

May 9, 1944.

W. H. ROSE

2,348,419

SPRAYING DEVICE

Filed Feb. 28, 1941

2 Sheets-Sheet 1

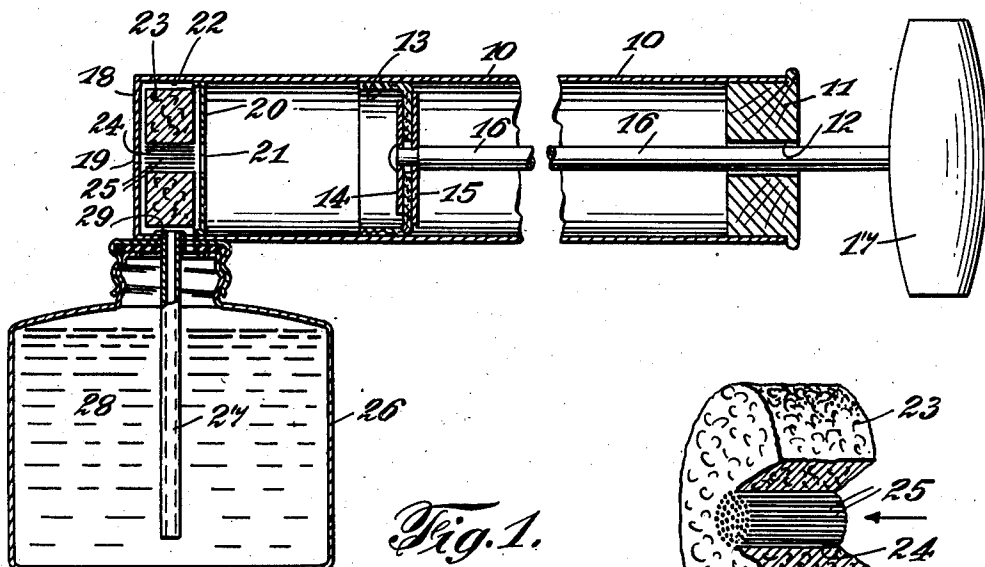


Fig. 1.

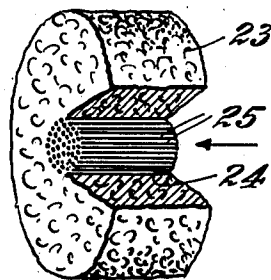


Fig. 2.

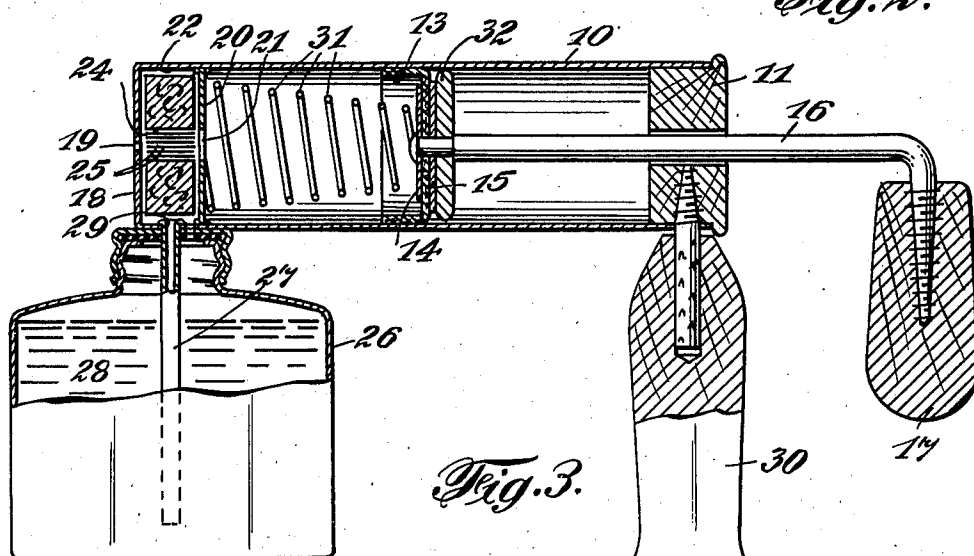


Fig. 3.

INVENTOR.

William N. Rose

BY

Forrest J. Bennett
his ATTORNEY

his ATTORNEY

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2 Sheets-Sheet 2

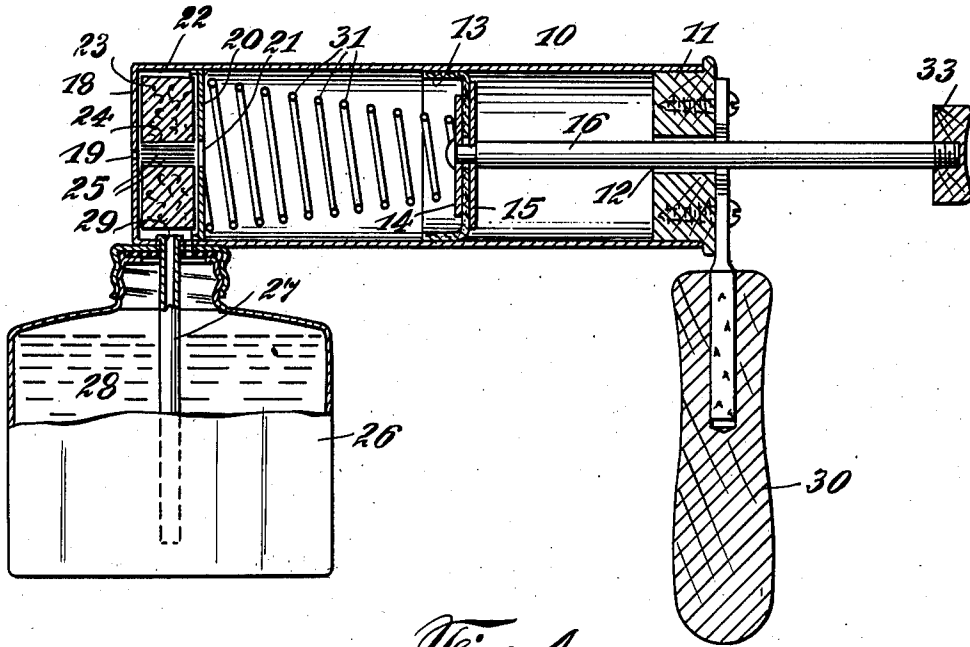


Fig. 4.

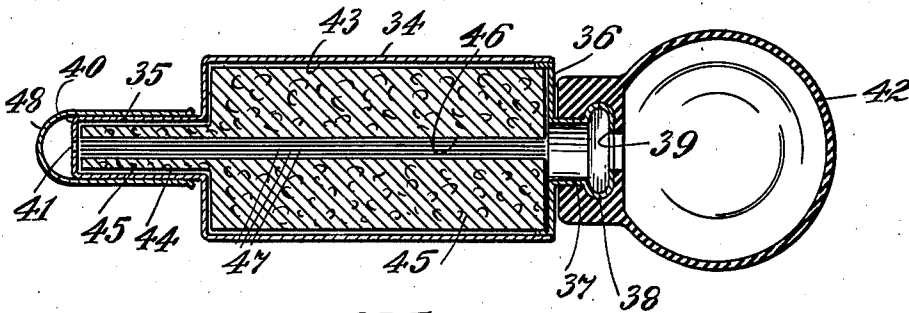


Fig. 5.



Fig. 6.

INVENTOR.
William H. Rose
 BY *Harold L. Loomis*
 ATTORNEY

UNITED STATES PATENT OFFICE

2,348,419

SPRAYING DEVICE

William H. Rose, Jersey City, N. J.

Application February 28, 1941, Serial No. 381,106

5 Claims. (Cl. 299—88)

My invention relates to spraying devices and refers particularly to liquid spraying devices.

One of the objects of my invention is a spraying device of convenient operation and positive action.

Another object of my invention is a spraying device having a minimum of moving parts.

Another object of my invention is a spraying device in which a supply of liquid is maintained within the device itself.

Another object of my invention is a spraying device whereby a liquid will be broken up into a plurality of parallel streams prior to its emission from the device.

Another object of my invention is a spraying device in which a plurality of parallel streams of a liquid is forced directly at the exit opening of the device.

Another object of my invention is a spraying device in which a plurality of parallel streams of a liquid is the result of a plurality of strand-like elements within the device.

Another object of my invention is a spraying device in which practically all of the air passing therethrough during operation will be expended in forcing a plurality of parallel streams of air through the exit opening.

Another object of my invention is a spraying device in which a liquid is automatically positioned for conversion into a plurality of moving parallel streams during the operation of the device.

The above-mentioned, and other, valuable features of my device will be evident upon a consideration of my specification and its accompanying drawings.

I have found that greatly increased spraying effects of a liquid can be accomplished in a spraying device of such construction that a plurality of liquid streams is directed to the exit opening of the device.

It would seem that under these conditions each stream is broken up, or atomized, into a fine mist-like spray, much finer in its physical condition than results from the passage of a single stream through the same exit opening.

Irrespective of the theory underlying the operation, the spray thus produced is finer in its physical condition and has a greater spreading effect than those produced where the surface of the liquid forced through the opening is equal to the area of the opening.

In the accompanying drawings illustrating several modifications of my device, similar parts are designated by similar numerals.

In the accompanying drawings,

Figure 1 is a vertical cross-section of one form of a device of my invention.

Figure 2 is an enlarged perspective view of the absorbent material and strand elements of the device of Figure 1, broken away for purposes of classification.

Figure 3 is a vertical cross-section of a modified form of a device of my invention.

Figure 4 is a vertical cross-section of a modified form of a device of my invention.

Figure 5 is a vertical cross-section of a modified form of a device of my invention.

Figure 6 is a top view of a modified end element of Figure 5.

The particular form of the device of my invention illustrated in Figures 1 and 2 comprises a cylindrical member 10, one end of which is closed by the closure member 11, having a centrally positioned opening 12 therein.

Within the cylindrical member 10 is a plunger, or piston, comprising the member 13 of rubber, leather, fabric or other suitable material, having the two metallic discs 14 and 15 upon opposite sides thereof, and a rod 16 passing through centrally positioned openings in the members 13, 14 and 15 and extending through the opening 12 of the closure member 11, the exterior end of the rod 16 carrying the handle 17.

The other end, or exit end, portion of the cylindrical member 10 is covered by the fixedly attached closure member 18 having an opening 19 therein.

Within the cylindrical member 10 and spaced from the end member 18 is a fixedly attached partition 20 having an opening 21 therein, thus forming a chamber 22.

Within the chamber 22 is a disc 23 of absorbent material of felt, asbestos, or other suitable material and having an opening 24 therein.

The opening 19 of the member 18, the opening 21 of the member 20 and the opening 24 of the member 23 are in alignment with each other and I prefer that the opening 19 of the member 18 be of smaller diameter than the opening 24 of the member 23.

Within the opening 24 of the member 23 is a plurality of parallel positioned strand-like elements 25, 25 which may be of fibre, hair, bristles, synthetic resins, wire, glass or other suitable materials.

Positioned below the chamber 22 and fixedly attached to the cylindrical member 10 is a liquid-receptacle 26 having a tube 27 extending from the lower portion of the receptacle 26 into the cham-

ber 22 through an opening 29 in the lower portion of the cylindrical member 10.

The operation of the device is as follows:

In order to first charge the absorbent disc 23 with the liquid 28 in the receptacle 26, the piston is moved inwardly and outwardly a few times, and during each such inward and outward movement a portion of the liquid 28 is drawn upwardly through the tube 27 into contact with the absorbent disc 23.

When the disc 23 has been charged with the liquid 28 for the first time, the operation of the device is as follows: During the first charging of the disc 23, the liquid 28, by capillary attraction or otherwise, has entered the interstices between the strands 25, 25, or the interstices within the strands themselves, or both, dependent upon the material of the strands. An inward movement of the plunger member 13 will force this liquid outwardly through the opening 19 of the end member 18 in the form of a fine spray and will at the same time draw a supply of liquid 28 into the chamber 22 and the disc 23, through the tube 27 and the outward movement will draw some of the liquid 28 from the disc 23 into the strand interstices and at the same time draw an additional quantity of the liquid 28 through the tube 27 into the chamber 22 and the absorbent disc 23.

It will thus be seen that the absorbent disc 23 will be constantly supplied with the liquid 28, and that the interstices of the strands 25, 25 will constantly have a supply of liquid 28 to be sprayed outwardly through the opening 19 of the member 18.

The modified form of my device shown in Figure 3 is similar to that shown in Figures 1 and 2, except for convenience with one hand, the handle 17 is directed downwardly and a second handle 30 is positioned to allow of both handles 17 and 30 to be grasped by one hand, the closing of which will force the plunger inwardly and the opening of the hand will allow the spring 31 to move the plunger outwardly. A second supporting guide member 32 is introduced as an additional guide with the member 11.

The modified form of my device illustrated in Figure 4 is similar to that shown in Figure 3, and is a one-hand operated device, in which the handle 30 is grasped by the hand and the thumbs of the hand employed to move the plunger inwardly by pressure upon the handle 33.

The modified form of my device shown in Figure 5 comprises a cylindrical member having the enlarged portion 34, the reduced forward end portion 35. The 36 rearward end portion of the cylindrical member 34 carries the member 36, extending outwardly 37, and then into the bulbous member 38, having an opening 39 therein. The end portion 36 is turned downwardly forming the cap 40 having an opening 41 therein. A resilient hollow rubber ball 42 is removably attached to the 36—37—37 as shown.

Positioned within the chambers 43 and 44, formed respectively by the cylindrical elements 34 and 35 is a cylindrical absorbent member 45, having a longitudinal opening 46 therethrough. Positioned within the opening 46 is a plurality of parallel strands 47—47 similar to those previously described in the device of Figures 1 and 2. A removable closure cap 48 is carried by the extension portion 35.

The operation of this form of my device is as follows:

The rubber ball 42 is removed and sufficient liquid is introduced through the opening 39 to

saturate the absorbent material 45 and the rubber ball 42 is replaced and the cap 48 is removed. A collapsible pressure will force air through the interstices between the strands 47—47 and outwardly of the opening 41 in the end 40 in the form of a fine spray. The release of the pressure upon the ball 42, will allow air to enter the device drawing some of the liquid in the absorbent material 45 into the strand interstices, in addition to the natural capillary attraction of the strands. It is evident that this spraying operation may be continued as long as there is sufficient liquid within the absorbent material.

Figure 6 represents a multi-opening element which can be substituted for the single opening element 38 of Figure 5.

It will thus be seen that during the operation of my devices, a plurality of parallel liquid streams is forced into the exit opening, and that a supply for the production of such streams is furnished by an absorbent material and formed into such streams through the medium of the parallel strands.

By the word "parallel," I do not limit myself to strands or streams of liquid which are absolutely parallel, but included in that word are elements which are so positioned with respect to each other as to produce the effects described by me.

I do not limit myself to the particular products, sizes, shapes, or positions of parts specifically shown and described, as these are given solely for the purpose of clearly describing my invention.

What I claim is:

1. In a spraying device: a liquid-container compartment having an entrance opening and an exit opening, said entrance opening being adapted to be connected to a source of air pressure; a liquid absorbent member within said liquid-container compartment; and a plurality of closely adjacent parallel strand elements carried by said liquid absorbent member, the terminals of said strand elements being respectively adjacent said entrance opening and said exit opening.

2. In a spraying device: a liquid-container compartment having an entrance opening and an exit opening, said entrance opening being adapted to be connected to a source of air pressure; a liquid absorbent member within said liquid-container compartment; and a plurality of closely adjacent spaced parallel strand elements carried by said liquid absorbent member, the terminals of said strand elements being respectively adjacent said entrance opening and said exit opening.

3. In a spraying device, a liquid-container compartment having an entrance opening and an exit opening; said entrance opening being adapted to be connected to a source of air pressure; a liquid absorbent member within said liquid-container compartment, and a plurality of closely adjacent parallel strand elements carried by said liquid absorbent member, the terminals of said strand elements being respectively adjacent said entrance opening and said exit opening, the passage of air through said entrance opening into said liquid-container compartment forcing a plurality of liquid streams into said exit opening causing said liquid to be emitted in the form of a spray.

4. In a spraying device, a liquid-container compartment having an entrance opening connected to a hollow compressible resilient member and an exit opening; a liquid absorbent member

within said liquid-container compartment and a plurality of closely adjacent parallel strands within said absorbent material, the terminals of said strand elements being respectively adjacent said entrance opening and said exit opening. 5

5. In a spraying device, a liquid-container compartment having an entrance opening connected to a hollow compressible resilient member

and an exit opening; a liquid absorbent member within said liquid-container compartment and a plurality of closely adjacent spaced parallel strands within said absorbent material, the terminals of said strand elements being respectively adjacent said entrance opening and said exit opening.

WILLIAM H. ROSE.