Oct. 22, 1946. H. O. SCHROEDER ET AL 2,409,987

MICROSPRAY DEVICE

Filed July 12, 1944

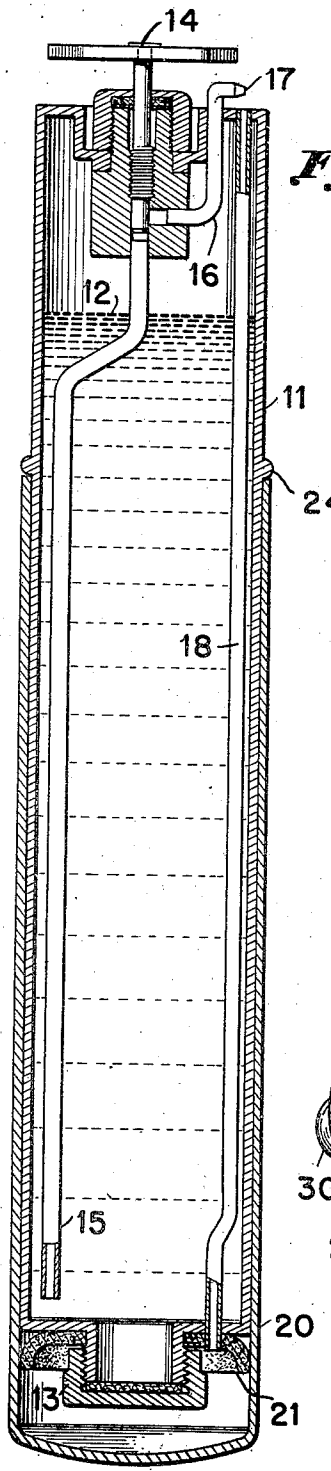


Fig. 2.

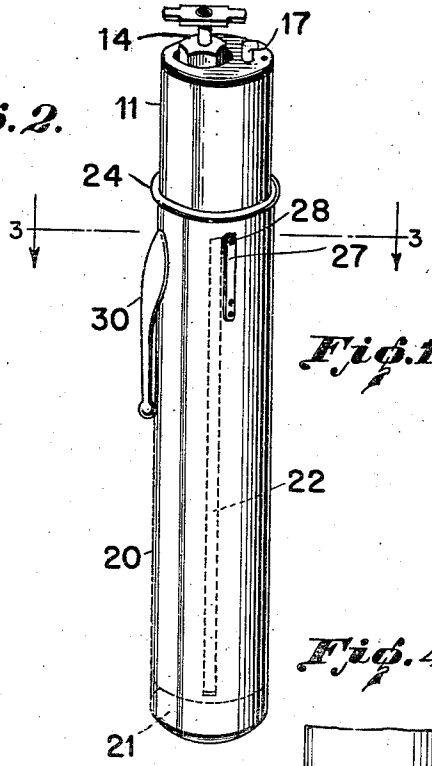


Fig. 1.

Fig. 4.

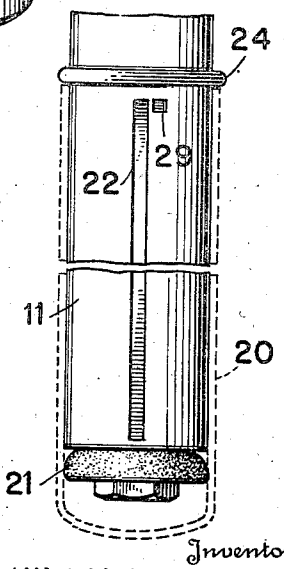
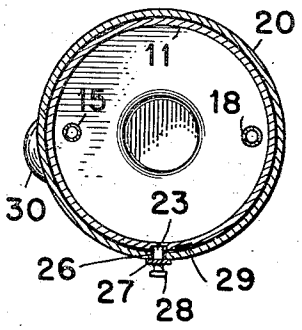


Fig. 3.



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Patented Oct. 22, 1946 2,409,987

UNITED STATES PATENT OFFICE

2,409,987

MICROSPRAY DEVICE

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Application July 12, 1944, Serial No. 544,619

1 Claim. (Cl. 299—88)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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This application is made under the act of March 3, 1883, as amended by the act of April 30, 1928, and the invention herein described, if patented, may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment to us of any royalty thereon.

The present invention relates to the dispersal of liquids into the air and may be used for the purpose of producing either wet sprays, colloidal suspension or aerosols, or semi-colloidal suspensions.

One of the objects of this invention is the provision of a device which can be carried about on the person and transported with a minimum of shipping space and weight for use by troops who must be provided with insecticidal means in various parts of the world in the present global war.

At the present time the shipment of supplies to troops in many parts of the world can only be accomplished by air transportation and the factors of space and weight are very critical in determining whether it is feasible to ship certain items. If the space and weight of the item are too large, it becomes too difficult and impracticable to deliver sufficient quantities by air transportation. Furthermore, the soldier who must carry the item into battle areas must not be overburdened with it. To this end the present invention comprises a device which is so simple and compact that it occupies a minimum of space, not much larger than an ordinary fountain pen and, as a matter of fact, can be secured in the pockets of wearing apparel like a fountain pen.

In the accompanying drawing there is illustrated an embodiment of this invention in which:

Figure 1 is a full size three dimensional view;

Figure 2 is an enlarged elevational section of Figure 1;

Figure 3 is a section along the line 3—3 of Figure 1; and

Figure 4 is a fragmentary elevational view of the lower end of the barrel.

Referring with more particularity to the drawing, the embodiment illustrated comprises a cylindrical barrel 11 for holding a liquid 12 to be dispersed. Although the device is particularly adapted for insecticide dispersal, it is obvious that other materials may also be dispersed with it, such as perfumes, plant growth substances, deodorants, and so forth.

One end of the barrel 11 is provided with a filling cap 13 and the other end with a valve 14, which is connected to a dip tube 15 inside. A delivery tube 16 extends from the valve to the

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exterior of the barrel, where it terminates as a capillary tube 17, the size depending upon the type of dispersion desired. The smaller the diameter of the capillary tube 17, the smaller will be the particles dispersed. A capillary tube having a size of about 0.01 of an inch in diameter will result in the production of a very finely divided spray of the order of aerosols. An air tube 18 extends from a point just below the end of the capillary tube 17 through the interior of the barrel 11 and out through the bottom of the barrel.

The exterior lateral surface of the barrel is smooth and a cylindrical shell 20 is slidably carried on it a few inches below the top. The bottom of the shell 20 is closed and a washer 21 of leather or other suitable material is disposed on the bottom of the barrel to provide an air valve between the shell and the barrel on the principle of an ordinary air pump. The air tube 18 extends through the washer 21 as shown. In operation, the shell 20 is reciprocated on the barrel forcing a stream of air through the tube 18. The shell is made to fit on the barrel body somewhat loosely in order for the pump to breathe air between them. The leather valve is held in position by the filling cap 13 as shown.

The shell 20 is held on the barrel by means of a longitudinal groove 22 on the surface of the barrel 11 engaging a small projection 23 secured to a spring clip 27 on the outside of the shell 20, said projection operating through an aperture 26 in the shell. The groove 22 extends from a point just above the bottom of the barrel 11 to a point at the uppermost position of the projection 23. The uppermost position of the shell 20 is determined by a flange 24 around the body of the barrel which acts as an abutment.

In order to remove the shell from the barrel for the purpose of refilling the barrel or for any other purpose, the projection 23 can be moved outward and retracted from the groove 22 against the spring action of the clip 27. A small knob 28, or other suitable means, is secured to the clip 27 for the purpose of facilitating this retraction. When the projection 23 is retracted in this way, the shell may be easily removed from and replaced on the barrel. On the other hand, when the projection is in normal position, the shell cannot be removed from the barrel.

A small indentation 29 on one side of the groove 22, about the size of the projection 23, may be provided to engage the projection when the device is not in use and thereby prevent the shell 20 from sliding down.

A pocket clip **30** may be attached to the shell **20**, as shown in the drawing.

To operate the device, the valve **14** is opened and the shell **20** reciprocated on the barrel causing an intermittent stream of air to pass through the tube **18** and across the end of the capillary tube **17**, thereby drawing liquid from the barrel and breaking it into finely divided particles, the dimensions of which, as previously mentioned, depending on the diameter of the capillary tube.

Having thus described our invention, we claim:

A device of the character described comprising a cylindrical container, said container having an aperture at one end for introducing a liquid therein to be dispersed, an air pump valve about said aperture, a cap for closing said aperture and holding said valve in position, a shell reciprocally mounted on said container over said valve to pump air, an air conduit having one end in said shell and the other end on the exterior of the container, and tubular means between said exterior end and the inside of the container.

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