

Feb. 23, 1954

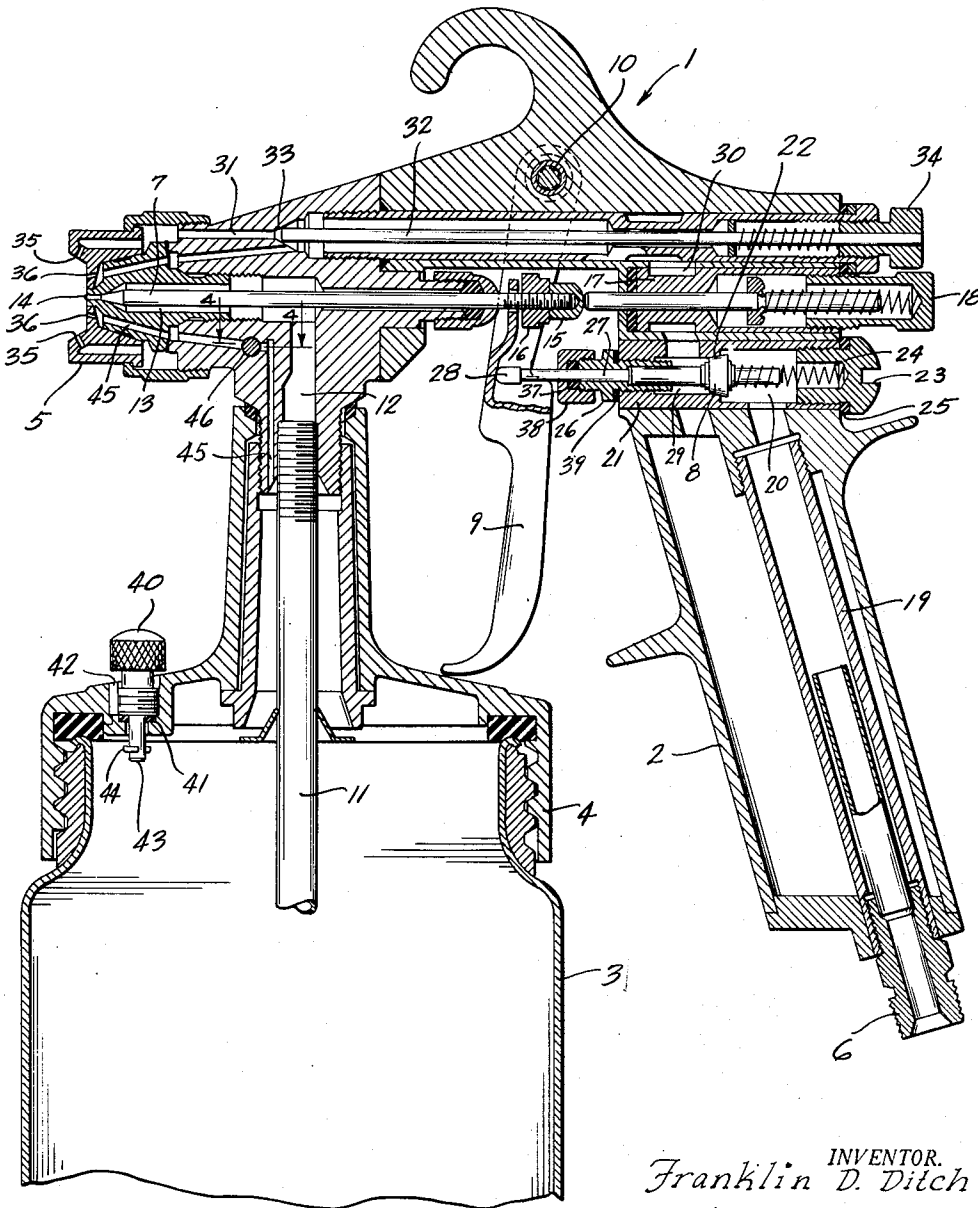
F. D. DITCH
DUAL PURPOSE SPRAY GUN

2,670,239

Filed June 5, 1950

2 Sheets-Sheet 1

Fig. 1



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Fig. 2

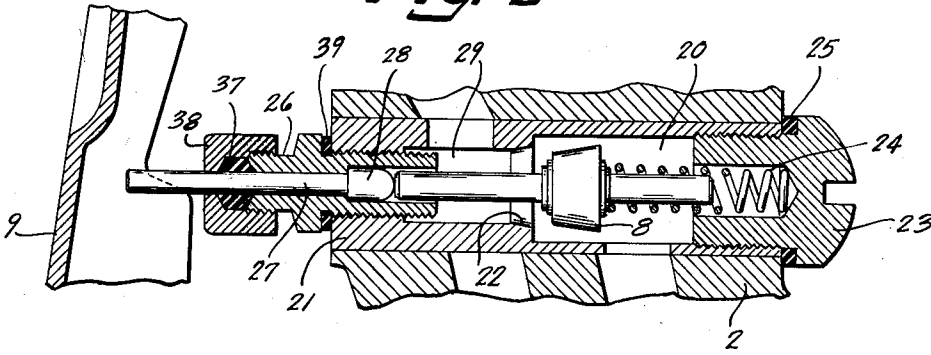


Fig. 3

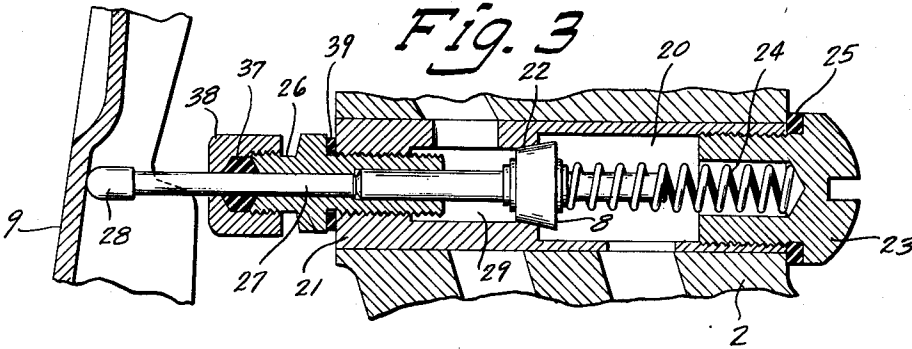
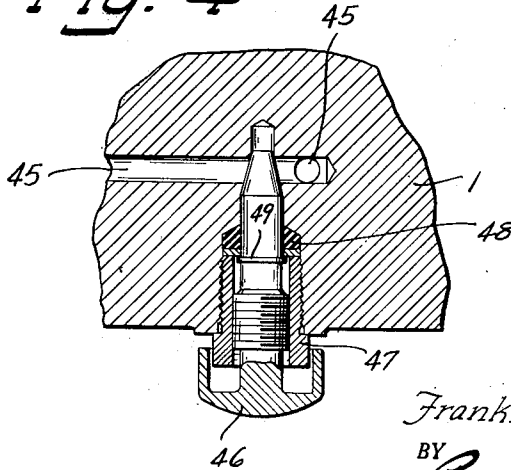


Fig. 4



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DUAL PURPOSE SPRAY GUN

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Application June 5, 1950, Serial No. 166,093

7 Claims. (Cl. 299—86)

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This invention relates to dual purpose spray guns and more particularly to spray guns adaptable to use with various types of air supply sources and with painting materials of widely differing viscosity.

An object of this invention is to provide a paint spray gun capable of interchangeable use with air supply means having self-contained pressure regulation, where positive shut-off air control is preferred, as well as with pressure means lacking independent pressure regulation whereby it is desired that "bleeder" control be present in the gun itself to prevent excessive pressure build-up.

Another object of the invention is to provide a spray gun having an interchangeable positive shut-off and "bleeder" type air control whereby the conversion between the control methods can be readily made by simple adjustment of a single valve assembly and without employing additional attachment elements.

A further object is to provide in a spray gun alternative siphon and pressure paint feeding means, whereby painting materials of widely differing viscosity may be readily used in the same gun.

These and other objects and advantages will be more fully set forth in the following description of a preferred embodiment of the invention as illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a side elevation of the spray gun with portions thereof broken away and sectioned. The gun is shown with its trigger released and the air supply valve assembly mounted to provide a positive shut-off control;

Fig. 2 is an enlarged detail sectional view of the air supply valve assembly when converted to provide "bleeder" air control;

Fig. 3 is an enlarged detail sectional view of the valve assembly of Fig. 2 showing the elements mounted as in Fig. 1 to provide positive shut-off control; and

Fig. 4 is an enlarged detail sectional view of the valve controlling the admission of compressed air to the paint container taken along the line 4—4 of Fig. 1.

The wide application of paint spray guns has made it desirable that they be capable of use with various types of compressed air supply sources. Among these are portable compressors having no independent pressure regulation. Such a compressor continuously forces air to the gun while attached thereto. As a result, it is necessary that the gun be provided with a bleeder means to permit free flow of air through and without the gun even during moments of gun idleness to prevent the building up of excessive pressure which would overload the compressor when pressure build-up exceeds that used by the gun.

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However, the same gun may be employed with an air line or a compressor having an air storage tank in which event it is desirable to positively shut off the supply of air when paint application is interrupted to thereby conserve the supply of air:

The gun illustrated comprises a body 1 having a handle grip 2, a painting material container 3 and its container cover 4, and a discharge nozzle 5. The cover 4 is removably secured to both the container 3 and the gun body 1, as described in a copending application, Serial Number 148,930, filed March 10, 1950 and now issued to Patent No. 2,610,091 by the assignee of the present invention.

As shown in Fig. 1, the portions of gun body 1 to which the cover 4 is secured, comprises a separable and readily removable spray head. However, it may be found advantageous to cast the spray head integral with other portions of body 1.

Air is supplied to the gun from a source, not shown, by suitable connection with an air hose connection assembly 6 disposed in the bottom of handle grip 2.

The gun body 1 contains a fluid needle 7 controlling the passage of painting material from the container 3 to nozzle 5, and an air supply valve 8 regulating the flow of compressed air from air hose connection assembly 6 to nozzle 5.

Needle 7 and valve 8 normally are both actuated by a trigger 9 pivoted to gun body 1 about a screw 10 and depending to between handle grip 2 and paint container 3.

Paint is drawn from container 3 through a dip tube 11 extending upwardly through the neck of container cover 4 and communicating with a vertical passageway 12 provided in gun body 1. Vertical passageway 12 connects with paint valve chamber 13. Chamber 13 extends forwardly to a paint orifice 14 formed at the front of nozzle 5.

The forward end of chamber 13 is frusto-conical in shape to seat the tip of fluid needle 7.

Fluid needle 7 is reciprocally mounted in body 1 and extends rearwardly of paint chamber 13 to without gun body 1. The rearmost portion of needle 7 is threaded to receive a retaining cap 15 and a needle adjusting screw 16. The trigger 9 is apertured to receive the needle 7 forwardly of the screw 16. Screw 16 may be adjusted to determine the amount of lost motion the trigger 9 will make before it engages screw 16 to unseat needle 7 thereby admitting and discharging paint through dip tube 11, passage 12, chamber 13 and orifice 14.

Needle 7 is normally biased forwardly by a spring-pressed paint volume control assembly 17 disposed within body 1 above handle grip 2. Biasing pressure may be varied by the positioning of an adjustment screw 18 threaded to with-

in assembly 17 and extending to the rear of the gun.

Compressed air entering air hose assembly 6 at the bottom of handle grip 2 travels upwardly through an air tube 19 threaded within the grip to a chamber 20 provided behind air supply valve 8.

Valve 8 is disposed within a sleeve 21 carried by the gun body 1. Sleeve 21 is formed with an annular shoulder 22 to seat the valve 8. A sealing cap 23 is threaded within the rear of sleeve 21 against which a needle spring 24 acts to normally bias the valve 8 to a closed position against shoulder 22. Cap 23 is sealed against sleeve 21 by ring 25.

The forward end of sleeve 21 is threaded to receive a bushing 26 which is apertured to carry needle stem 27 in coaxial alignment with valve 8.

Needle stem 27 has an enlarged end 28 which, when disposed as shown in Figs. 1 and 3, abuts against trigger 9. When trigger 9 is pulled toward the handle, stem 27 unseats valve 8 to permit the flow of air past the valve to within a chamber 29 disposed forwardly thereof. The enlarged end 28 also acts to limit the rearward movement of stem 27 in that it is formed with a greater diameter than would permit its passage through the apertures of bushing 26 and its associated elements.

Air admitted to chamber 29 is free to pass through an annular port 30 around paint volume control assembly 17 to within a longitudinally extending air passage within the barrel portion of the gun. A passageway 31 extends forwardly from the barrel passage to communicate with discharge nozzle 5.

The flow of air through passageway 31 is further controlled by a pattern-control needle valve 32 disposed to seat against a conical orifice 33 formed at the rear end of passageway 31. The rear end of valve 32 is received within a pattern adjusting screw 34. Screw 34 is adjustable within a threaded support to position valve 32 with respect to its orifice 33.

During operation of the gun needle valve 32 normally is maintained in an opened position and air admitted by supply valve 8 is discharged through a plurality of air passages 35 and 36 surrounding orifice 14 in nozzle 5 while the trigger 9 is in a squeezed position.

Passages 36 by-pass pattern control valve 32 and admit air to nozzle 5 through passageway 31 and passages 35 be closed off by valve 32 to vary the spray pattern when an external mix-type nozzle, such as nozzle 5, is employed with the gun.

With the arrangement of needle stem 27, shown in Figs. 1 and 3, release of trigger 9 would result in positive shut-off of air flow due to the biasing action of spring 24 against valve 8.

To adapt the gun to use with portable compressors and other air supply means having no independent pressure control, stem 27 may be reversed, as shown in Fig. 2, whereby the enlarged end 28 of the stem 27, unable to pass through the apertured neck of bushing 26, retains the valve 8 in its open position regardless of the release of trigger 9. The gun is thus given bleeder characteristics by adapting but a single valve assembly and without the necessary addition or elimination of any members thereof.

Bushing 26 which receives the needle stem 27 is made airtight by packing ring 37 held against the outer end of the bushing by a packing nut

38 externally threaded to bushing 26. A second ring 39 seals the joint between sleeve 21 and bushing 26.

To reverse stem 27 it is only necessary to unthread the bushing 26 (while still joined to the cap 38) from the sleeve 21 and reverse the tip therein, and then rethread the bushing into sleeve 21, as shown in Fig. 2.

When the trigger 9 is in a squeezed position thereby unseating paint needle 7, the flow of compressed air through discharge nozzle 5 creates a suction at orifice 14 adjacent the mouth of the nozzle which aids in the withdrawal of paint. However, it is normally necessary to admit either atmospheric or compressed air to the container 3 to effect either a siphon or pressure feed of the paint.

It is further desirable that the valves regulating the admission of atmospheric or compressed air to the paint container be capable of rapid and exact adjustment so that the feed of paint can be promptly regulated without the necessity of shutting down the gun.

As shown in Fig. 1, the cover 4 of paint container 3 is provided with a screw valve 40. Valve 40 is threaded to the cover 4 and seats upon a sealing ring 41. When valve 40 is unseated, air is admitted from the atmosphere to container 3 through a vertical port 42 formed to one side of the valve. A valve stem 43 depending from screw valve 40 to within container 3 carries a cotter pin 44 which abuts against the underside of cover 4 to prevent the valve 40 from being completely withdrawn from the cover whereby it might be misplaced or damaged.

When highly viscous material is present in container 3 it is desirable that compressed air replace atmospheric air in forcing the material upwardly through dip tube 11. For this purpose there is provided a passage 45 which communicates with the main supply of compressed air and extends rearwardly as an extension of one of the outlet passages 36. Passage 45 turns downwardly extending through the depending portion of body 1 which receives container cover 4 and opens into the neck of cover 4 adjacent the dip tube 11.

The flow of air through passage 45 is controlled by a valve screw 46 which extends laterally to within gun body 1 and is adjustably mounted to obstruct or open passage 45.

Referring to Fig. 4, valve 46 is threaded within a bushing 47 which is in turn secured to gun body 1. A sealing ring 48 disposed between the inner end of bushing 47 and the body 1 encircles the valve to prevent the escape of compressed air to the atmosphere. A snap ring 49 is mounted within a groove in the stem of valve 46 to engage a counter-bore in bushing 47 and prevent valve 46 from being completely withdrawn from the bushing.

When a pressure paint feed is desired, the valve 40 in container cover 4 is closed, rendering the container airtight, and the valve 45 is backed out as far as possible to admit compressed air through passage 45 to container 3. When only a siphon feed is desired, the valve 46 is closed and valve 40 is opened to admit atmospheric air to the container.

Various embodiments of the invention may be employed within the scope of the following claims. I claim:

1. A dual purpose spray gun comprising a paint supply valve, an air supply valve, an actuating means to operate said paint valve, and a

plunger-like member reversibly mounted between said air valve and actuating means to selectively control the air valve to either positively operate the same by reciprocal movement in response to said actuating means or upon reversal to retain it in open position regardless of the closure of the paint valve by the actuating means, thereby providing either positive shut-off or bleeder type air control.

2. A dual purpose spray gun comprising a paint supply valve, an air supply valve, an actuating means to operate said paint valve, a bushing disposed between said air valve and actuating means, and a plunger-like member having an enlarged end of a thickness greater than that of the bushing bore and reversibly mounted within said bushing to interchangeably control the air valve whereby the enlarged end is disposed either between said bushing and actuating means to permit reciprocal movement of the plunger to positively operate the air valve in response to said actuating means or is disposed between said bushing and air valve to space the latter in open position regardless of the closure of the paint valve by the actuating means.

3. A dual purpose spray gun comprising a gun body, a nozzle carried by said gun body, means for introducing compressed air to within said gun body, passages within the gun body to receive compressed air and direct it to said nozzle for discharge therefrom, a paint container communicating with said nozzle for the discharge of paint therefrom, a passage connecting said paint container with one of the first mentioned passages to divert compressed air to said paint container, a valve opening within said paint container to admit atmospheric air thereto and having control means operable independently of the introduction of compressed air into said gun body, and a second valve disposed within said last mentioned passage to control admission of compressed air to said container, said valves being adapted to be alternately opened to effect either siphon or pressure feed of the contents of said container.

4. A dual purpose spray gun comprising a paint supply container, a paint supply valve controlling the withdrawal of paint from said container, an air supply valve, an actuating means to operate said paint valve, means interposed between said air valve and actuating means to interchangeably control the air valve to either positively operate the same in response to said actuating means or retain it in open position regardless of the closure of the paint valve by the actuating means, and means associated with said paint container to optionally effect feed of its contents through the gun when said paint and air supply valves are open by utilizing pressure provided either by the atmosphere or by compressed air diverted to within the said container.

5. A dual purpose spray gun comprising a paint supply container, a paint supply valve controlling the withdrawal of paint from said container, an air supply valve, an actuating means to operate said paint valve, a bushing disposed between said air valve and actuating means, a plunger-like member having an enlarged end of a thickness greater than that of the bushing bore and reversibly mounted within said bushing to interchangeably control the air valve whereby the enlarged end is disposed either between said bushing and actuating means to permit reciprocal movement of the plunger to positively operate the air valve in response to said actuating means

or is disposed between said bushing and air valve to space the latter in open position regardless of the closure of the paint valve by the actuating means, and means associated with said paint container to optionally effect feed of its contents through the gun when said paint and air supply valves are open by utilizing pressure provided either by the atmosphere or by compressed air diverted to within the said container from said air supply valve.

6. A dual purpose spray gun comprising a gun body, a nozzle associated with said gun body, a paint container communicating with said nozzle for discharge of paint therefrom, a paint supply valve controlling withdrawal of paint from said container, means for introducing compressed air to within said gun body adapted to optionally positively shut off or continuously admit compressed air when said paint supply valve is closed, passages within the gun body to receive compressed air and direct it to said nozzle for discharge therefrom, a passage connecting said paint container with one of the first mentioned passages to divert compressed air to said paint container, a valve opening within said paint container to admit atmospheric air thereto, and a second valve disposed within said last mentioned passage to control admission of compressed air to said container, said valves being adapted to be alternately opened to effect either siphon or pressure feed of the contents of said container.

7. A dual purpose spray gun comprising a gun body, a nozzle associated with said gun body, a paint container communicating with said nozzle for discharge of paint therefrom, a paint supply valve controlling withdrawal of paint from said container, an air supply valve, an actuating means to operate said paint valve, a bushing disposed between said air valve and actuating means, a plunger-like member having an enlarged end of a thickness greater than that of the bushing bore and reversibly mounted within said bushing to interchangeably control the air valve whereby the enlarged end is disposed either between said bushing and actuating means to permit reciprocal movement of the plunger to positively operate the air valve in response to said actuating means or is disposed between said bushing and air valve to space the latter in open position regardless of the closure of the paint valve by the actuating means, passages within the gun body to receive compressed air and direct it to said nozzle for discharge therefrom, a passage connecting said paint container with one of the first mentioned passages to divert compressed air to said paint container, a valve opening within said paint container to admit atmospheric air thereto, and a second valve disposed within said last mentioned passage to control admission of compressed air to said container, said valves being adapted to be alternately opened to effect either siphon or pressure feed of the contents of said container.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,919,153	Andrews -----	July 18, 1933
2,027,103	Johnson et al. -----	Jan. 7, 1936
2,208,464	Logette et al. -----	July 16, 1940

FOREIGN PATENTS

Number	Country	Date
413,213	France -----	May 20, 1910