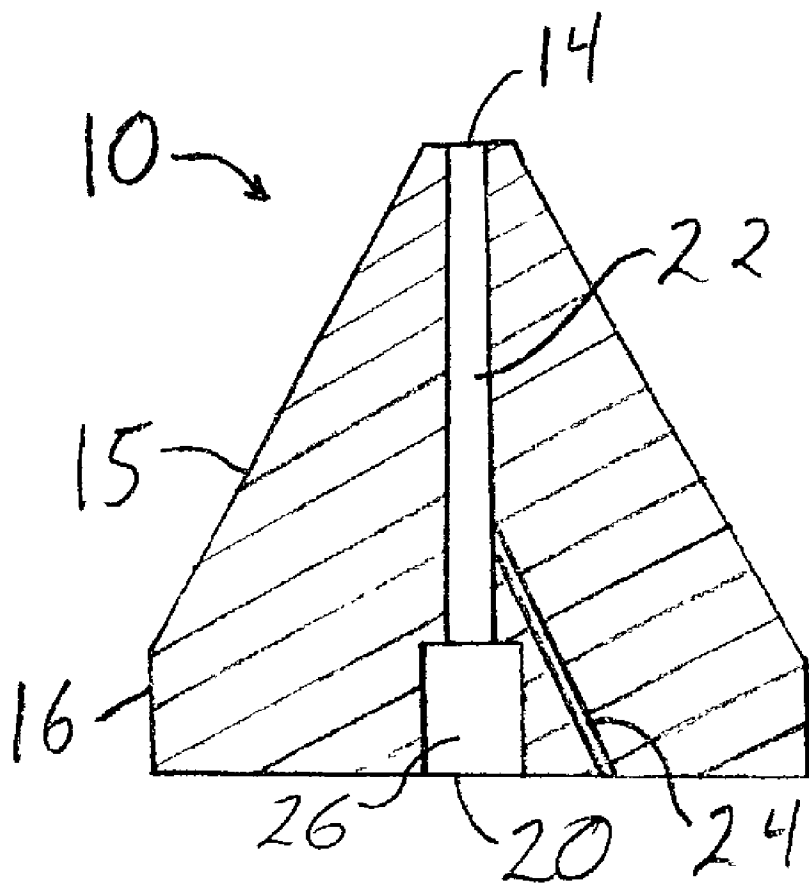


FIG. 4

CONE-SHAPED AEROSOL CAN SPRAY NOZZLE

BACKGROUND OF THE INVENTION

[0001] This application is a continuation in part application of, and claims priority from, U.S. patent application Ser. No. 09/906,584, filed on Jul. 13, 2001, entitled "Cone-Shaped Aerosol Can Spray Nozzle", now U.S. Pat. No. 6,478,198, which claims priority of Provisional Application Serial No. 60/218,645, filed on Jul. 14, 2000, the disclosure of which applications is incorporated herein by this reference.

DESCRIPTION

[0002] 1. Field of the Invention

[0003] This invention relates generally to aerosol spray cans, and more specifically to a cone-shaped nozzle for an aerosol spray can.

[0004] 2. Related Art

[0005] Knight (U.S. Pat. No. 4,239,407), issued Dec. 16, 1980, describes an aerosol spray can with several nozzles for application of the spray can contents into hard-to-reach places. This patent discloses a cone-shaped nozzle which discharges through orifices in its outer conical surface, but not through its tip. The release valve in this patent is activated by a push-button in the side of the can.

[0006] Still, there is a need for a simple and economical aerosol can spray nozzle which can also activate the release valve. This invention addresses this need.

SUMMARY OF THE INVENTION

[0007] This invention is a cone-shaped nozzle for an aerosol spray can. The nozzle discharges through an orifice in the tip of the cone. The tip orifice is the top of a cylindrical passageway near the center of the top of the cone. The central cylindrical passageway extends through the center of the cone. Preferably, at or near the bottom of the cone is a cylindrical stem sleeve, through which the central cylindrical passageway also extends.

[0008] The nozzle is supplied through an orifice in the bottom of the central cylindrical passageway. Preferably, the bottom of the cylindrical passageway has a wider stem sleeve that cooperates with the top of a stemmed release valve in the top of the aerosol can. The stem sleeve is long enough to permit the cone-shaped nozzle to be depressed on its top, and travel downwardly far enough to activate the release valve. Optionally, there is an opening in the wall of the nozzle to permit the ingress of aspirating air into the central cylindrical passageway when the release valve is activated.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a top side perspective view of one embodiment of the invention mounted on the top of an aerosol can.

[0010] FIG. 2 is a bottom side perspective view of the embodiment of the invention depicted in FIG. 1, but without the spray can.

[0011] FIG. 3 is a side, cross-sectional view of the embodiment of the invention depicted in FIGS. 1 and 2.

[0012] FIG. 4 is a side, cross-sectional view of another embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] Referring to the Figures, there is depicted one, but not all, of the embodiments of the invention. Conical nozzle 10 is mounted on the top of aerosol spray can 12. Nozzle 10 has a tip orifice 14 in its tip, a conical section 15 and a cylindrical base 16. Can 12 has a release valve (not shown) in its top. Typically, the release valve is centrally located and activated by downward pressure on its top.

[0014] The top of the release valve attaches to a cylindrical stem (not shown) that cooperates with stem sleeve 26 through orifice 20 in the bottom of cylindrical base 16 of nozzle 10. The stem preferably fits into stem sleeve 26, but is too large to fit into cylindrical passageway 22. Orifice 20 is the bottom of a cylindrical passageway 22, which extends from the bottom to the top of nozzle 10. The top of central cylindrical passageway 22 is tip orifice 14. Preferably, nozzle 10 has an opening 24 in its base that permits the ingress of aspirating air into cylindrical passage 22 when the release valve is activated.

[0015] Conical nozzle 10 may be any convenient size. Smaller, finer nozzles 10 will be more appropriate for supplying the aerosol can contents to smaller spaces, and vice-versa. Preferably, nozzle 10 is cone-shaped, but other, tapering shapes will also do. For example, instead of rounded sides, nozzle 10 may also have squared-off, but tapering sides, as long as the top of the nozzle terminates in a fine or pointed tip. Cylindrical base 16 is optional, but when it is present, it may be rounded or squared-off also.

[0016] Nozzle 10 may be made of any suitable material, including metal or plastic, and may be made by any conventional technique, including machining, forging, stamping, or molding.

[0017] Aerosol spray can 12 may be any conventional spray can with a gas propellant and liquid contents for dispensing. Preferably, spray can 12 has a release valve in its top which is activated by downward pressure on nozzle 10. When the release valve is activated, propellant gas and liquid contents of the spray can are released.

[0018] Preferably, spray can 12 is an aerosol can containing a light, low viscosity lubricant and a light propellant gas, like hexane, for example. This way, spray can 12 and nozzle 10 may be used to effectively dispense the lubricant to a specific, small area. For example, nozzle 10 may conveniently be inserted into the small lubricant hole opening in the nose of a chain saw sprocket. This way, when nozzle 10 is depressed, the release valve is activated, and the pressurized contents of the spray can 12, namely lubricant and hexane, are discharged from the top of the release valve. This way, the new lubricant sprayed into the hole can clean out the old lubricant and other debris on the surface to be lubricated, blasting it away. Then, the excess hexane propellant will evaporate quickly, leaving a cleaner and freshly-lubricated surface. Therefore, this apparatus and technique have advantages over the prior art pumping liquid-lubricant-only technique.

[0019] A friction fit is preferably established between the top of the release valve stem and the stem sleeve 26. This

way, the discharged contents exiting through the valve are directed through stem orifice **20** into central cylindrical passageway **22**, up through the center of nozzle **10**, and out tip orifice **14**. Preferably, additional aspiration air is admitted into passageway **22** through opening **24** in the side wall of nozzle **10**. This way, a more turbulent mixing of the can **12** discharged contents is effected, for ultimately better distribution of the lubricant.

[0020] The preferred friction fit between the top of stem and the stem sleeve **26** also permits convenient change-out of the nozzle **10** to prevent accidental discharge of the can's contents, or to permit the installation instead of a different size or type nozzle, for example.

[0021] Tip orifice **14** may be any effective size of shape. Preferably, tip orifice **14** is a flat circle. However, a slanted oval, or a slot, or a plurality or combination of any of these orifices may be used. Tip orifice **14** may be the same diameter as central cylindrical passageway **22**, or of different diameter. Additional aspirators and/or diffusers may be included in orifice tip **14**.

[0022] Conical section **15** may have any effective angle of taper. Shorter, blunter conical sections **15** may be more appropriate for tighter spaces, while longer, sharper conical sections may be more appropriate when there is more room for the user to work in.

[0023] The release valve stem has an outer diameter slightly smaller than stem sleeve **26**. Stem sleeve **26** must be long enough to allow the stem to enter and create a preferred friction fit, yet be shallow enough to allow depression of stem to trigger the release valve. Therefore, the difference between the lengths of the stem and stem sleeve **26** must be at least as long as the downward travel or movement during activation of the valve.

[0024] Stem orifice **20** is the bottom of cylindrical passageway **22**, and orifice **20** and stem sleeve **26** are preferably

larger in diameter than passageway **22**. Passageway **22** is preferably smaller than the stem to prevent ingress of the stem into passageway **22** in order to insure function of the release valve when nozzle **10** is depressed.

[0025] Opening **24** in the side wall of nozzle **10** is for allowing aspirating air to enter central cylindrical passageway **22** when the release valve is activated. Therefore, opening **24** preferably exists on a location on the side wall of passageway **22** where air can flow into passageway **22** when the release valve is activated, preferably at least a distance up from the bottom of passageway **22** greater than the length of the stem.

[0026] Although this invention has been described above with reference to particular means, materials, and embodiments, it is to be understood that the invention is not limited to these disclosed particulars, but extends instead to all equivalents within the scope of the following claims.

I claim:

1. A aerosol can spray nozzle for cooperating with a release valve in the top of an aerosol can comprising:

a cone-shaped tip with a top and a bottom;

an orifice near the center of the top of the tip;

an orifice near center of the bottom of the tip; and

a central passageway extending through the center of the tip, from the orifice near the center of the top, to the orifice near the bottom of the nozzle;

wherein said orifice near the bottom of the tip is adapted to receive a stem of the release valve in the top of the can.

2. The nozzle of claim 1 wherein there is an opening in the wall of the nozzle to permit the ingress of aspirating air into the central passageway when the release valve is actuated.

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