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AEROSOL SPRAY NOZZLE, VALVE AND CAN TOP CONSTRUCTION

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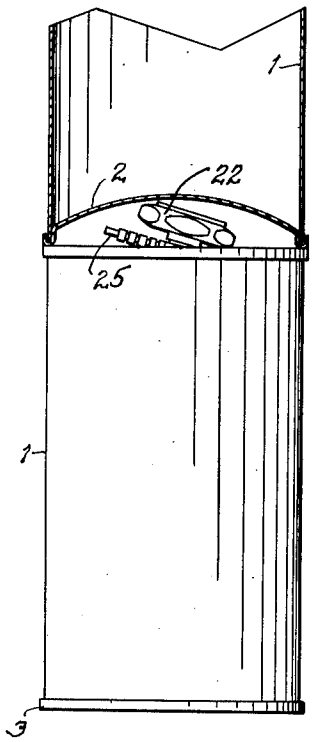

FIG. 1

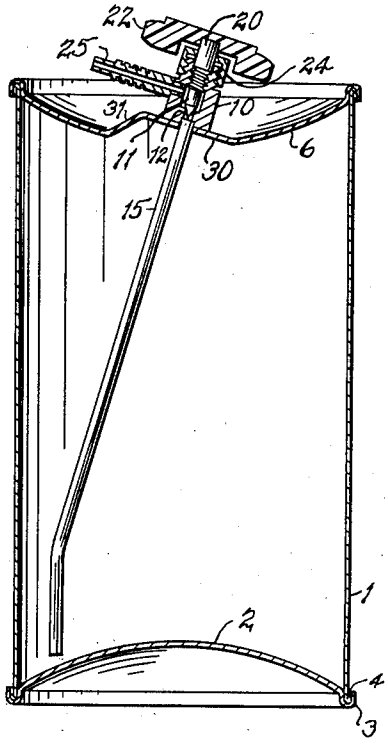

FIG. 2

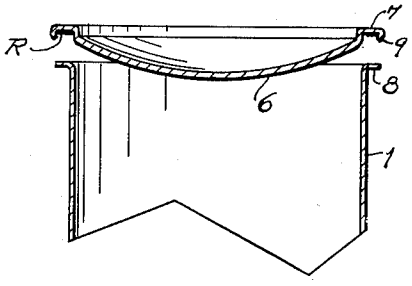

FIG. 3

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AEROSOL SPRAY NOZZLE, VALVE, AND CAN TOP CONSTRUCTION

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1

This invention relates to aerosol cans for the spraying of various liquids, and particularly those where it is satisfactory to use a feed tube leading from the bottom of the can to a valve located at the top and outside of the can, and where the can is provided with concave or inwardly arched cans.

A form of aerosol can widely used comprises a cylindrical can closed at its ends with inwardly crowned disk members joined by rolled flanges at their perimeter with the wall of the can. In attaching a valve and nozzle to such a can top, provision needs to be made to avoid having the nozzle direct the stream or spray against the adjacent edge of the can. If the valve and nozzle construction is made of sufficient height to have the valve body fitted to and carried by the inner portion of the concave arch of the can top, it results in projecting the valve structure and operating handle a greater distance than is desired, and which, incidentally, precludes stacking of the cans, and adds to the cost of the valve.

An object of the present invention is to utilize a simple can construction with the concave top, and so position the valve and feed or siphon tube that the valve body and handle will not project objectionably above the top edge of the can, and yet the valve nozzle will direct its stream or spray well above the edge of the can.

An important and desirable characteristic of such cans is to permit them to be stacked for display or storage, and where both ends are concave my valve construction does not interfere with such stacking but rather facilitates same.

Other objects are the attainment of simplicity and cheapness of construction and convenience in operation.

A preferred embodiment of my invention appears in the accompanying drawings, in which:

Fig. 1 is a side elevation of a can having a valve and top construction according to my invention, and showing a fragmentary section of a can "stacked" upon it;

Fig. 2 is a vertical central section through a can showing the valve and top construction on a slightly enlarged scale; and

Fig. 3 is a sectional detail showing a can cover before being secured to the side wall portion.

It should be noted that in the normal construction of such cans and in the mounting of a valve and feed or siphon tube, economy and convenience of assembly operations require the mounting of the valve approximately centrally of the can top, and also so constructing it that its body and nozzle may rise from the depression of the concave top well above the perimeter and edge

2

of the can. To use the preferred and economical short valve body and small one-piece nozzle and effectively mount it with a minimum of expense was found to involve problems, the solutions for which were by no means obvious, as will appear in the following description which relates to the accompanying drawings, in which, 1 indicates the cylindrical side wall of a standard form of pressure-retaining tin can. The bottom 2 is a circular disk arched upwardly and inwardly, and having its perimeter flanged or beaded as at 3, extending outwardly and over the beaded portion 4 of the edge of the wall 1, and soldered or similarly secured as is customary.

A preferred simple and very cheap and convenient to use form of valve comprises a short cylindrical body 10 having a threaded needle valve 11 closing a restricted portion 12 of a passage with which communicates a siphon or feed tube 15. The needle valve proper is indicated at 20 and is shown as threaded to the valve body and as provided with a tapered point projecting into the passage 12, and as having a suitable handle 22 rigidly fixed at its upper end. A packing gland may be formed with suitable packing under a threaded cap 24. From the interior of the valve body the liquid may pass out through a nozzle member 25 rigidly fixed in the body, as shown.

It will be seen that the height of the valve body and handle is such that if it were mounted centrally and vertically of the can, the nozzle 25 would direct its stream against the can top below the upper edge thereof.

A solution to this difficulty, while not sacrificing other desirable characteristics, has been found in the following arrangement:

The can top 6, which is arched inwardly and has its flange 7 secured to the side wall, may be reformed at the central zone to present an upwardly sloping flat portion 30 formed by depressing a portion of the can top having a more abruptly sloping connection 31 at one side of this flattened and tilted zone 30.

This reforming of the flat zone for mounting of the valve body may be accomplished either before or after the can top 6 is secured in position.

In one instance, the preformed arched can top 6, as shown in Fig. 3, is in position to be set upon the outwardly turned flange 8 of the side wall 1 of the can, and as having a flat flange portion 7 and a downwardly turned edge 9 adapted to extend over the perimeter of the flange. The inner side of the flat flange portion 7 may be coated

with a thin gasket at R forming an effective seal. When in position the turning of the bead is completed to form the structure shown in Fig. 2, and, as stated, the can is sealed as by soldering.

Assuming that this or a like customary procedure has been followed and the can top has been assembled to the side wall while the bottom of the can is open, a pair of suitable dies may be brought together on the dome-shaped portion. In this case the edge of the base and the side wall 1 furnish helpful guides in locating the dies for the forming of the angular portion **30** and the incidental offset **31**.

Either before or after this deformation of the arch to form the angle base **30**, an opening is made for the connection for the tube **15** with the valve passage. The valve may now be set in position and soldered or otherwise secured in the assembled position shown in Fig. 2.

When a similar can with its inwardly arched bottom is set upon the edge of the top of the can, the handle **22** and nozzle **25** will clear the same, thus permitting convenient stacking.

In operation, the handle is fully as conveniently operated as though the valve body were upright, if not more so, and the direction of the nozzle is such that the spray therefrom will clear the upper edge and flange of the concave can top.

As heretofore stated, this type of aerosol can with a feed tube leading to the valve from near the bottom of the can has been found very satisfactory usually for liquids which do not have too much tendency to harden in the can. For example, pest and insect sprays, lacquers, and the like, may be used with this form of aersol can, and a convenient mixture for commercial use includes a gas liquid of two forms of Freon, namely, Freon 11 and Freon 12, for example, sixty per cent of the first and forty per cent of the latter, creating a satisfactory pressure permissible for use in this type of can.

Having thus described my invention, what I claim is:

1. An aerosol can construction including a valve and nozzle unit comprising a can having cylindrical side walls and end walls arched and curving inwardly, a valve having a body, a valve stem and handle therefor and of an overall height not greater than the sum of the depths of both arched end walls, the top end wall having a central opening and a surrounding area distorted from the arch at an angle to the axis of the can, the valve having a body and a central passage registering with said opening, and having a surface fitting said angle surface and having a nozzle at right angles to the axis of the valve, and whereby when the valve body is secured in position the nozzle is tilted to point upwardly at an angle over the top edge of the can.

2. An aerosol can construction including a valve and nozzle unit, said can having its end walls arched and curving inwardly, the valve having a relatively short body and a flat disk-shaped operating handle member mounted closely adjacent to the valve body and so connected to the valve as to turn in a plane at right angles to the axis of the valve body, one of the end walls of the can having a flat surface in the central portion thereof against which the inner end of the valve body may be fitted and secured, said flat portion being so positioned as to support the valve body at an angle with relation to the axis of the can, a nozzle rigid with the intermediate portion of the valve body and projecting outwardly and upwardly in a direction past the edge of the can, the height of the valve body and handle being such that the curved arched bottom of another can resting on the top edge of the valve-carrying end of the can may clear the handle and nozzle of the valve unit.

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