May 19, 1936. J. A. PAASCHE 2,041,482

AIR PAINTING DEVICE

Filed July 19, 1930

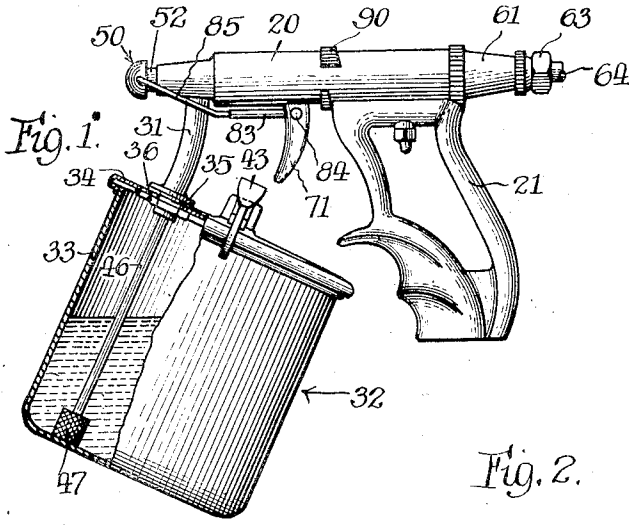


Fig. 1.

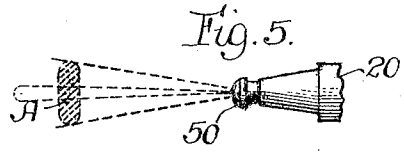


Fig. 5.

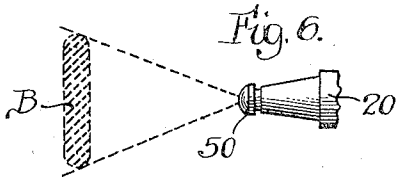


Fig. 6.

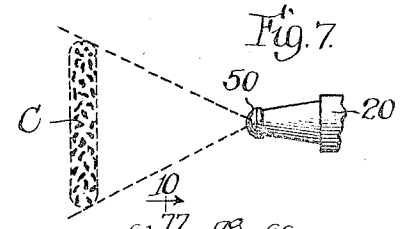


Fig. 7.

Fig. 2.

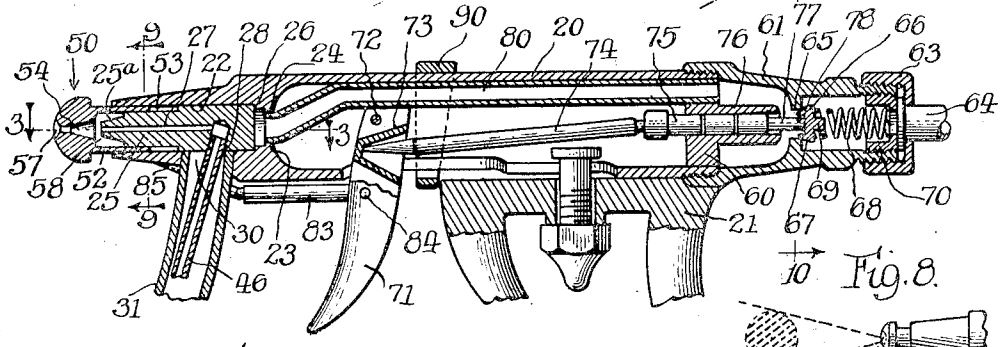


Fig. 3.

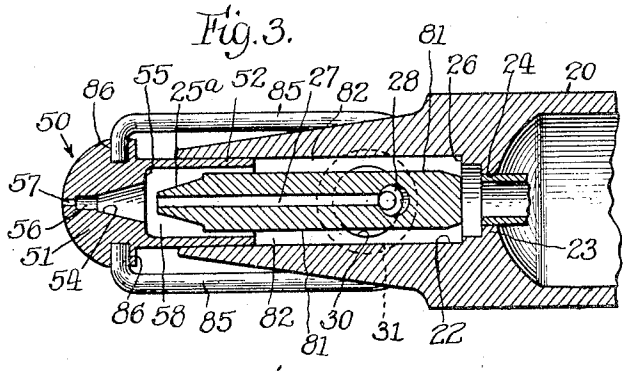


Fig. 4.

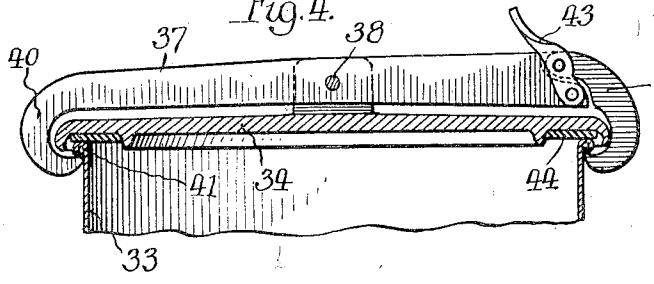


Fig. 8.

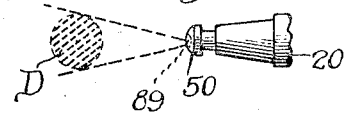


Fig. 9.

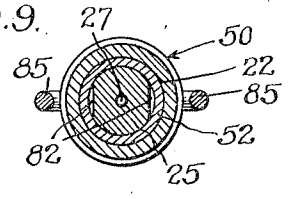
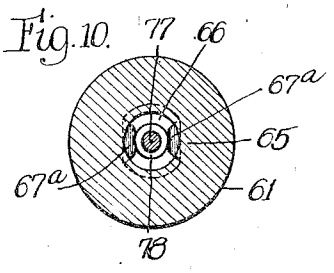


Fig. 10.



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Patented May 19, 1936

2,041,482

UNITED STATES PATENT OFFICE

2,041,482

AIR PAINTING DEVICE

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Application July 19, 1930, Serial No. 469,036

13 Claims. (Cl. 299—89)

The invention relates generally to air painting devices and more particularly has reference to devices of this nature adapted to be operated by air under pressure.

One of the objects of the invention is to provide a novel device of this character capable of being operated by air under comparatively low pressure.

Another object of the invention is to provide, in a device of this nature, a novel means for controlling the character of the spray stream delivered thereby.

In connection with the foregoing, another object of the invention is to provide a novel means for gradually varying the proportion of pressure fluid to liquid whereby to effect a change in the nature of the spray discharged from the device.

Another object resides in the provision of a novel control means by which the surface area covered by the spray, for any given distance between said surface and the device, may be readily varied by the operator.

The invention further contemplates the provision of a device in which a single manually actuated member controls the graduation of the spray between the limits of a fine mist-like spray and a heavy coarse spray, and at the same time proportionally alters the size of the spray to vary the surface area covered thereby.

Still another object of the invention resides in the provision of an improved means for controlling the flow of pressure fluid to the device.

A further object is to provide a novel control mechanism which embodies the combination of a valve for normally preventing most but not all of the flow of pressure fluid to the device and means for causing a back-pressure in said flow to prevent the flow of liquid to the device.

Another object of the invention is to provide a device in which the parts are so arranged that disassembly thereof may be easily accomplished to permit cleansing, replacement, or inspection of the parts.

A further object resides in the provision of a novel container for the fluid to be sprayed including a simple means for preventing the entrance of foreign matter into the fluid line.

In the drawing:

Figure 1 is a side elevation on a reduced scale of a device embodying the invention.

Fig. 2 is a fragmentary vertical section taken centrally and longitudinally of the device.

Fig. 3 is a horizontal section on an enlarged scale of the front end of the device taken substantially on the lines 3—3 of Fig. 2.

Fig. 4 is a detail section of the top of the liquid supply reservoir.

Figs. 5, 6 and 7 respectively are diagrammatic views showing successive operative results produced by variable actuation of the control means.

Fig. 8 is a view similar to Fig. 5 showing another type of spray.

Fig. 9 is a transverse section through the front end of the device as indicated by the line 9—9 of Fig. 2.

Fig. 10 is a transverse section through the control valve taken substantially on the line 10—10 of Fig. 2.

In its broad aspect, the invention contemplates an organization adapted to be connected to and operated by a source of pressure-fluid under low pressure. A portion of said pressure-fluid is utilized to feed the liquid to be atomized or vaporized to a mixing chamber wherein it is broken up by the pressure fluid. Control means, associated with the mixing chamber, is arranged to vary the proportion of pressure fluid to liquid over a wide range so that the character of the resulting spray produced may be likewise varied. This variation of character ranges gradually from a very finely atomized spray to a heavy coarse spray, thus producing a device capable of performing many different types of work.

The same control means is further adapted to alter the dimensions of the spray whereby to vary the surface area covered thereby. The range in this case is from a small area when the fine spray is produced to a large area when the coarse spray is discharged. A single manually actuated operating member governs the entire manipulation of the device including the admission of air, the flow of liquid, and the actuation of the control means.

For purposes of disclosure, the present embodiment of the invention is shown as being particularly adapted for atomizing paint or other coating material by air under low pressure. It is recognized, however, that the device is capable of vaporizing liquids, other than paint, by pressure fluids, other than air, and it is contemplated that all such modified uses will fall within the spirit and scope of the appended claims.

In the embodiment of the invention which has been selected for the purpose of illustration, the body of the spraying device comprises a barrel 20 having secured thereto a handle 21 which may be of the pistol-grip type. The forward end of the barrel, which is the left-hand end of the de-

vice as illustrated, tapers gently toward the axis of the barrel. Within this tapering portion is an axially extending bore 22 (Figs. 2, 3 and 9) which is cylindrical in shape and terminates at an inwardly extending shoulder 23. Preferably, the shoulder 23 is formed as a part of the barrel and is annular to define a port 24 at the rear end of the bore through which pressure fluid is delivered as will be presently described.

A nozzle member 25, from which the liquid to be atomized is discharged, is adapted to be received and supported in the bore 22. As shown, the liquid nozzle member comprises an elongated, substantially cylindrical plug fashioned to fit snugly into said bore. A stop shoulder 26 (Figs. 2 and 3) within the bore engages the inner end of said member to space it a short distance from the annular shoulder 23. The outer end of the member tapers gently as indicated at 25a, to a relatively blunt point, which projects slightly beyond the front end of the barrel 20. The nozzle member is provided with an axial bore 27 extending from the tapered end to a point within the member. At its inner end, the bore communicates with a laterally opening port 28.

While the fluid or liquid to be atomized and sprayed may be delivered to the bore 27 in many ways, the illustrated organization is especially suitable for a device by which color or paint is applied. The lower side of the barrel 20, near the rear end of the tapered portion, is provided with an aperture 30 of substantial size which communicates with the bore 22 in the barrel. A tubular conduit 31 is rigidly secured at one end to the barrel and connects the aperture 30 with a source of liquid.

The source of liquid, in this instance, is a closed, air-tight receptacle indicated generally at 32 (Fig. 1) comprising a cup-shaped lower section 33 (Fig. 4) and a cover element 34. For convenience, the cover element 34 is mounted rigidly on the conduit 31 in any suitable manner as by providing a shoulder 35 (Fig. 1) on the conduit against which the cover is held in air-tight relation by a nut 36 screw threaded on the end of the conduit. The lower section 33 is arranged to be detachably secured to the cover element by means of a quickly releasable clamping device. This device comprises an elongated lever 37 (Fig. 4) pivotally mounted, as at 38, on the cover, which lever at one end is formed as a hook 40 arranged to extend around the edge of the cover element 34 into engagement with an outwardly projecting head 41 on the lower section 33. The lever 37 carries a second hook 42 adapted to engage the head 41 on the opposite side of the lower section. The hooks are actuated by an eccentrically pivoted finger piece 43 so interposed between the lever 37 and the hook 42 that a force may be exerted on the hooks 40 and 42 to draw the cover element and the lower section of the receptacle tightly together. A gasket 44, carried by the cover element, is provided to insure an air-tight seal between the sections of the receptacle.

The liquid in the receptacle is conducted to the liquid nozzle member 25 by a tube 46 communicating with the port 28 in said member. Preferably, the tube is screw-threaded into the member to facilitate disassembly for cleansing purposes. The tube extends from the member through the aperture 30 in the barrel and into the receptacle 32 through the conduit 31. The tube, as may be seen in Fig. 2 is of substantially less diameter than the conduit and is substantially straight. The conduit, however, curves slightly forward so that when assembled the tube will engage opposite sides of the conduit. This relationship holds the tube rigidly within the conduit and further serves to prevent movement of the liquid nozzle member relative to the barrel.

The lower end of the tube terminates near the bottom of the receptacle and is enclosed by a coaxially arranged, cylindrically-shaped foraminous member 47 (Fig. 1). The foraminous member serves as a strainer to prevent the entrance of foreign matter to the tube. The cylindrical shape of the member is advantageous in that in use the member is vertical and any foreign matter will tend to settle to the bottom of the receptacle thus allowing an uninterrupted flow of liquid through the upper part of the member to the tube.

Referring particularly to Figs. 2 and 3, 50 indicates generally a spray nozzle from which the atomized spray is discharged. The spray nozzle comprises a head portion 51 rounded on one side and provided with an axially extending tubular shell 52 projecting from the opposite side thereof. The outer diameter of the shell is slightly less than the inner diameter of the bore 22 so that the shell may extend snugly and slidably into the bore. The front end of the liquid nozzle member 25 is recessed or annularly grooved, as at 53 (Fig. 2), to a depth approximately equal to the thickness of the shell to permit sliding movement of the shell between the front end of the liquid nozzle member 25 and the barrel 20 (see Fig. 9).

The head portion 51 has an axial discharge orifice or aperture extending therethrough, which has a particular formation in this embodiment for the purpose of controlling the finely atomized spray discharged therefrom. Thus, that portion of the orifice which communicates with the interior of the shell flares inwardly, as at 54 (Fig. 3), to form the complement of the tapered point 25a of the liquid nozzle member 25. The largest diameter of the flared portion of the orifice is less than the inner diameter of the shell, thus providing an annular shoulder 55 between the orifice and the shell interior. The front end of the flared portion communicates with a short bore 56 of constant diameter which extends nearly through the head where it meets a narrow slot-like kerf 57 formed in the front face of the head.

The interior of the shell 52, the flaring portion 54 in the head, and the front surface 25a of the liquid nozzle member 25, define therebetween a mixing chamber or compartment, designated 58, in which, since the spray nozzle 50 is movable relative to the liquid nozzle member 25, the relative positions of the parts may be varied to perfectly control the flow of liquid to the discharge orifice.

The pressure fluid by which the liquid is vaporized as it issues from the liquid nozzle member 25, is admitted to the device in the following manner: The rear end of the barrel 20 is closed by means of a plug 60 (Fig. 2) soldered or otherwise rigidly secured to the barrel. Externally, the end of the barrel is screw-threaded to receive a hollow cap 61 which is somewhat elongated and is, in turn, externally screw-threaded to receive a gland 63. A flexible conduit 64 of any well-known construction is carried by the gland to connect the interior of the cap with a source of pressure fluid (not shown).

The passage of pressure fluid through the cap 61 is controlled by a valve mechanism. To this end, the cap intermediate the ends thereof is provided with an inwardly extending, annular shoulder 65 fashioned to form a valve seat. A valve member 66 having a tapered outer surface 67, is normally urged into engagement with the valve seat by a spring 68 which is seated on the valve member about a small boss 69 formed integrally with said member. The other end of the spring bears against a hollow plug 70 screw-threaded into the outer end of the cap 61.

The means for actuating the valve manually comprises a trigger element 71, pivotally mounted as at 72, within the barrel. The trigger extends from the barrel in front of the handle 21 in such manner that it may be readily manipulated by the index finger of the operator. Within the barrel, the trigger carries a U-shaped member 73 arranged to form a rearwardly opening pocket. A longitudinally extending link 74 has one end seated in the pocket, and the other end is connected for universal movement to an elongated pin 75. The plug 60 is axially bored to provide a sliding bearing for the pin and preferably has an elongated boss 76 formed integrally therewith to provide a greater bearing surface for the pin.

The free end 77 of the pin is of reduced diameter and extends through the valve opening formed by the annular shoulder 65 into an axial recess 78 in the valve member 66. This arrangement is advantageous in that there is no positive connection between the valve and the actuating means thereby permitting the valve member to adjust itself freely to the seat when released by the pin 75.

Pressure fluid is conveyed through the barrel by a conduit 80 secured at one end in an aperture in the plug 60 and at the other end in the aperture 24 formed by the annular shoulder 23. From this point, the pressure fluid is conducted to the mixing chamber 58 and at the same time a portion thereof is diverted or by-passed to the upper part of the receptacle 32 to produce a feeding of the liquid under pressure.

A simple and effective manner of accomplishing this result is by providing one or more passageways between the front and rear ends of the liquid nozzle member 25, which passageways communicate with the conduit 31 leading to the receptacle. For this purpose, opposed transverse sides of the liquid nozzle member 25 are flattened, as at 81 (Fig. 3), by cutting away portions thereof. Passageways 82 are thus defined between the member 25 and the sides of the bore 22. The depth of the passageways is such that the passageways communicate with the aperture 30 in the barrel and, at the front end of the liquid nozzle member 25, permit the passage of pressure fluid past the portion of the shell 52 surrounding the member 25 to discharge into the mixing chamber 58.

In outlining the operation of the device, it should first be mentioned that the adjustment of position of the spray nozzle 50, relative to the liquid nozzle member 25, is effected by the trigger member 71. In the normal relation of parts, the shoulder 55 in the spray nozzle is spaced a short distance forwardly of the end of the liquid nozzle member 25. A link 83 (Figs. 1 and 2) is pivoted, as at 84, to the trigger member 71 and extends forwardly therefrom beneath the barrel. The front end of the link carries a yoke portion 85 arranged to straddle the conduit 31 and the front end of the barrel, and the ends of the yoke are bent toward each other to engage diametrically opposed sockets 86 formed in the head of the spray nozzle. Hence, manipulation of the trigger member to open the valve produces a simultaneous rearward movement of the spray nozzle 50 toward the liquid nozzle member 25 and the extreme limit of such rearward movement is determined by the engagement of the complementary tapered surfaces 54 and 25a.

The entire operation of the device is controlled solely by the manipulation of the trigger member 71. That is to say, the character of the spray which will be discharged from the device, as well as the area of the surface which will be covered by the spray for any given distance of the device from said surface, may be controlled by moving the trigger member through varying distances.

Considering that the device is in its normal position and is ready for use, it will first be presumed that the trigger is retracted a very short distance. This operation unseats the valve member 66 and allows pressure fluid to flow through the tube 80, passageways 82, and into the mixing chamber 58. At the same time, a part of the pressure fluid is diverted into the receptacle through the conduit 31 and applies pressure to the surface of the liquid therein. This initial movement of the trigger has caused the spray nozzle 50 to move slightly toward the liquid nozzle member 25 but such movement is not sufficient to carry the shoulder 55 in the spray nozzle past the discharge end of the liquid nozzle member. Consequently, a back pressure is built up in the mixing chamber which is ample to prevent the flow of any liquid from the receptacle. Obviously, since the discharge orifice from the spray nozzle is open a certain amount of pressure fluid escapes therefrom during this time and this escaping pressure fluid may, if desired, be utilized by the operator to cleanse or dust the surface to be sprayed.

Continued movement of the trigger member does not have any further effect upon the valve 66 since the valve is already open, but does produce a retraction of the spray nozzle toward the liquid nozzle member. This continued retraction gradually decreases the volume of the mixing chamber 58 and diminishes the amount of back pressure in the mixing chamber until the end of the liquid nozzle passes the shoulder 55 in the spray nozzle. At about this position of the parts, the back pressure has decreased to such a point that the pressure in the receptacle 32 causes a flow of liquid through the tube 46 and bore 27. This liquid is discharged into the tapered part 54 of the discharge orifice, where it is mixed with and atomized by the pressure fluid. Since the volume of pressure fluid at this time is relatively large, as compared to the volume of liquid atomized thereby, the resulting spray discharged by the device will be in the form of a very fine, smoke-like mist.

As the complementary tapered surfaces 25a and 54 are brought closer together, it will be apparent that the tapered space therebetween decreases in aggregate cross-sectional area and gradually restricts the amount of pressure fluid flowing therethrough. As a result, the back pressure of the pressure fluid decreases to effect the flow of an increasingly greater quantity of liquid. This variation of the proportions of pressure fluid and liquid alters the character of the discharged spay, in that the particles of liquid in the spray become heavier until a coarse spray, well adapted

for producing a rough or fine stipple effect, results.

If the liquid supplied possesses characteristics similar to those of rubber, the issuing material has a thread or string-like appearance of fine or coarse texture depending on the position of the spray nozzle.

The tendency toward an injector action, caused by the pressure-fluid passing the liquid nozzle member, probably does not materially effect the amount of liquid discharged. This may be due to the fact that the cross-sectional area of the most restricted part of the discharge orifice (which is the bore 56) is positioned in front of the end of the liquid nozzle member and is less than the effective area of the tapered pressure-fluid passageway leading thereto. Hence, there will be a greater or lesser amount of back pressure acting upon the liquid up to the point at which the aggregate cross sectional area of the tapered pressure-fluid passageway becomes equal to the cross-sectional area of said restricted part 56 of the orifice. Further restriction of this tapered passageway area will probably produce an injector action which will additionally increase the flow of liquid to some extent.

In the operation of the device which has just been described, it has been considered that the device was attached to a source of pressure fluid (not shown) which is in the nature of a pressure tank or similar well-known instrumentality embodying a safety valve or automatic pressure release. In such a case, the valve 66 may completely close the pressure fluid conduit. In certain uses of the present invention, however, it may be found desirable to connect the spraying device directly to an air compressor unit which is constantly running and which does not embody means for preventing the pressure behind the valve from building up. The present invention is arranged to prevent the accumulation or building-up of such excess pressure.

To this end, with particular reference to Fig. 10, the valve member 66 is fashioned to allow a leakage of air between the valve surface 67 and the valve seat 65 when the valve is in its normally closed position. One manner of accomplishing this is by slightly recessing opposed sides of the valve surface 67, as in indicated at 67^a. The escape of the pressure fluid through the valve prevents the accumulation of pressure fluid behind the valve, even though the air compressor unit, to which the device is attached, is constantly operating. Such escaping pressure fluid passes through the tube 80, passageways 82, and into the mixing chamber 58 where back pressure is created in the manner which has been previously described to prevent a flow of liquid to the mixing chamber. Obviously, the pressure fluid ultimately discharges from the device through the discharge orifice.

The variation of the size of the area covered by the spray is also a direct result of the manipulation of the trigger member. With reference to Figs. 5, 6 and 7, three consecutive positions of the spray nozzle 50 are shown. As the trigger is initially moved a small jet of air is released as is shown in dotted outline centrally of the fan-shaped spray illustrated in Fig. 5. Further movement of the trigger moves the spray nozzle to the position at which the fine, mist-like spray is produced. In this position, the surface area effectively covered by the spray is relatively small as indicated at A. In Fig. 6, an intermediate position of the spray nozzle is shown in which the spray stream is heavier and a larger surface area B is effectively covered. In Fig. 7, the spray nozzle is completely retracted to produce the heaviest spray and to effectively cover a maximum of surface area, as shown at C.

Figs. 5, 6 and 7 show the spray in the shape of a fan, which shape is produced by the narrow kerf 57. Obviously, sprays of different shapes may be produced by varying the form of the nozzle, as, for example, the conical stream D (Fig. 8) which is produced by providing a shallow arcuate recess 89 in the outer face of the spray nozzle.

The movable relationship of the spray nozzle and the liquid nozzle member, and the complementary tapered surfaces therein, constitutes the control means which permits the device to be operated at low pressure. This results from the provision of what may be termed a force feed for the liquid and a control of the volume of liquid fed by the creation of back pressure or resistance to flow which is variable.

Preferably, means are provided for adjusting the device to produce a spray of constant character. In the present instance, this is accomplished by adjustably limiting the extent of retraction of the trigger member. Thus, a split taper sleeve 90 (Figs. 1 and 2) encircles the barrel 20 intermediate the handle 21 and the trigger member 71. The sleeve is of graduated width and is rotatable on the barrel to interpose portions of various widths in the path of retraction of the trigger. This arrangement enables the operator accurately to limit the extent of movement of the trigger member, and if desired, positively to lock the trigger against accidental movement.

From the foregoing, it will be aparent that a spraying device has been provided which is exceedingly simple in operation and by which an operator can produce a spray suitable for substantially any kind of work. Moreover, the device is simple in its constructional details and may be readily taken apart for cleansing purposes or for replacement of parts.

I claim as my invention:

1. A spraying device comprising, in combination, a barrel having an axial recess at one end, a source of pressure fluid connected to said recess, a valve controlling the passage of fluid to said recess, a nozzle element fitted in said recess, said element having an axial bore extending inwardly from the outer end thereof, a conduit connecting said bore and a closed liquid receptacle, means providing longitudinal passageways for pressure fluid between said element and the walls of said recess, a pressure conduit connecting said passageways and said receptacle, a spray nozzle having a discharge orifice therein mounted on said nozzle element for movement toward and away from the outer end of said bore, said spray nozzle being internally recessed to provide a pressure fluid and liquid mixing chamber, and a single manually operated means for controlling said valve and varying the position of said spray nozzle.

2. A spraying device comprising, in combination, a barrel having a liquid discharge nozzle at one end, a source of liquid connected to said nozzle, an apertured member enclosing said nozzle in spaced relation thereto to provide a mixing chamber therebetween, adjusting means for moving said member and said nozzle relatively, a source of pressure fluid, a conduit connecting said source of pressure fluid with said mixing chamber, a by-pass conduit interposed between

said source of liquid and said pressure fluid conduit, a valve controlling the passage of pressure fluid through said pressure fluid conduit and said by-pass conduit, and actuating means connected to said valve and to said apertured member for simultaneously actuating said valve and said adjusting means.

3. In a spraying device, the combination of a barrel having a recess at one end, a nozzle element in said recess, a conduit secured to said barrel and communicating with said recess, a liquid reservoir connected to said conduit, said nozzle element having a bore therein, and a liquid conduit connected to said bore and extending from said barrel through said first mentioned conduit.

4. In a spraying device, the combinatio of a barrel having a liquid nozzle loosely mounted in one end thereof, a source of fluid, a conduit connecting said source to said nozzle, and means engaged by said conduit to prevent movement of said nozzle relative to said barrel.

5. In a spraying device, the combination of a barrel having a discharge nozzle loosely mounted in one end thereof, an elongated conduit having a screw threaded connection with said nozzle, said barrel having an aperture therein through which said conduit extends and which said conduit engages to hold said nozzle in said barrel.

6. In a spraying device, the combination of an adjustable spray discharging member having a hollow chamber therein, means for introducing liquid under pressure to said chamber, means for introducing pressure fluid to said chamber, said member having control means therein operable to create an internal pressure within said chamber for resisting the flow of liquid, the amount of said internal pressure so created being dependent directly upon the position of adjustment of said discharging member, and a single manipulable means for controlling the introduction of pressure fluid and the adjustment of said discharging member.

7. A spraying device comprising, in combination, a barrel having an axial recess in one end, a nozzle having an outwardly opening axial bore therein loosely mounted in said recess, a conduit connecting said bore with a source of liquid and serving to secure said nozzle in operative position, and a pressure-fluid conduit communicating with said recess in said barrel, said barrel and said nozzle having clearance therebetween to provide a passageway for pressure fluid.

8. A spraying device comprising, in combination, a barrel having an axial recess in one end, a nozzle having an outwardly opening axial bore therein detachably mounted in said recess, a conduit connecting said bore with a source of liquid, a pressure-fluid conduit communicating with said recess in said barrel, said nozzle being longitudinally cut away on opposite sides to form passageways for pressure fluid from said pressure-fluid conduit through the recessed part of said barrel, and a pressure-fluid by-pass communicating with said cut-away passageway and connected with the source of liquid.

9. In a spraying device, the combination of a spray nozzle, means for delivering pressure fluid to said nozzle, a valve controlling the flow of pressure fluid, a permanently open conduit for delivering material to be sprayed to said nozzle, means for effecting a flow of material through said conduit under pressure, adjustable means for controlling the flow of material by opposed fluid pressure, and a single manually operated instrumentality for actuating said valve and manipulating said adjustable means.

10. In a spraying device, the combination of a substantially cylindrical liquid nozzle member, an apertured spray nozzle member having a tubular portion slidable over the end of said liquid nozzle member, a pressure fluid source connected with the device, control means for governing the pressure fluid flow, means providing a pressure fluid passageway discharging between said two nozzle members, and manually operable means responsive to the operator's manipulations for actuating said controlling means and adapted for slidably moving said two members axially with respect to each other when said controlling means is in position to permit pressure fluid flow, said nozzle members having a complementary interfitting relationship operable to vary the pressure exerted therebetween by the pressure fluid.

11. In a device of the character described, relatively movable spray and liquid nozzle members, a pressure fluid passage communicating with said spray nozzle, a valve for controlling the flow of pressure fluid through said passage, a source of liquid connected with said liquid nozzle member, means providing a chamber about the end of said liquid nozzle member and communicating with said pressure fluid passage, means providing communication between said pressure fluid passage and said source of liquid for conveying to said source pressure fluid under substantially the same pressure as in said chamber, and control means for opening said valve and for relatively moving said nozzle members, said control means being arranged to open said valve before moving said nozzle members, whereby fluid pressure is developed in said chamber and upon said liquid before said nozzle members are relatively moved.

12. In a device of the character described, relatively movable spray and liquid nozzle members, a pressure fluid passage communicating with said spray nozzle, a valve for controlling the flow of pressure fluid through said passage, means providing a chamber about the end of said liquid nozzle member and communicating with said pressure fluid passage, means for delivering liquid to said liquid nozzle member under substantially the same pressure as the pressure in said chamber, and common movable control means for opening said valve and for relatively moving said spray nozzle, said control means being arranged to open said valve fully during initial movement and being adapted to maintain said valve open continuously while being moved through minute degrees to relatively move said nozzle members.

13. In a spraying device including a body movable to direct he device toward a surface to be sprayed, cooperative spray head and nozzle members mounted for relative axial movement, pressure fluid and spray material sources communicating with said head and nozzle, a pressure responsive actuating member connected with said head and adapted for moving the same from an initial position toward said nozzle for varying the character of spray issuing from said head, and means adjustable to limit operation of said actuating member to halt said head at a limit position for producing a spray of constant character while permitting spray of variable character by actuation of said head through the interval between initial and limit positions.

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