

[54] **SPRAY GUN WITH AUXILIARY SPRAY ATTACHMENT**

3,128,949 4/1964 Kaufman..... 239/312
 3,178,118 4/1965 New..... 239/304 X
 3,504,861 4/1970 Peeps et al..... 239/300

[75] Inventor: **Eldon L. Shreve**, Elmhurst, Ill.

[73] Assignee: **Binks Manufacturing Company**, Franklin Park, Ill.

[22] Filed: **May 17, 1974**

[21] Appl. No.: **470,967**

Primary Examiner—M. Henson Wood, Jr.
Assistant Examiner—Andres Kashnikow
Attorney, Agent, or Firm—Gary, Juettner, Pigott & Cullinan

[52] U.S. Cl. 239/307; 239/335; 239/337; 239/354; 239/369; 239/420

[51] Int. Cl.² B05B 7/32

[58] Field of Search 239/292, 294, 295, 300, 239/302-304, 306, 307, 310-314, 318, 335, 337, 339, 340, 341, 346, 354, 369, 375, 418, 420, 424

[57] **ABSTRACT**

A conventional air atomizing spray gun having a primary tip is provided with an auxiliary external spray nozzle directed in a converging path toward the outlet of the primary tip. The auxiliary spray tip is of the air atomizing, siphon type, and is connected via a conduit into an internal air supply passage of the spray gun at a location in the gun between the air supply valve and the primary spray tip. The air supply in the gun is used to operate both spray tips and to feed liquid into the siphon of the auxiliary tip. Liquid resin is fed to the primary spray tip, and a liquid catalyst is fed to the auxiliary spray tip, and the spray patterns of the two components converge and mix externally of the nozzles.

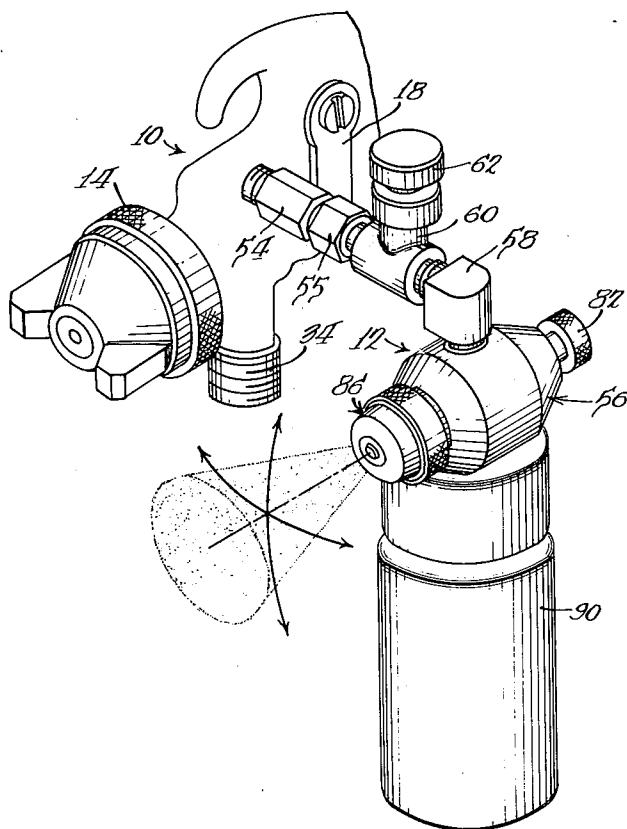
[56]

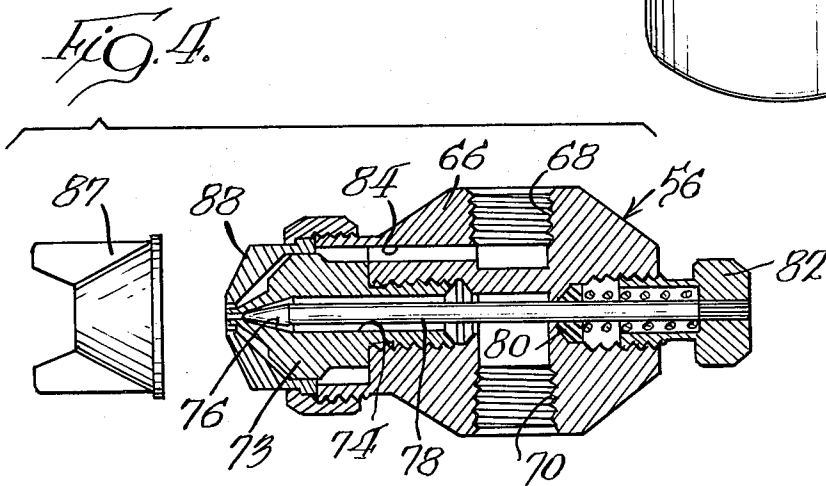
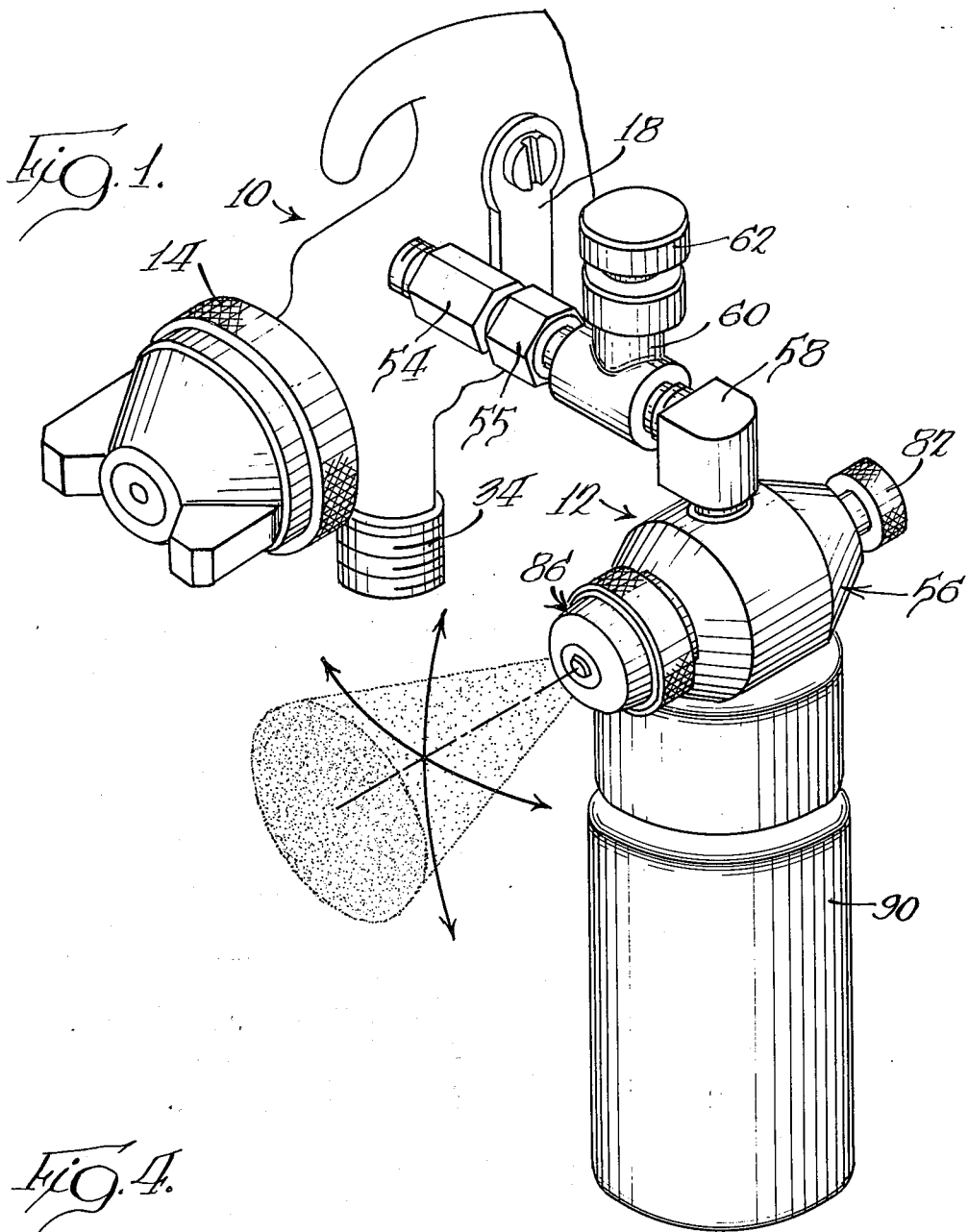
References Cited

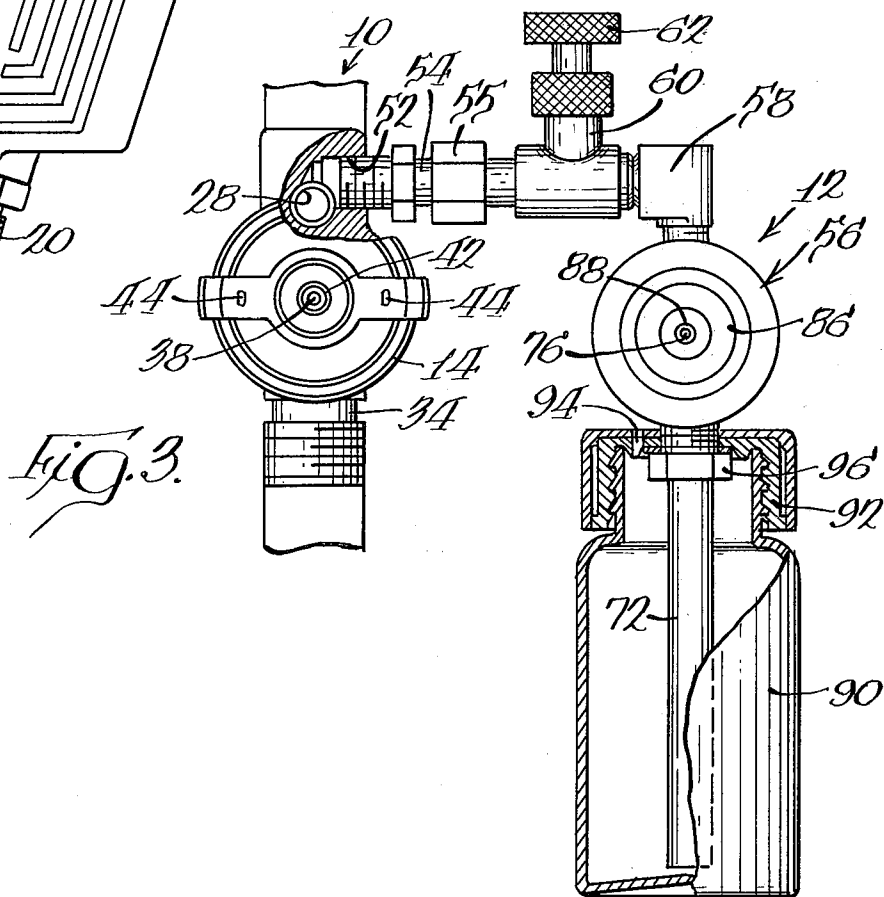
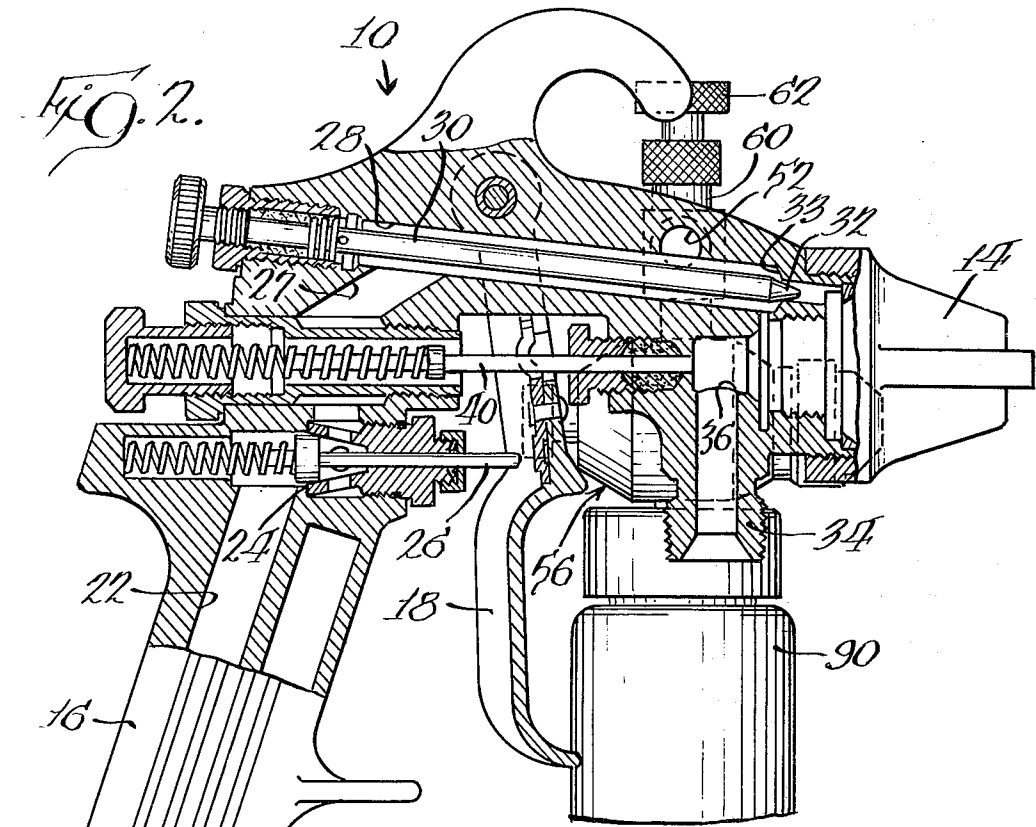
UNITED STATES PATENTS

1,752,923	4/1930	Mueller.....	239/292
2,281,666	5/1942	Bramsen et al.....	239/300
2,380,827	7/1945	Downs.....	239/434 X
2,559,544	7/1951	Paasche.....	239/300
2,995,173	8/1961	Nawalanic.....	239/420 X
3,033,472	5/1962	Shelton.....	239/306 X

4 Claims, 4 Drawing Figures







SPRAY GUN WITH AUXILIARY SPRAY ATTACHMENT

BACKGROUND OF THE INVENTION

Various spray devices have been proposed for spraying or other pressure application of catalyzed resin materials. The resin and catalyst are usually supplied as separate components and are mixed together shortly prior to application because of the short curing time or pot life of the mixture.

Various types of devices are commonly used to achieve mixing and spray application of two or more liquid components immediately prior to application. One type of device comprises a spray gun having two or more liquid passages leading to a single mixing chamber and spray nozzle, whereby mixing is achieved internally in the gun. This type of device must be cleaned immediately after use to prevent the internal passages from becoming clogged with cured resin.

Another type of device comprises a plurality of separate spray nozzles directed in a converging path. The nozzles are each separately supplied with air and with one of the components, and mixing of the components occurs externally in the converging spray patterns of the respective nozzles. This type of apparatus is more convenient to use because of the absence of clogging problems, but multiple spray devices are obviously more expensive and complicated than a single gun because of the additional parts involved in the separate spray systems and the additional parts necessary to achieve conjoint operation of the respective sprays.

In cases wherein only small portions of resin are to be applied, it is common practice to mix a small amount of the components together and apply the mixture with a single nozzle spray gun. Although this practice eliminates the need for more costly and elaborate apparatus, the gun must obviously be thoroughly cleaned after each use before the resin hardens, which greatly decreases the availability and productivity of the gun.

SUMMARY OF THE INVENTION

The present invention affords a solution to the problems mentioned above by providing a secondary spray attachment for a standard single component air spray gun. The secondary spray attachment is air operated and is connected to the internal air supply passage of the gun at a location between the air shut off valve and the nozzle. In this manner, the secondary spray is located externally of the spray gun but operated conjointly therewith. The secondary nozzle may be fed with catalyst by an integral air operated siphon disposed in a depending cup, and the spray gun nozzle may be supplied with liquid resin. The spray from the secondary nozzle is adjustably directed on a converging angle toward the spray pattern of the gun to achieve mixing of the two components externally of the gun.

The spray device of the present invention offers the advantages of a multiple spray system but with less complexity and fewer parts, since the trigger, air shut off valve, air pressure regulator and associated parts of the gun itself also simultaneously operate the secondary siphon spray. The air conduit between the gun and the auxiliary spray may be provided with an adjustable valve to regulate the amount of air supplied to the auxiliary spray and siphon and hence regulate the catalyst to resin ratio. Since the respective components are sup-

plied through separate passages, internal clogging problems are eliminated.

THE DRAWING

FIG. 1 is a perspective view of the auxiliary spray device of the present invention, shown in connection with a fragmentary view of a spray gun.

FIG. 2 is an elevational view, partly in vertical section, of a spray gun having an auxiliary spray device attached thereto in accordance with the present invention.

FIG. 3 is a fragmentary front end view of the device shown in FIGS. 1 and 2.

FIG. 4 is a side view, partly in section, of the spray tip assembly of the auxiliary spray device.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. 1, 2 and 3 illustrate the combination of a conventional air spray gun 10 and the auxiliary spray device 12 attached to the gun. The spray gun is conventional and will not be described in detail except to the extent required for a full understanding of the present invention. Reference may be made to one or more of the following patents, incorporated herein by reference, to obtain details of the structure and operation of spray guns of this nature: U.S. Pat. Nos. 1,717,086; 1,720,389; 1,751,787; 1,797,202; 1,950,779; 1,910,673; 2,004,303; 2,107,726 and 2,281,666.

The spray gun 10 generally comprises a body having a forward nozzle 14 and a depending rear handle 16, with a trigger 18 pivotally depending from the body in front of the handle. Air is supplied from a fitting 20 in the handle through an internal passage 22 leading to a shut-off valve 24 actuated by an operating rod 26 operably connected to the trigger 18. Air from the valve 24 leads through a connecting part 27 to an internal upper passage 28 in the gun body, said passage leading to the nozzle 14 or spray tip in a conventional manner. An externally adjustable threaded rod 30 is provided in the passage 28 and has a pointed end 32 engaging a valve seat 33 at the forward end of said passage, in order to adjustably regulate the amount of air supplied to the secondary air orifice 44 (FIG. 3) of the spray tip 14.

The gun is also provided with a valved liquid supply comprising a threaded inlet fitting 34 adapted for connection to a source of the desired liquid component. The liquid component may be supplied via a hose connected to inlet 34 or may be supplied via an attached pressurized or unpressurized container having a siphon. The inlet 34 communicates with an internal passageway 36 that leads to the outlet orifice 38 (FIG. 3) in the spray tip. A spring loaded rod 40 is slidably mounted in the gun body, is actuated by the trigger 18, and the forward end thereof engages a valve seat (not shown) in the vicinity of the spray tip 14, in order to regulate the amount of liquid supplied to the spray tip.

The spray tip is of the conventional atomizing type wherein pressurized air is forced out an annular orifice 42 (FIG. 3) disposed closely around the liquid outlet orifice 38 in order to atomize the liquid and propel the same away from the gun. The spray tip 14 may also be provided with an air cap having secondary air orifices 44 disposed on opposite sides of the liquid orifice in order to shape the spray into the form of the fan.

In normal operation, actuation of the trigger 18 opens both the air valve 24 and liquid valve, which al-

lows both air and liquid to be supplied simultaneously to the atomizing spray tip 14.

It will be understood that other types of air operated spray guns and spray tips may be employed, and the presently described gun should be considered as exemplary only. It is preferable, however, that the gun be of the type having conjointly operated air and liquid supplies and an internal air passage leading between the air valve and the spray tip, although the tip itself may be of any desired type.

In accordance with the present invention, an auxiliary air spray device, generally indicated at 12, is attached to the spray gun 10 and receives its air supply from an internal air passage of the spray gun 10. For this purpose, a threaded opening 52 is tapped into the gun body and into the upper air passageway 28, which extends internally within the gun between the trigger-operated air shut off valve 24 and spray tip 14, upstream of the valve seat 33. An air supply conduit or pipe 54 has a threaded end connected to the threaded opening 52, said pipe communicating with the air chamber of a secondary spray tip assembly 56 located in a spaced relationship and preferably to one side of gun spray tip 14.

As best shown in FIG. 3, the pipe 54 extends at right angles from the vertical longitudinal plane of the spray gun and has an L-shaped fitting 58 on its external end, which is threadably connected to and supports the secondary spray tip assembly 56. The pipe 54 is preferably composed of sections which include a swivel nut 55, and an adjustable air valve 60 having a manually adjustable knob 62.

The attachment of the secondary spray assembly 56 to the spray gun 10 as described above, allows for adjustment of the direction of the spray pattern of the secondary spray in both vertical and horizontal planes (shown by arrows in FIG. 1), such that said spray may be directed inwardly to intersect and merge with the spray from the gun 10. Angular adjustment in a vertical plane is enabled by the threaded connection between the captive hex nut 55, which provides for rotation of the secondary spray about the axis of the pipe 54. Angular adjustment in the horizontal plane is enabled by the threaded connection between the L-shaped fitting and the assembly 56.

As shown in FIG. 4, the secondary spray tip assembly 56 comprises a cylindrical body 66 having a threaded air inlet opening 68 connected to the L-shaped fitting 58 and a threaded liquid inlet opening 70 spaced 180° from the air inlet and connected by a hex member 96 to the threaded upper end of a siphon tube 72 (FIG. 3), with the axes of respective inlets being disposed in a vertical plane. The liquid inlet 70 communicates with a liquid nozzle 73 having a central bore 74 leading to a tapered confined outlet opening 76. The pointed end of a rod or needle 78 engages the tapered opening 76, extends through the bore 74 and is connected through suitable packing 80 to an external, spring loaded, threaded adjustment knob 82 which serves to adjustably move the needle toward and away from the tapered opening 76 and regulate the flow of liquid there-through.

The air inlet 68 communicates via a passageway 84 to an air nozzle 86 defining a tapered annular chamber and opening 88 around the liquid opening 76. Air supplied to nozzle 86 creates a zone of reduced pressure

at the liquid opening 76 and causes liquid to be drawn through the siphon tube 72.

As shown in FIGS. 1, 2 and 3, container 90 having a screw cap 92 with a vent 94 is disposed around the siphon tube 72 and secured thereto. A hex threaded member 96 which depends from and extends through the screw cap 92 is secured to the siphon tube 72, and the tube assembly extends from a position closely adjacent the bottom of the container 90, through the cap 92 and into the liquid inlet 70.

The operation of the composite device may now be clearly understood. As the trigger 18 is operated, air valve 24 is opened and supplies air to the upper passage 28 and the atomizing tip 14. At the same time, liquid control rod 40 is operated to allow flow of liquid to the liquid outlet orifice 38 from the inlet 34.

The flow of air through passage 28 is divided at the bleed-off outlet 52, and air is supplied via the pipe 54 to the secondary spray tip assembly 56, which causes liquid to be drawn out of the container 90 through siphon tube 72. Atomized liquid thus issues from the secondary spray tip assembly and intersects and merges with the spray issuing from the tip 14. The secondary spray tip is universally adjustable, as above described, to enable the spray pattern thereof to be pointed into the path of the other spray, whereby thorough mixing occurs and a composite spray pattern is formed. If desired, an air cap 87 may be provided on the secondary spray tip to impart a definite shape to the spray issuing therefrom.

It will be noted that the operation of the spray gun also serves to simultaneously operate the secondary spray tip without the necessity of providing the secondary tip with separate liquid and air shut off valves and associated parts. The secondary spray assembly is therefore operated as a slave to the spray gun, with the exception that the secondary air supply may be independently regulated by the air valve 62 and the rate of liquid flow may be independently regulated by liquid valve control 82. Although the secondary spray normally operates conjointly with the spray gun, it is possible to close the air valve 62 entirely and employ the spray gun as a single component gun.

An important feature of the present invention is the positioning of air opening 52 at a location between the shut-off valve 24 and the adjustable valve 32-33 of the spray gun 10. This feature allows for the air to the secondary spray assembly 56 to be regulated by the valve 60 independently of adjustments to the valve 32-33, and an adjustment to one valve will not have any significant effect on the adjustment of the other valve.

In the preferred embodiment of the invention, the gun liquid inlet 34 is supplied with liquid resin and the siphon container 90 is supplied with a catalyst for the resin or a catalyst and promoter, such catalyst being diluted to any desired degree. As the sprays of the respective components merge, the catalyst is thoroughly mixed with the resin, and the curing process takes place externally of the spray apparatus.

I claim:

1. A multi-component spray device comprising a spray gun comprising a spray nozzle, liquid passage means in said gun for supplying said spray nozzle with a first liquid component, an internal air passage in said gun communicating between said spray nozzle and an external fitting, liquid shut off valve means in said liquid passage, air shut off valve means in said internal air

5

passage, means for operating said liquid and air valve means conjointly, an opening in said spray gun in communication with said internal air passage at a location between said air valve means and said spray nozzle, an auxiliary spray device supported from said spray gun and comprising a body, a siphon air spray nozzle on said body, an air passage in said body communicating with said siphon nozzle, a conduit connecting said body air passage to the internal air passage of said gun through the opening therein, first adjustable valve means in said conduit, a liquid passage in said body communicating with said siphon nozzle, a downwardly depending siphon tube connected to said body liquid passage, and means for supplying a second liquid component to said siphon tube, whereby operation of said spray gun causes air to be supplied to said conduit to operate said auxiliary spray device.

6

2. The combination of claim 1 wherein said auxiliary air spray means comprises adjustable liquid valve means between said siphon tube and said siphon nozzle.

5 3. The device of claim 1 wherein second adjustable valve means are provided in said internal air passage for adjustably regulating air supplied to said spray nozzle, said opening in said air passage being located upstream from said second adjustable valve means, 10 whereby said first and second adjustable valve means may be adjusted independently of each other.

4. The device of claim 1 wherein said auxiliary spray device is supported from said spray gun by said conduit, said conduit including means to enable adjustment of the spray direction of said siphon air spray nozzle relative to the spray direction of said spray nozzle.

* * * * *

20

25

30

35

40

45

50

55

60

65