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SPRAYER NOZZLE

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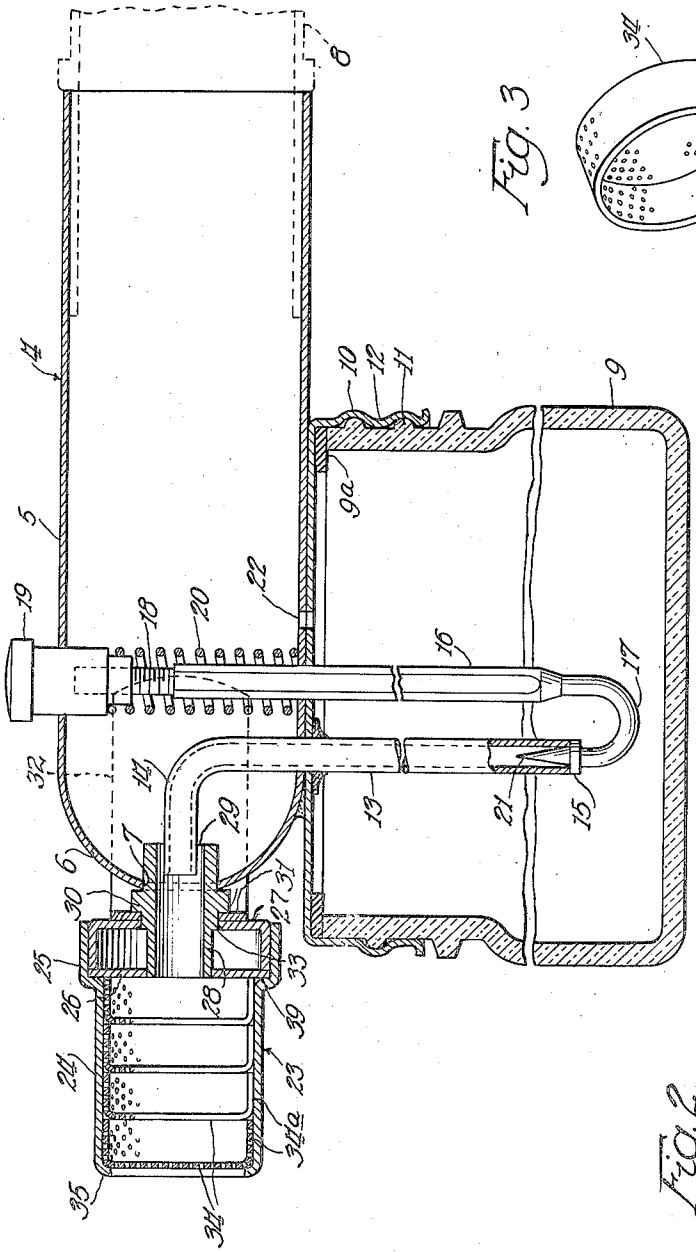


Fig. 1

Fig. 3

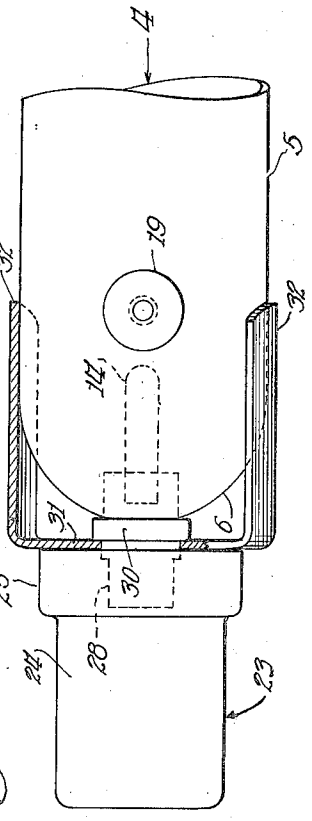


Fig. 2

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SPRAYER NOZZLE

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This invention relates to a foam spray gun for spraying a foamy cleaning compound upon articles which are to be cleaned and the invention relates more particularly to the sprayer nozzle for the gun.

One of the objects of this invention is to provide a sprayer nozzle that breaks down the cleaning compound into a light foam or froth which when discharged by air under pressure discharges in the foam of a spray.

Another object is to agitate the cleaning compound in the sprayer nozzle, whereby to produce the foam.

Another object is to provide a sprayer nozzle which may be readily attached to and detached from a spray gun head.

Another object is to provide a sprayer nozzle composed of a few parts and easily assembled.

Another object is to provide a sprayer nozzle that is highly efficient, durable, simple and comparatively inexpensive.

With these and other objects and advantages in view this invention consists in the several novel features hereinafter fully set forth and more particularly defined in the appended claims.

The invention is clearly illustrated in the drawing accompanying this specification in which:

Fig. 1 is a central longitudinal section through a spray gun equipped with a sprayer nozzle embodying a simple form of the present invention, the reservoir of the spray gun being partly broken away;

Fig. 2 is a plan of the sprayer nozzle partly in section with the spray gun partly broken away; and

Fig. 3 is a perspective view of one of the foraminated discs which break down the cleaning compound into foam.

The views are upon an enlarged scale.

Referring to said drawing, the reference character 4 designates the spray gun as a whole; it is here shown in the form of a cylinder 5 open at one end, its other end being dome-shaped as shown at 6 and formed with a central opening 7. The open end of the cylinder is arranged to be attached to a flexible tubular connection 8 which may lead from the discharge side of a vacuum carpet cleaner or from any other suitable blower or fan (not shown).

A reservoir 9 for the cleaning compound is removably secured to the cylinder 5 as by a cap 10 rigidly secured to the cylinder as by welding it thereto or otherwise. The reservoir and cap are shown as formed with complemental screw threads 11, 12, whereby the reservoir may be readily attached to the cap or detached therefrom. A gasket 9a is interposed between the cap 10 and edge of the reservoir to provide a leak proof joint between the cap and reservoir.

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Leading up from a point adjacent the bottom of the reservoir is a discharge tube 13 which extends through the walls of the cap and cylinder and is secured to the cap as by welding it thereto. The upper end of the discharge tube is bent at right angles to itself as at 14 to lie in coaxial alignment with the opening 7 in the cylinder 5 with its discharge end terminating at a point adjacent the dome end of the cylinder.

A valve 15 controls the inlet to the discharge tube and said valve is connected to a stem 16 by a goose neck 17. The stem extends into the interior of the cylinder, through holes in the cap and cylinder and is formed with a threaded reduced end 18 upon which is secured a push button 19. The push button extends out through the upper part of the wall of the cylinder and a coiled spring 20 interposed between the push button and lower part of the wall of the cylinder functions to yieldably hold the valve 15 closed. A pilot pin 21 projects from the valve into the discharge tube. Registering holes 22 in the cap and wall of the cylinder admit air to the reservoir under pressure from the cylinder 5.

The sprayer nozzle indicated generally by 23 comprises an open ended cylindrical shell 24 having an enlarged end 25 in which are contained a disc 26 and a flanged head 27, held in the enlarged end 25 as by a driving fit. Extending through axially aligned openings in the disc 26 and head 27 and secured thereto is a nipple 28 which is in coaxial alignment with the opening 7 in the dome and extends into the cylinder 5 through the opening 7, with the part of the nipple within the cylinder surrounding the discharge end 14 of the discharge tube 13, there being an air passage 29 between the cylinder and nozzle, here shown as comprising an annular opening formed between the nipple and the discharge tube through which air under pressure may be discharged from the cylinder to and through the nozzle.

The end 14 of the discharge tube 13 being in coaxial alignment with the opening 7, coaxial alignment between the nipple 28 and tube end 14 is assured, thus providing the annular opening 29 between the tube end 14 and nipple 28.

Between its ends the nipple 28 is formed with an annular flange 30 which bears against the dome end of the cylinder and between said flange and the head 27 is secured a spring clip 31 which is formed with two arms 32 that extend along the cylinder and grip the same. The arms 32 are

curved in cross section along lines conforming to the curvature of the cylinder. The nipple may also be formed with a reduced flange **33** which extends through holes in the spring clip and flanged head **27**. The enlargement **25** of the shell provides a shoulder or stop **39** for the disc **26** and head **27**.

In the hollow of the shell between the disc **26** and the discharge end of the shell are several foraminated flanged discs **34** composed of wire mesh or perforated light gage sheet metal struck up with suitable dies to form a cup-like or flanged discs. The flanges **34***a* of the discs bear against the inner face of the shell and each flange **34***a* bears against the next adjacent disc **34** except the innermost one which bears against the disc **26**. The discharge end of the shell **24** is formed with an inturned flange **35** which retains the flanged discs **34** in the shell at the open end thereof.

In use the reservoir **9** is filled with a suitable liquid cleaning compound and air under pressure is admitted to the cylinder and reservoir and discharges through the sprayer nozzle. By depressing the push button **19**, the valve **15** is unseated permitting the air under pressure in the reservoir to discharge the cleaning compound into the sprayer nozzle where it encounters the several foraminated discs and is blown through the perforations thereof, is thereby agitated and broken down into a foam condition. This is augmented by the air under pressure flowing through the nozzle. The discharging air reduces the foam to a spray as it is being discharged from the nozzle to the article to be cleaned. The article is then wiped off as is customary.

Any suitable liquid cleaning compound which can be broken down into a foamy condition may be used. The compound may comprise a soapy solution or it may be composed of chemicals such as are used in the "foam" method of cleaning. A spray gun equipped with the above described sprayer nozzle may be used to spray a cleaning compound foam upon upholstery, carpets, rugs or any other articles.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence, I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a foam spray gun, the combination of a pneumatic spray head, a sprayer nozzle shell having a nipple extending into and adjustably secured upon said head, a discharge tube having a discharge end in coaxial alignment with the shell and extending into the nipple, there being an annular air inlet opening to the shell around the discharge tube and a plurality of spaced foraminated discs secured in said shell.

2. In a foam spray gun, the combination of a pneumatic spray head, a sprayer nozzle shell removably secured and adjustably mounted upon said head, said sprayer nozzle shell including a nipple providing an air inlet from the head to the shell through which air under pressure is forced through the sprayer nozzle shell, a discharge tube having a discharge end in coaxial alignment with the nipple of the shell forming an annular opening, a plurality of spaced flanged foraminated discs secured in said shell, said nipple permitting adjustment of the spray head with respect to the end of the discharge tube.

3. The combination with a pneumatic spray head including a discharge nozzle adapted to be connected to a source of air under pressure and a reservoir for a cleaning compound carried by the head, of a sprayer nozzle shell, a nipple secured to and extending from the shell into the spray head, a centrally apertured disc and a centrally apertured head secured at one end in the shell with the nipple secured in the disc and head and a plurality of spaced foraminated discs secured in the shell between the centrally apertured disc and the other end of the shell.

4. The combination with a pneumatic spray head including a discharge nozzle adapted to be connected to a source of air under pressure and a reservoir for a cleaning compound adapted to be carried by the head, of a sprayer nozzle shell formed with an enlarged end, a nipple extending from the shell into the discharge nozzle of the spray head, a centrally apertured disc and a centrally apertured head secured in the enlarged end of the shell with the nipple secured in the disc and head and a plurality of spaced foraminated discs secured in the shell between the centrally apertured disc and the other end of the shell.

5. As an article of manufacture, a foam sprayer nozzle adapted to be connected to a discharge opening of a discharge nozzle of a spraying device, said foam sprayer nozzle comprising a shell having an enlargement at one end and an inturned flange at the other end, a disc and a flanged head secured in the enlarged end of the shell, a nipple secured in said disc and flanged head, said nipple adapted to be mounted within the discharge opening of the discharge nozzle and a plurality of spaced foraminated discs secured in said shell with one endmost disc bearing against said flanged end with the innermost one bearing against said first mentioned disc.

6. A foam sprayer nozzle adapted to be detachably mounted on a discharge nozzle of a spraying device, said foam sprayer nozzle comprising a shell open at both ends, a centrally apertured disc and a centrally apertured flanged head secured in one end of the shell, a nipple secured in the apertured flanged head and disc and projecting therefrom, a plurality of spaced flanged foraminated discs confined in said shell between the first named disc and the other end of the shell, and resilient means mounted on said foam sprayer nozzle and adapted to detachably mount said foam sprayer nozzle on said discharge nozzle.

7. A foam sprayer nozzle comprising a shell, a plurality of flanged foraminated discs secured in said shell with the flanges of the discs spacing them apart, a flanged nipple secured to said shell and projecting from one end thereof and a spring clip secured to said shell by said nipple and adapted to adjustably secure the nozzle upon a spray gun.

8. In a foam spray gun adapted for spraying a foam, the combination of a pneumatic spray head adapted to discharge a stream of air under pressure and including a discharge nozzle formed with a discharge opening, a reservoir for a liquid cleaning compound adapted to be placed under pressure, said spray head also including a discharge tube extending from the reservoir into the discharge nozzle and forming an air passage about the end of the discharge tube contiguous to the discharge opening of the nozzle whereby the liquid is adapted to be sprayed, and means

comprising a series of foraminated, spaced discs for foaming the liquid discharged from the spray head by discharging the sprayed liquid and the stream of air, under pressure, through said air passage about the discharge tube and through the foraminated, spaced discs, whereby the foam produced from the liquid cleaning compound is adapted to be sprayed upon a surface to be cleaned.

9. A spray foam gun for either spraying a liquid or spraying a foamed liquid comprising a pneumatic spray head adapted to discharge a stream of air under pressure and including a discharge nozzle formed with a discharge opening, a reservoir for receiving liquid to be placed under pressure, said spray head also including a discharge tube extending from the reservoir into the discharge nozzle and forming an air passage about the end of the discharge tube contiguous to the discharge opening of the nozzle, and quickly detachable means comprising a series of foraminated, spaced discs for foaming the liquid discharged from the spray head by discharging the sprayed liquid and the stream of air, under pressure, through said air passage about the discharge tube and through the foraminated, spaced discs, whereby the spray foam gun is adapted for spraying a liquid with the means for foaming the liquid detached, and for spraying a foam with the means for foaming the liquid attached.

10. The combination with a spray gun adapted to discharge a stream of air under pressure and having a reservoir for receiving liquid to be placed under pressure, a spray head having a discharge opening, and a discharge tube extending from the reservoir contiguous to the opening in the spray head, of a spray nozzle attachment adapted for foaming the liquid, said attachment comprising a shell adapted to receive a plurality of foraminated, spaced discs for foaming the liquid discharged from the discharge tube, means adapted to be mounted within said discharge opening for discharging the stream of air, under pressure, within a reduced air discharge passage formed by said means about the discharge tube and through the foraminated, spaced discs, whereby foam is produced from the liquid discharged from the discharge tube, and complementally formed means for detachably mounting the spray nozzle on the spray gun contiguous to the discharge end of the discharge tube.

11. As an article of manufacture, a foam spray nozzle attachment for a spray gun adapted to discharge a stream of air under pressure, and including a discharge nozzle formed with a discharge opening and comprising a reservoir for receiving liquid to be placed under pressure, said spray gun also including a discharge tube extending from the reservoir into the discharge nozzle opening and defining an air passage about the end of the discharge tube contiguous to the discharge opening of the nozzle, said attachment comprising a shell adapted to receive a plurality of foraminated, spaced disks for foaming the liquid discharged from the discharge tube, means adapted to be mounted within said discharge opening of the nozzle for discharging the stream of air under pressure within a reduced air passage defined by said means about the discharge tube and through the foraminated, spaced disks, whereby foam is produced from the liquid discharged from the discharge tube, and complementally formed means for detachably mounting the spray nozzle on the spray gun contiguous to the discharge end of the discharge tube.

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