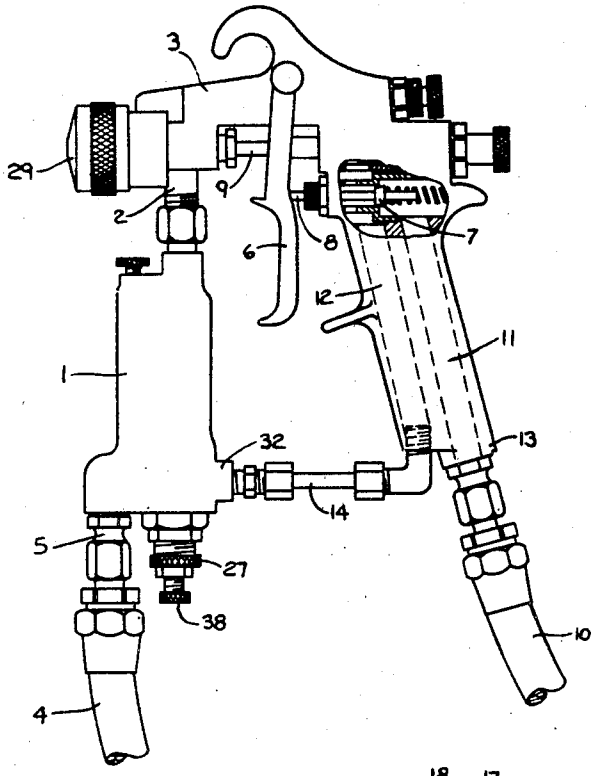
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MATERIAL DELIVERY DEVICE

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FIG. 1



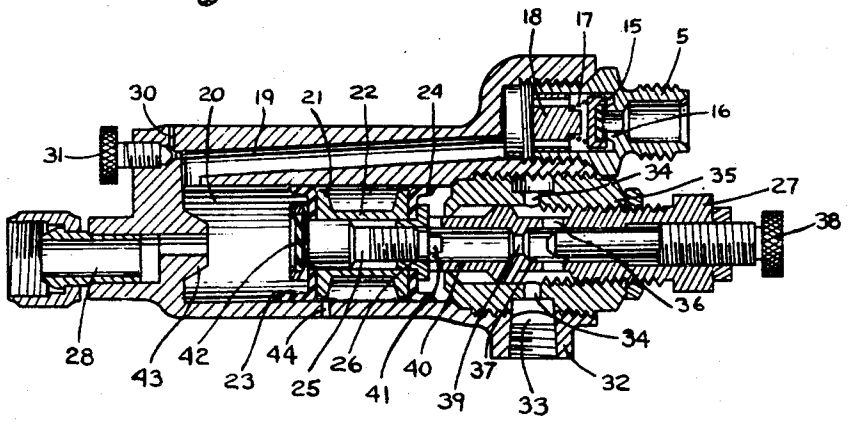


FIG. 2

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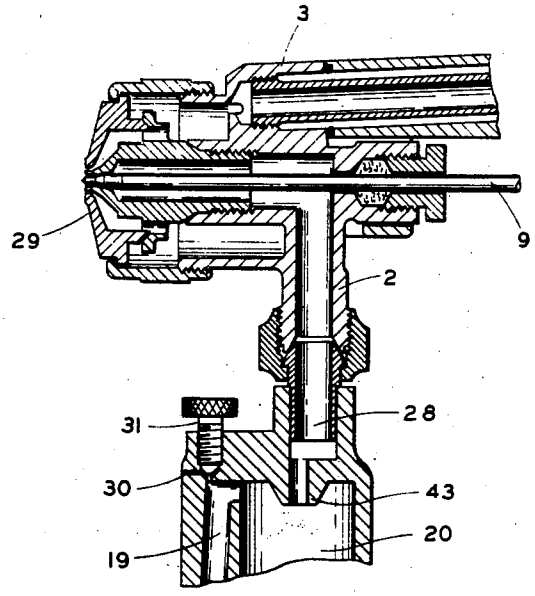


FIG. 3

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MATERIAL DELIVERY DEVICE

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2 Claims. (Cl. 299—140)

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This invention relates to a means for delivering to the nozzle of a spray gun a supply of coating material.

A principal object of the invention is the provision of such a device that may be relied upon to deliver a predetermined amount for successive times without variation.

Another object is the provision of a device of this type that is light and compact and may therefore be attached to the spray gun without being too burdensome or awkward to be supported by the operator.

A supplemental object of the invention is to provide a device for receiving spraying material under a comparatively low pressure and passing it on to the spray gun at a higher pressure.

A further object of the invention is the provision of adjustable means in such a device for changing the predetermined amount of the charge.

A still further object is the provision of means for varying the rate of flow of the material from the device to the nozzle.

Another important object of this invention is the provision of such a device that is automatic in action whereby each successive charge is introduced into the feeding chamber and is discharged therefrom without any special manipulation being required.

More specifically, it is an object of the invention to provide a fixed charge delivering device in which the supply pressure of the coating material is utilized for forcing the material into the feeding chamber, and the pressure of the atomizing air is utilized to force the fluid from the feeding chamber.

Other objects and advantages of the invention will be apparent upon reading the following specifications with reference to the drawings in which:

Figure 1 is an elevation, with parts broken away, of a spray gun having attached thereto a delivery device according to this invention;

Figure 2 is a longitudinal section of the device shown in Figure 1; and

Figure 3 is a vertical section of the forward end of the spray gun and the upper end of the delivery device attached to the spray gun.

In Figure 1 the delivery device 1 is shown attached to the coating material inlet connection 2 of a spray gun 3. The material supply hose 4, instead of being fastened in the regular manner directly to the spray gun, is joined to the material inlet connection 5 of the delivery device 1. The spray gun has a conventional trigger 6 which actuates successively the atomizing air valve 7 through stem 8, and the material needle valve 9. Air reaches air valve 7 from the air supply hose 10 and air supply passage 11. From the nozzle side of the air valve is a branch passage 12 ex-

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tending downwardly to the end of the gun handle 13. To this passage is connected a tubing 14 leading to the delivery device 1.

Just beyond the material inlet connection 5 (see Fig. 2) is a check valve 15 normally held to its seat 16 by spring 17. The latter is supported upon the ported bushing 18. Material flowing past the check valve 15 and through bushing 18 continues through passage 19 from which it enters the cylindrical measuring chamber 20.

Within this chamber is a floating piston or plunger member 21. This is composed of a spool shaped body 22 against the ends of which are held plunger leathers 23 and 24 between stud 25 and nut 26.

The pressure of the material flowing into the chamber 20 will force the plunger 21 to the end of the chamber against the castellated end of the adjustable stop member 27. Any air, initially trapped by the material in the coating material passage through the gun and also in the outlet passage 28 from the device, may be released by drawing the gun trigger rearwardly to pull the material needle valve 9 momentarily from its seat in the nozzle 29 of the spray gun. Likewise, air trapped within the measuring device may be released through vent passage 30 by opening valve 31.

When it is desired to proceed with the spray application of the charge of coating material within the device, the gun is directed as desired and the trigger pulled in the regular manner. The main portion of the atomizing air will then pass through air valve 7 toward the nozzle 29, but some air will be forced down passage 12 through the connecting tubing 14 to the air inlet 32 of the delivery device. From the inlet 32 this air travels around the annular passage 33 and through ports 34 into the centering plug 35. From plug 35 the air proceeds through ports 36 into throttling chamber 37 within the tubular stop member 27.

A hand needle valve 38 is adjustably mounted in the stop member 27 and may be utilized to vary the rate of flow of air through throttling chamber 37 by being set to extend more or less into port 39. From chamber 37 the air passes through restricted port 39, passage 40, and lateral openings 41 in the castellated end of stop member 27.

This air is under a pressure considerably greater than the pressure of the fluid coating material and therefore its thrust against the leather plunger 24 and that end of the plunger 21 will move the plunger against the fluid material and force the latter into the spray gun and out the spray nozzle, which is opened by the trigger movement. This pressure extends through the material in passage 19 and maintains the check valve 17 upon its seat.

Only the amount of coating material, displaced by the plunger 21 in the course of its movement under the effect of the atomizing air pressure, travels through passage 28 into the spray gun. The material in passage 19 is static during the spraying operation.

When the plunger 21 reaches the end of the chamber 20 the soft valve disc 42 in the head of stud 25 seats against the valve seat 43 around the entrance into passage 28. This prevents any further flow of material into the gun.

When the trigger 6 is then released and air valve 7 is returned to its seat, the air behind the plunger 21 is no longer supported by the flow of air through valve 7. The air behind the plunger will bleed back through the passages by which it came, then into the spray gun 3 and out the spray gun nozzle 29 into the atmosphere.

The supply pressure upon the coating material thus again becomes effective to move the check valve 15 from its seat and force more material through passage 19 and into chamber 20, driving plunger 21 back against stop member 27. The chamber 20 is thus automatically recharged and prepared for another spraying operation. This cycle is repeated with each successive trigger movement, and the displacement of the plunger being the same each time, each discharge contains the same amount of material.

A vent port 44 is provided in the side wall of the chamber 20 communicating with the space between the ends of the spool shaped plunger body 21. Any coating material or air leaking by the plunger leathers 23 and 24 will escape out this port and any such leakage may thus be detected and remedied.

The stop member 27 is adjustably threaded within the centering plug 35. It is held in place by lock nut 45. By setting the stop member 22 further into chamber 20, the stroke of the plunger 21 is shortened and the charge of material the plunger delivers to the spray gun is reduced. This adjustment, therefore, enables the charge to be varied according to the requirements of the coating operation. In order that the end of the stop member 27 meets the plunger 21 squarely, plug 35 is shaped and positioned to guide the end of the stop member along the axis of the chamber 20.

The speed with which the coating material is delivered to the spray gun may be adjusted by moving needle valve 38 into port 39. The less this port is thus closed the more readily will air pass through and act upon the plunger. In case the air flow is throttled, the plunger will move more slowly. The coating material flows to the spray gun and out the nozzle at a rate corresponding to the movement of the plunger as effected by the air pressure reaching it.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

I claim:

1. A material delivery device in combination with and for attachment to a spray gun, said spray gun utilizing air under comparatively high pressure for atomizing material supplied at a comparatively low pressure, having an air valve controlling the air flow therethrough, a material valve for controlling the material flow therethrough, a finger operated trigger with opening contact with both said valves, a discharge nozzle, and passages from the valves to the nozzle; said material delivery device including an inlet connection for pressure fed material, a cylindrical chamber, a passage joining the connection to one end of the cylindrical chamber, a check valve in the passage freely movable under slight pressure, a seat for the check valve located in the passage between the check valve and the inlet connection whereby the supply pressure of the material will move the check valve from its seat and permit the material to flow into and fill the chamber, a material outlet connection joining the device to the spray gun, there being an outlet passage from the center of the same end of the chamber, with which the inlet communicates, to the outlet connection, a double-faced reciprocable plunger within the chamber, a port covering surface on the end of the plunger sealing the outlet passage when the plunger is forced to that end of the chamber, and a communicating conduit extending from the other end of the chamber to the air passage in the spray gun between the air valve and the spray nozzle so that when the air valve is open, air at comparatively high pressure from the passage passes through the communicating conduit into the chamber, drives the plunger against the material, and forces the displaced material through the spray gun to the nozzle to be atomized, while exerting sufficient pressure through the material to hold the check valve in the material inlet passage against its seat in opposition to the lower pressure of the material supply.

2. A material delivery device in combination with and for attachment to a spray gun as set forth in claim 1 in which said material delivery device has a laterally ported tubular member, threadedly mounted and extending into the cylindrical chamber from the air entering end, said member being connected to and forming the outlet end portion of the communicating air conduit, and acting, by being turned upon its threaded mounting, as an adjustable stop for the reciprocable plunger.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
653,292	Fisher	July 10, 1900
967,450	Sholes	Aug. 16, 1910
1,067,999	Merritt	July 22, 1913
1,297,622	Whittaker	Mar. 18, 1919
1,332,544	Davis	Mar. 2, 1920
1,590,430	Erby	June 29, 1926
1,703,219	Wold	Feb. 26, 1929
2,079,564	Roehm	May 4, 1937
2,088,082	Davis	July 27, 1937
2,127,731	Hayes	Aug. 23, 1938
2,208,464	Logette et al.	July 16, 1940