Dec. 10, 1929. H. J. BRAGDON 1,738,757

SPRAYER AND THE LIKE

Filed Sept. 30, 1927

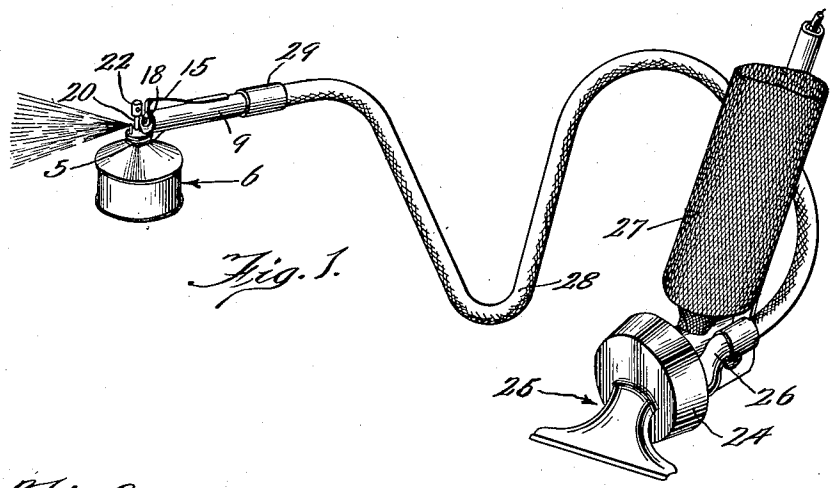


Fig. 1.

Fig. 2.

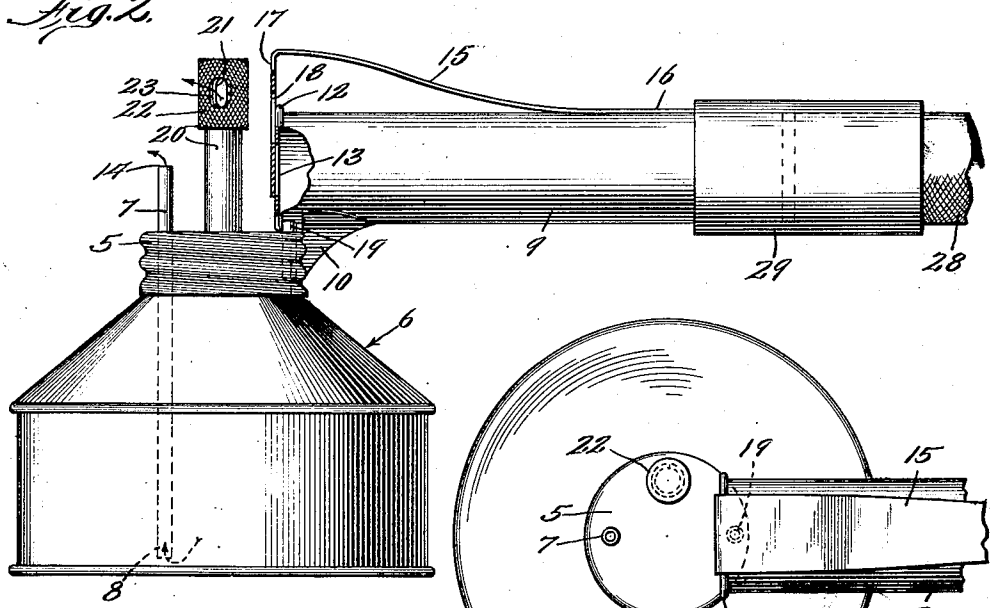


Fig. 3.

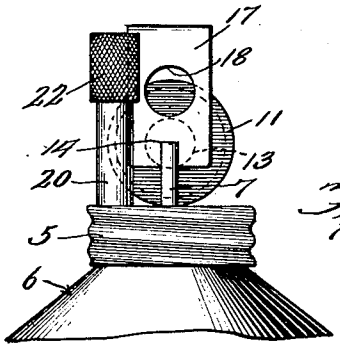


Fig. 4.

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UNITED STATES PATENT OFFICE

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SPRAYER AND THE LIKE

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This invention has to do with improvements in sprayers of the general type intended for spraying insecticides, germicides and other similar materials, particularly in homes and other similar locations. The sprayer herein disclosed is also very well adapted for spraying lacquers and other similar finishing materials.

One object of the invention is to provide a sprayer construction which can be very cheaply manufactured and which can be used in direct conjunction with the can or other container in which the liquid material is delivered.

Another feature of the invention relates to the provision of a construction such that the volume of material sprayed can be readily regulated by a very simple form of valve arrangement.

Another feature of the invention relates to the provision of a construction such that the proper spraying action may be secured even with an air blast of very small pressure such as is delivered by a relatively small size centrifugal blower.

More particularly it is an object of the invention to provide a sprayer so arranged that it can be very satisfactorily operated by the blast delivered from the pressure side of a relatively small rotary blower such as is provided on a vacuum cleaner. This will make it possible to operate the device by direct attachment to a vacuum cleaner or other domestic equipment which is readily available.

In connection with the foregoing I have found that the satisfactory operation of the sprayer by the use of the relatively low pressure and large volume of blast delivered by such a centrifugal blower requires that the air discharge orifice and the orifice through which the liquid material is delivered should bear certain relationship to each both as respects their sizes and their relative position. The size of the air orifice should be relatively large so as to be able to deliver a relatively large blast of air; and this circumstance makes it desirable to use a special form of air control valve which is capable of readily controlling such an air blast.

It is also desirable to assist the delivery of the liquid material up to the orifice by placing said material under a slight pressure. This pressure may be derived from the air supply which is used for the air blast. I have also provided means for regulating the amount of this pressure so that the lifting action may be readily adjusted.

Other objects and uses of the invention may appear from a detailed description of the same which consists in the features of construction and combinations of parts hereinafter described and claimed.

In the drawing:

Figure 1 shows a perspective view of my improved sprayer showing the same coupled up to the discharge side of the rotary blower of the vacuum cleaner;

Fig. 2 shows a side elevation of the sprayer itself on enlarged scale as compared to Fig. 1, the device being shown partly in section;

Fig. 3 shows a plan view corresponding to Fig. 2; and

Fig. 4 shows a detail fragmentary elevation of the upper portion of the sprayer taken at right angles to Fig. 2.

Referring first to Figs. 2, 3 and 4, the sprayer therein illustrated includes a cap 5 which is intended to be screwed down onto the neck of the can 6 wherein the liquid material is contained. This can 6 may be any suitable container; but it is conveniently the container in which the liquid material is originally delivered to the householder or other user.

At one side the cap 5 is provided with a vertical liquid delivery tube 7 which reaches down inside of the can 6 to the point 8 close to the floor of the container. The lower end 8 does not come close enough to the floor to cause an actual sealing action, so that the liquid material will enter through the lower end 8.

Opposite to the position of the upper end of the tube 7 there is provided the air pipe 9. The front end of this pipe is supported on the cap 7 by means of a bracket 10 so that the parts are rigidly connected together. The front end of the pipe 9 is closed by a plate 11, which may be held in place by folding the

plate and pipe together as shown at 12 in Figs. 2 and 3.

The plate 11 is provided with a relatively large central orifice 13; and the extreme upper end 14 of the tube 7 is directly in line with the centre of this orifice. The pipe 9 is generally of substantially 1 inch in diameter and the orifice 13 is substantially one half inch in diameter; and the end plate 11 is set back approximately 1 inch from the position of the tube 7. Consequently when the orifice 13 is fully uncovered there is established a definite blast relationship as between the sizes and positions of the parts. Ordinarily, also the air pressure in the pipe 9 will not exceed approximately 5 pounds per square inch although this statement is not intended as a limitation on the usefulness or operation of the device.

There is a spring plate 15 the rear end 16 of which is secured to the pipe 9 at a substantial distance back of the position of the plate 11. The front portion 17 of this spring plate is folded down at right angles and directly in front of the plate 11 which closes the the end of the pipe 9. The portion 17 will slide up and down in direct contact with the plate 11 as the spring 15 is pressed down or is released by the thumb or hand of the user. The normal position is the raised position illustrated in Fig. 2.

The portion 17 is provided with an orifice 18 of substantially the same size as the orifice 13, and the parts are so proportioned that when the spring 15 is fully raised the portion 17 thereof below the position of the opening 18 will close the port 13; whereas when the spring 15 is pushed down the opening 18 will register to a greater or less extent with the port 13, thus making it possible to cover and uncover the port 13 to a greater or less degree as desired by simply depressing the spring 15 the necessary amount.

The foregoing arrangement is a very simple one for normally cutting off the supply of air blast, while at the same time making it possible to control the amount of the air blast in a very simple manner by simply depressing the spring.

There is a tube 19 which reaches from the lower front portion of the pipe 9 down through the cap 5. This tube will insure a constant delivery of air pressure into the container 6 as long as pressure exists in the pipe 9. The tube 19 is relatively small in size. There is another relatively large tube 20 reaching up from the cap 5 and at one side thereof. The tube 20 therefore does not stand between the orifice 13 and the liquid tube 7 and therefore does not interfere with the air blast.

The tube 20 has at its upper end a slotted orifice 21; and there is a cap 22 which is movably mounted on the upper end of the tube 20. This cap 22 has an orifice 23 which can be registered to a greater or less extent with the orifice 21 by merely adjusting the position of the cap 22. Consequently the rate at which air will leak out from the container 6 through the tube 20 can be readily regulated by adjusting the position of the cap 22.

The air pressure which will exist inside of the container 6 will depend upon the amount of opening of the orifice 21 as adjusted by the cap 22 since this will regulate the rate at which air is allowed to leak out, compared to the delivery of air into the container through the tube 19.

I have found that the foregoing arrangement is an admirable one for the delivery of relatively large blasts and sprays of material with an air supply of relatively low pressure but large volume. This device therefore may be readily used in connection with the rotary blower or centrifugal blower 24 of a vacuum cleaner 25. The discharge connection 26 of said rotary blower normally connects to the lower end of the dust bag 27 of the vacuum cleaner. By merely disconnecting said lower end and substituting the hose 28 which is attached to the connection 26 of the rotary blower, the blast of air can be delivered to the pipe 9 of the sprayer by a slip connection 29. This slip connection may be slipped over the end of the air pipe 9 of the sprayer; and for this purpose said air pipe 9 should be made of substantially the same size as the flexible hose 28 from the vacuum cleaner. It happens that this size of approximately one inch in diameter is also the proper size to insure a satisfactory delivery of air blast for the sprayer. Consequently there is a peculiar relationship between the use of the rotary blower and centrifugal blower of a vacuum cleaner and the operation of a sprayer embodying the features of the present invention.

Due to the relatively large size of the air pipe 9, together with the relatively large size of the opening 13, and the relative positioning of the delivery end 14 of the liquid tube 7 with respect to the air opening 13, it is possible to secure very satisfactory operation with an air blast of not to exceed substantially five pounds per square inch. Furthermore, it will be noted that the air hose 28 has on one end means for direct attachment to the delivery connection 26 of the rotary blower 24, and on the other end has a slip coupling, 29 of proper size to fit directly onto the air pipe 9 of the sprayer.

While I have herein shown and described only certain embodiments of the features of my present invention still I do not intend to limit myself thereto except as I may do so in the claim.

I claim:

A device of the class described comprising in combination a cap adapted for attachment to the upper portion of a liquid container, a

relatively large air pipe having its end portion secured to one side of said cap and facing directly across the cap, a cover plate extending across and closing said end portion, there being a central opening in said cover plate, a liquid delivery tube extending through the cap at the side opposite to the position of said air pipe, said liquid delivery tube being of relatively small size and having its upper end terminating substantially in line with the central opening in the cover plate aforesaid, a spring strap having one end secured to the top side of the air pipe and extending lengthwise of said pipe to the cover plate end thereof, the end of said spring strap being turned downwardly and overlying the cover plate said spring strap normally standing with its free end portion in raised position with respect to the air pipe, an opening in the end portion of the spring strap normally standing above the position of the opening in the cover plate, whereby when the spring strap is depressed the opening of its end portion will register substantially with the opening in the cover plate, an air connection from the end portion of the air pipe through the cap to the interior of the liquid container, a vent pipe extending upwardly from the cap and having a vent opening in its upper end, and a cap on the upper end of said vent pipe, said cap being provided with an opening adapted to register with the opening of the vent pipe when the cap is turned into the proper position, substantially as described.

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