

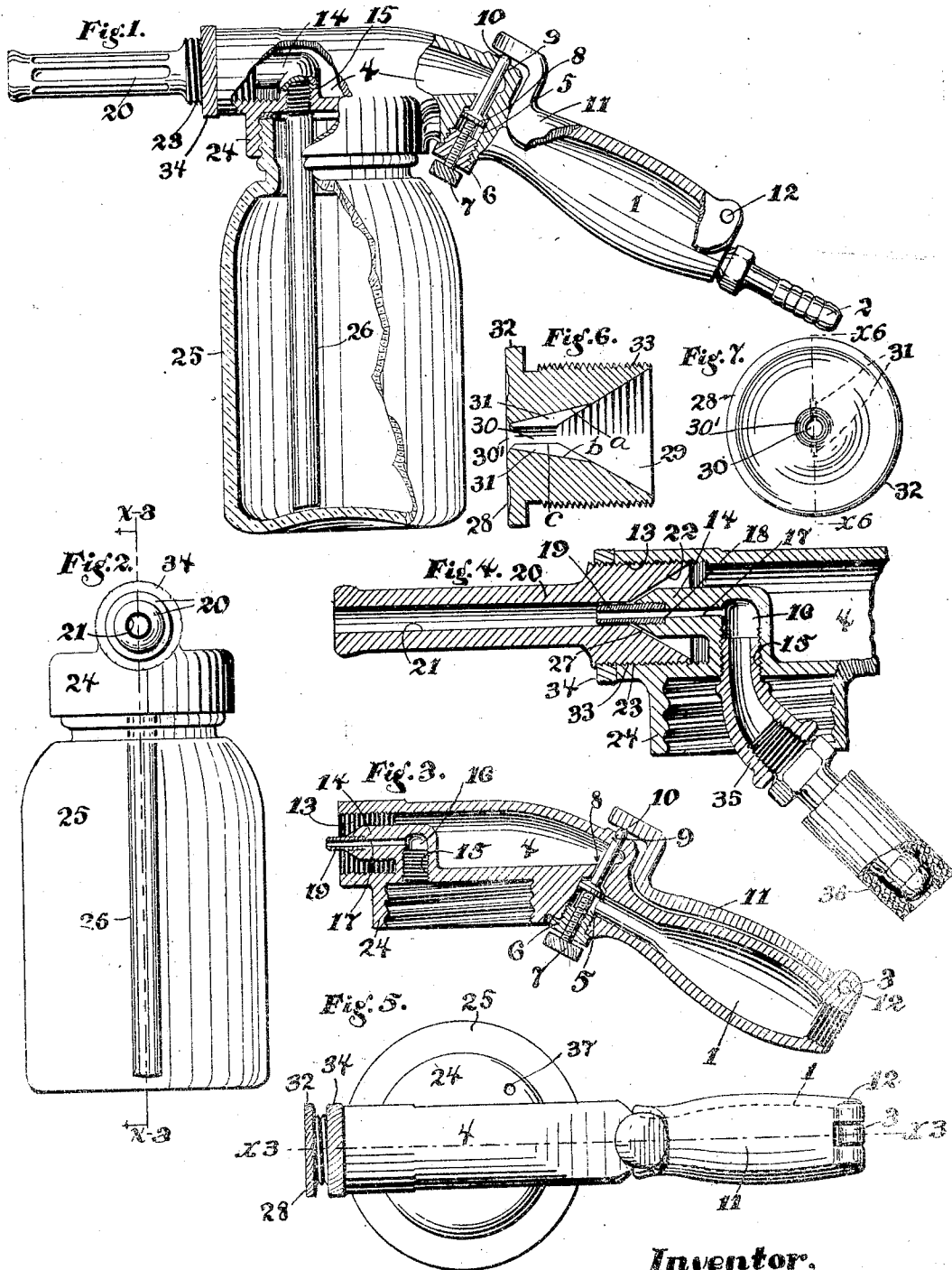
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PAINTING, CLEANING, SAND BLASTING, AND GENERAL UTILITY AIR BRUSH

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UNITED STATES PATENT OFFICE.

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PAINTING, CLEANING, SAND-BLASTING, AND GENERAL UTILITY AIR BRUSH.

Application filed January 17, 1922. Serial No. 529,906.

To all whom it may concern:

Be it known that I, PURLING ALLEN BLEAKLEY, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Painting, Cleaning, Sand-Blasting, and General Utility Air Brush, of which the following is a specification:

10 An object of this invention is to provide means whereby air pressure may be utilized to enable a workman to rapidly and readily cleanse automobiles and the like at one operation and to paint or varnish the same at
15 another operation, and which when desired, can be utilized to smooth, cleanse or cut away surfaces upon which such operations are desired to be performed.

20 A broadly new, basic and pioneer feature of the invention is the provision of an air brush in which the mixing with the air blast, or introduction into the air blast, of the liquid or solid to be applied to the surface to be treated, is effected inside the device.

25 An object of the invention is to make simple provision whereby the operator will have perfect control over the application of the blast.

30 The appliance is preferably constructed for use with interchangeable nozzles for different characters of work and will so be shown and described herein.

35 An object of the invention is to make provision whereby the suction that supplies the blast with the liquid or solid to be applied, can be regulated accurately and with ease.

40 Another object is to insure against accidental change of the blast during operation.

45 An object of the invention is to provide a self-contained air brush the maximum blast of which can be predetermined without the aid of a reducing or air regulating valve on the air line.

50 Some of the advantages gained by this invention are, applicability for the direct use of various air pressures ranging from paint shop pressure which is about 50 pounds per square inch, up to iron foundry pressure that is generally about 200 pounds per square inch; and an object of the invention is to provide a construction whereby the device can be used with moist air as well as
55 with dry air in cases where the moist air will not interfere with the work in hand.

An object of this invention is to provide a removable container for the fluid or solid to be ejected. Thus either the said fluid can be carried with the brush, or the container holding said fluid can be detached and a standard street-L inserted to connect with a water, gasoline, paint, or other supply of fluid, through a flexible tube and a hose connection attached to the street-L. The threaded connections concerned in this last feature are therefore preferably of standard dimensions. This feature permits working with the air brush in any position whatever, thus facilitating work on under parts of stationary objects.

Another object of the invention is to make provision whereby the brush will apply paint or varnish of the usual consistency used by a hand brush, and in this respect I have been able to use with an air brush the heaviest forms of asphalt paint which heretofore it has not been possible to apply with an air brush. Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detail description and the appended claims.

The accompanying drawing illustrates the invention as adapted to two forms of nozzle.

Figure 1 is an elevation of a general utility air brush constructed in accordance with this invention and set up ready for use. Portions are broken away to expose interior parts.

Fig. 2 is an elevation of the forward end of the device as shown in Fig. 1.

Fig. 3 is a longitudinal section on line x^x , Fig. 2 omitting the nozzle and the container.

Fig. 4 is a broken axial section of the air brush detached from the container and supplied through a hose.

Fig. 5 is a plan of the brush shown in Fig. 1 and provided with a different form of nozzle.

Fig. 6 is an axial section on line x^x , Fig. 7, of the nozzle shown in Fig. 5.

Fig. 7 is an elevation of the forward end of the nozzle shown in Figs. 5 and 6.

The main body of the device is constructed as a single casting and comprises the hollow air conducting handle 1 having the air hose connection 2 and the valve grip lug 3 on the upper side at the inlet end of the handle. In front of the handle is the pressure equalizing air chamber 4 with which the passage of the hollow handle

connects through the valve chamber 5 that is threaded at the underside of the handle to receive the externally threaded valve stop bushing 6, which is centrally bored and tapped to receive the valve regulating screw 7 that extends into the valve chamber 5 and is adapted to limit the opening of the valve 8 according to the depth to which the screw is screwed through said bushing.

The butt of the air chamber 4 is provided with a valve stem guide 9 through which the valve stem 10 projects to be acted upon by the valve grip 11 that is pivoted by pivot 12 to the lug 3 at the inlet end of the handle.

The exterior of the handle and the valve grip are conformed to the palm of the hand so as to be easily held in and operated by one hand of the user. The air chamber 4 terminates at its forward end in an internally threaded nozzle connection 13 and in the ejector nozzle 14 which has a frusto-conical forward end.

The ejector nozzle is provided with a supply pipe connection 15, a supply chamber 16 and an outlet channel 17 which terminates in a threaded connection 18 into which the nozzle tip 19 is screwed.

Various spray nozzles may be applied according to the purposes of the user and the character of the work to be performed; and in Figs. 1, 2 and 4, is shown at 20 an elongated nozzle with a gradually forwardly widening or expanding bore 21 so that there will be a gradual expansion of the expansible medium as it carries the liquid or the solid medium toward the surface to be treated.

The receiving end of the spray nozzle is provided with a conical bore 22 tapering toward and opening into the smaller end of the expanding bore; and the forward end of the ejector nozzle is frusto-conical at an angle corresponding to the conical cavity 22; and the connection end 23 of the nozzle 20 is threaded into the threaded connection 13 to adjust the walls of the conical cavity 22 to the frusto-conical tip of the ejector nozzle 14. The construction is such that by screwing the spray nozzle deeply into connection 13 the walls of the conical cavity 22 will fit upon the tip of the ejector nozzle and entirely cut off the air; and by adjusting the spraying nozzle, air can be caused to flow around the tip of the ejector in any volume within the limits of the device.

By screwing the nozzle outward, the volume of air is increased and by screwing it in, such volume is decreased; thus increasing or decreasing as the case may be, the amount of suction on the duct of the ejector nozzle.

When the nozzle 20 is screwed out, without otherwise changing the conditions, the suction is decreased.

The air chamber 4 is provided on its under side with a connection cap 24 to secure the chamber to a coating or other material supplying container as a glass jar 25 adapted to contain the coating or abrading liquid or solid to be operated with; and from which the same is delivered to the spray nozzle 20.

26 indicates coating or other material delivering means in the form of a suction tube extending down to near the bottom of the material supplying container 25 in the usual manner.

Any desired number of nozzle tips, not shown, may be provided to be interchanged with tip 19 screwed into the ejector nozzle; such nozzle tips having different diameters of bores, as desired.

The compressed air from hollow handle 1, acts to hold the valve 8 seated. The valve grip 11 extends forwardly to act upon the supply valve 8 to return it against the air pressure; and the valve regulating screw 7 is adjusted to regulate the extent to which the valve may be opened by the valve grip; thus determining the maximum flow of air to the air chamber 4.

This arrangement in connection with the adjustability of the nozzle 20 by which the capacity of the compressed air ejector orifice 27 can be established, enables the operator to use the air with perfect freedom by fully compressing the valve grip toward the handle. When the valve grip is gripped, the full pressure of air is on, and the freedom of supply can be predetermined by adjustment of the regulating screw 7 according to the ejector orifice 27 around the ejector nozzle 14.

In the form of spraying nozzle 20 shown in Figs. 5, 6 and 7, the conical cavity 29 opens forwardly through a more or less elongated outlet 30 of circular form rapidly widening at its outer end 30' and provided with two oppositely arranged lateral channels 31, the outside walls *a*, *b* of which converge toward the nozzle outlet, and the flat parallel side walls *c* of which, serve to direct the fluid in flat form.

The nozzle is provided with a milled head 32 so that it may be easily screwed in and out, and adjusted to bring the slots to position for throwing the flat spray at a vertical, a horizontal, or other angle to the axis of the container. The nozzle 20 is shown fluted so as to be easily turned by hand. Both the nozzles 20 and 28 are provided with threaded inserts 33 upon which a jam nut 34 is screwed for the purpose of fixing the nozzle to any adjusted position by screwing the jam nut tightly against the end of the main body of the device.

When it is desired to use a piped supply of fluid to be sprayed, container 25 can be removed, and the suction tube 26 detached.

A street-L 35 of convenient angle can be inserted at the spray pipe connection 15 which is of stock dimensions. Then said piped supply of fluid can be led through a flexible tube from a hose connection 36 which is screwed into the free end of the street-L.

In practical operation the user will set the device according to the requirements and then will clasp the handle and the valve grip in one hand; upon pressing the grip to open the regulating valve, the air will flow into the main chamber 4 and out through the nozzle in an obvious manner producing suction through the pipe 26 to draw the liquid or solid material from the container 25, and to drive it to the appropriate work.

For cleaning an automobile, the nozzle 20 will be mounted as shown in Figs. 1, 2 and 4, and the can 25 may be filled with soap suds, distillate, gasoline or any other liquid adapted to perform the cleaning required.

Likewise the can 25 may be supplied with sand, if sand blast work is desired, or with paint or with varnish if paint or varnish is required.

Body polish, for polishing an automobile; or dye for dyeing the top, may be supplied to the container 25 at the will of the operator, and any substances adapted to flow under the application of air pressure, can be projected through the nozzle at the pleasure of the operator. The vent 37 through the cap 24 serves to supply the atmospheric pressure to cause the substance in the container 25 to flow into the pipe 26 in response to the vacuum produced at the ejecting outlet.

The spraying nozzle 28 is adapted to screw back to receive the tip 19 which may, at one position of the parts close off all of the passage through the nozzle 19 excepting that afforded by the channels, thus to give a fan-like jet or spray. This nozzle 28 is preferable for applying body polish, paint, varnish, top dye and lacquers of all kinds.

I claim:—

1. In an air brush having a nozzle and a handle through which compressed air is supplied to the nozzle, under control of a valve; a hand grip conformable to the palm of the hand pivoted on the handle and adapted to act upon the valve to open it against air pressure, when the handle and the hand grip are gripped for that purpose.

2. In an air brush having a spray nozzle supplied with fluid under pressure, and a valve to control the supply mounted in a valve chamber; an equalizing chamber between the controlling valve and the spray nozzle, and said valve chamber opening directly into said equalizing chamber.

3. In an air brush having a handle and a spray nozzle supplied with fluid under pressure through said handle, and a valve to control the supply, a hand grip pivoted to

said handle at the inlet end of said handle; an equalizing chamber between the controlling valve and the spray nozzle, and means to pre-determine the maximum flow of fluid to the equalizing chamber.

4. In an air brush having a spray nozzle supplied with fluid under pressure, and a valve to control the supply mounted in a valve chamber; an equalizing chamber between the controlling valve and the spray nozzle, and adjustable means in said valve chamber to pre-determine the maximum flow of fluid to the equalizing chamber.

5. In an air brush having a spray nozzle, a handle through which compressed air is supplied to the spray nozzle and a valve to control the flow of air from the handle to the spray nozzle; a hand grip pivoted on the handle at the inlet end of said handle and adapted to act on said valve to open it against air pressure when the handle and the hand grip are gripped for that purpose; an ejector nozzle having a frusto-conical forward end and operable by flow of compressed air from the handle adjacent the outlet from the ejector nozzle; means to supply material to the bore of the ejector nozzle; and a spray nozzle arranged to receive the discharge from the ejector nozzle, and adjustable toward and from the ejector nozzle to decrease and increase the flow into the spray nozzle.

6. An air brush provided with an equalizing air chamber and with an ejector nozzle and also provided with an elongated spray nozzle having a bore through which the mixture is sprayed, said spray nozzle being adjustable toward and from the ejector nozzle to regulate the orifice through which the air is delivered from the equalizing chamber to the bore of the spray nozzle.

7. An air brush provided with an ejector nozzle and a spray nozzle into which said ejector nozzle discharges, and said air brush also being provided with material supplying means detachably attached to the discharge end of the ejector nozzle; and means to supply the same with material to be ejected.

8. In an air brush provided with a hollow handle forming an air passage, an air equalizing chamber which terminates at its forward end in an internally threaded nozzle connection and also in an ejector nozzle which terminates in a threaded tip connection; a valve chamber connecting said air passage and air chamber; a valve to control the connection between said passage and chamber; a nozzle tip threaded into said threaded tip connection; and a spray nozzle threaded into said threaded nozzle connection and having a bore adapted to receive said nozzle tip and terminating in a conical bore adapted to receive the ejector nozzle and form an air ejector orifice therebetween which opens from the air chamber; said spray nozzle be-

ing adapted to be adjusted to decrease and increase the air ejector orifice.

9. In an air brush provided with an ejector nozzle; a spray nozzle into which the ejector nozzle discharges and which is adjustable relative to the ejector nozzle, and adapted to predetermine the delivery of air to the spray nozzle.

10. An air brush comprising a main body constructed with an air hose connection and a valve grip lug at the inlet end of the handle, and also comprising a pressure equalizing air chamber and a valve chamber which connects the passage between the hollow handle and the pressure equalizing air chamber; said valve chamber being threaded; an externally threaded and centrally bored and tapped valve stop bushing; a valve in and extending through said valve chamber; a screw screwed through said bushing and adapted to limit the opening of the valve; and a valve grip pivotally connected to the grip lug and adapted to be grasped by the hand to operate said valve against the air pressure in said valve chamber.

11. In an air brush provided with an air chamber which terminates at its forward end in an internally threaded nozzle connection and also in an ejector nozzle that has a frusto-conical forward end; a spray nozzle opening from the air chamber around the end of the ejector nozzle and adapted to be adjusted to decrease and increase the outlet from the air chamber.

12. In an air brush an ejector nozzle provided with a supply pipe connection, an outlet channel which terminates in a threaded connection, and a nozzle tip screwed into said threaded connection; in combination with an air chamber; means to supply predetermined pressure of air to said air chamber, and a spray nozzle in adjustable relation to the ejector nozzle to predetermine the flow of air from the air chamber past the ejector nozzle.

13. In an air brush, the combination with an ejector nozzle of a spray nozzle between

which and the ejector nozzle there is provided an outlet around the ejector nozzle; said outlet being laterally extended by channels to give a fan shape to the spray issuing from the spray nozzle.

14. In an air brush, the combination with an ejector nozzle of a spray nozzle between which and the ejector nozzle there is provided an outlet around the ejector nozzle; said outlet being laterally extended by channels to give a fan shape to the spray issuing from the spray nozzle; said spray nozzle being adjustable to control the out-flow of air around the ejector nozzle.

15. In an air brush the combination with an ejector nozzle of a spray nozzle between which and the ejector nozzle there is provided an outlet around the ejector nozzle; said outlet being laterally extended by channels having forwardly converging walls adapted to give a fan shape to the spray issuing from the spray nozzle.

16. In an air brush the combination with an ejector nozzle of a spray nozzle between which and the ejector nozzle there is provided an outlet around the ejector nozzle; said outlet being laterally extended by channels having forwardly converging walls adapted to give a fan shape to the spray issuing from the spray nozzle; said spray nozzle being adjustable to control the outflow of air around the ejector nozzle.

17. In an air brush the combination with an ejector nozzle of a spray nozzle between which and the ejector nozzle there is provided an outlet around the ejector nozzle; said outlet being laterally extended by channels having forwardly converging walls adapted to give a fan shape to the spray issuing from the spray nozzle; said channels also having flat parallel walls.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 11th day of January, 1922.

PURLING ALLEN BLEAKLEY.

Witness:

JAMES R. TOWNSEND.