Nov. 27, 1951 G. H. BRAMHALL 2,576,668

CONTROLLABLE PRESSURE MEANS FOR SPRAYING LIQUIDS AND THE LIKE

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Fig. 1.

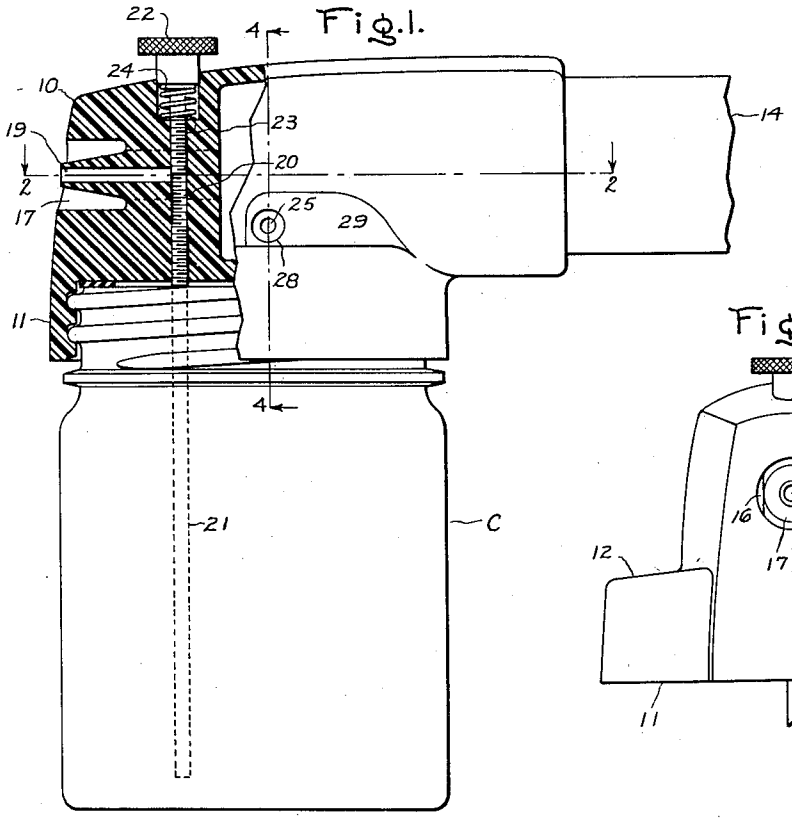


Fig. 3.

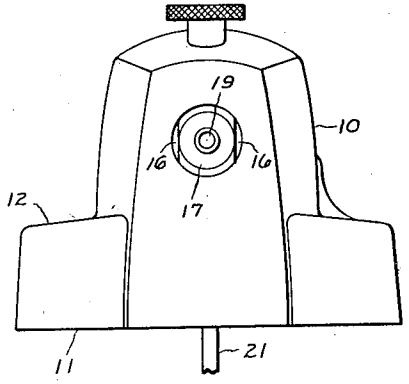


Fig. 4.

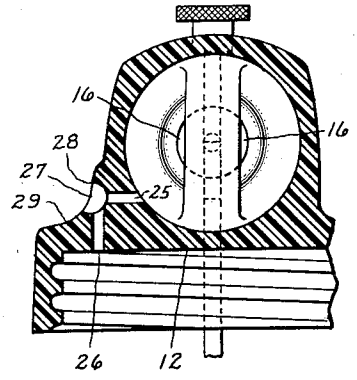
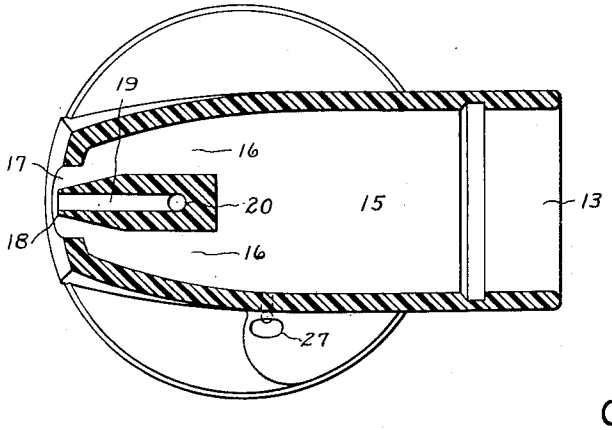


Fig. 2.



Inventor:
George H. Bramhall,

by Sheridan C. Biggs
His Attorney.

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CONTROLLABLE PRESSURE MEANS FOR SPRAYING LIQUIDS AND THE LIKE

George H. Bramhall, Cleveland, Ohio, assignor to General Electric Company, a corporation of New York

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3 Claims. (Cl. 299—89)

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This invention relates to an improved means for spraying and atomizing liquids.

Although the invention is not restricted to such use, its adaptability and ease of operation by unskilled persons make it advantageous for use in spray heads used as an accessory for conventional vacuum cleaners, which, as is well known, provide a substantial volume of air at relatively low pressure. In a preferred form, the sprayer head is applied directly to a jar containing the material to be sprayed, and is of such size and shape as to be comfortably held in the hand of the user.

Among the objects of the invention are to provide an improved sprayer head having non-mechanical, manually controllable means for creating air pressure within the container sufficient to convey the contents to the spray nozzle, thereby providing simple means for starting and stopping the spray; to provide means to control the spray action without requiring the manipulation of mechanical valve devices; and to provide a sprayer head which may be easily and thoroughly cleaned after use.

In the accompanying drawings, Fig. 1 is a side elevation, partly in section, showing a presently preferred embodiment of the invention; Fig. 2 is a plan section taken through the sprayer head on lines 2—2 of Fig. 1; Fig. 3 is a front elevation of the sprayer head with a portion of the feed tube broken away; and Fig. 4 is a vertical elevation through a portion of the sprayer head taken on lines 4—4 of Fig. 1.

Referring now to Fig. 1 my invention includes a spray head 10 of molded plastic or other lightweight material. As is evident from the substantially full size views in Figs. 1 and 3, the size and shape of the head are such that it may be comfortably held in the hand of the user with the palm resting on the top and the thumb and fingers grasping the respective side walls. A skirt 11 depending from a bottom wall structure 12 provides for pressure tight securement to the mouth of a jar or other container C, as shown. A socket 13 suitably receives and secures the end of a fitting 14 of a vacuum cleaner hose or equivalent air pressure conduit. Either frictional securement or positive latching means may be employed, as is well known in the art. An air pressure chamber 15, which in effect is a continuation of the socket 13, is formed with air passages 16 which merge into an air blast tube 17 surrounding the concentrically disposed liquid discharge nozzle 18. As is apparent from Figs. 3 and 4 the air passages have large area inlets within chamber 15, and relatively smaller discharge ports at the sides of nozzle 18. The low pressure air in chamber 15 is converted to a high velocity blast discharging from tube 17. Nozzle 18 has a passage 19 communicating with a vertical bore 20. Desirably said bore is internally threaded to provide for removably attaching a feed tube 21 which extends to a point adjacent the bottom of jar C, and for receiving a thumb screw 22 having an elongate shank 23 forming valve means by means of which the flow from the tube 21 into the passage 19 may be controlled. A spring or the like 24 serves to maintain the thumb screw in adjusted position.

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Air discharging about the air blast tube 17 at high velocity may exert an aspirating effect on the contents of the jar. However, the present invention provides means for diverting a volume of pressure air from the chamber 15 into the container to enforce flow of material from the container through the feed tube and then to the nozzle, where it will enter the air blast for discharge from the spray head in finely divided state. As shown in Fig. 4, a passage 25 provided in the lower side wall of chamber 15 communicates directly with the outer atmosphere immediately above the lower wall 12. A breather passage 26 extends through bottom wall 12 for communication with the interior of the container. At the junction of said passages there is provided a substantially hemispherical pocket 27, of which the outer edge 28 provides a valve seat. As is apparent from Figs. 1 and 4 the diameter of the pocket is substantially larger than that of the respective passages 25, 26. Adjacent pocket 27, the head member is formed with a finger rest 29 convenient to the thumb of a right handed person or the index finger of a left handed person. When the head is held so that the socket 13 is just forward of the heel of the hand, the thumb or forefinger will rest naturally on the rest 29 and will cover the pocket 27. By pressing the finger against the pocket edge 28 to prevent escape of air, pressure will be exerted on the surface of the contents of the container, providing positive flow through tube 21 to the air blast. If the finger is lifted from the pocket 27, the pressure air will entirely by-pass the container, and the discharge will stop. The control of air at pocket 27 thereby provides means for starting and stopping the spray very quickly, and without disturbing the setting of control valve screw 22. The user quickly acquires the manual dexterity necessary to exert the desired control. A further advantage afforded by the invention is that the

operator can exercise positive control without having to hold his finger on a spring biased valve or other moving part.

It will be noted that all passages are readily accessible for cleaning. The removal of tube 21 and screw 22 exposes passages 19 and 20 for the introduction of a cleaning tool. Passages 25 and 26 may be cleaned by passing a tool through the pocket 27.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A sprayer, comprising a head member of such size as to be comfortably grasped by the hand of the operator, said head having a bottom wall formation for pressure-tight securement to the mouth of a container, a pressure chamber above said wall for receiving air under pressure, a discharge nozzle, a feed tube communicating with said nozzle and extending through said bottom wall into said container, velocity flow passageways communicating with said pressure chamber and terminating in an air blast tube surrounding said nozzle, a first passageway for air extending through the side wall of said head member adjacent the bottom wall thereof to afford direct communication between the pressure chamber and the atmosphere, a second passageway intersecting said side wall passageway and opening into said container, the junction of said passageways comprising a relatively deep pocket having an outer opening immediately above said bottom wall, said opening being substantially larger than the diameter of said passageways, and a finger rest formed on said head adjacent said outer opening to accommodate a finger of the hand holding said head member for closing said side wall opening and diverting air under pressure from said first passageway to said second passageway when air pressure is to be exerted on the contents of said chamber to enforce flow through the feed tube to the nozzle for discharge therefrom.

2. A spraying device, comprising a spray head for attachment to the mouth of a container of material to be sprayed, said spray head being of such size and shape to function as a handle to be grasped by the operator, a pressure chamber for attachment to a source of air under pressure, a discharge nozzle communicating with said container, an air blast tube disposed about said nozzle, passageways communicating between said pressure chamber and said air blast tube to discharge air from said air blast tube at relatively high velocity, a vent passageway in said spray head communicating directly between the outer atmosphere and said container, said passageway terminating in a sidewardly facing pocket of relatively large volume in the outer wall of said head, and a second passageway communicating between said pressure chamber and said pocket, whereby when said pocket is covered, as by the finger of the operator, a quantity of air under pressure will flow substantially directly from the pressure chamber to the container to enforce flow of the contents thereof to said nozzle to be entrained by the air blast for discharge in finely divided state.

3. A spraying device, comprising a spray head for attachment to the mouth of a container of material to be sprayed, a pressure chamber for attachment to a source of air under pressure, a discharge nozzle communicating with said container, an air blast tube disposed about said nozzle, passageways communicating between said pressure chamber and said air blast tube to discharge air therefrom at relatively high velocity, and means for controlling material flow from said container to said nozzle and then into the discharging air blast, comprising a first passageway communicating between the outer atmosphere and said container and a second passageway intersecting said first passageway adjacent a side wall of said spray head and communicating with said pressure chamber, said side wall having an opening on its outer surface where said passageways intersect, the size and position of the side wall opening being such that it can be closed by a finger of the hand holding the spray head whereby when spray discharge is desired the operator may close the opening to create air pressure within the container sufficient to cause the contents thereof to flow to the nozzle, or optionally flow may be immediately stopped by uncovering said opening to prevent the generation of the necessary pressure within the container.

GEORGE H. BRAMHALL.

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