May 12, 1959 C. EHRENSPERGER 2,886,252

SPRAY GUN

Filed March 29, 1956

Fig. 1

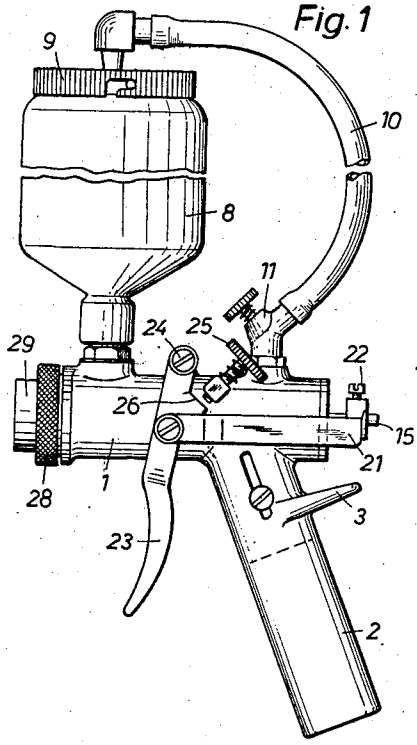

Fig. 2

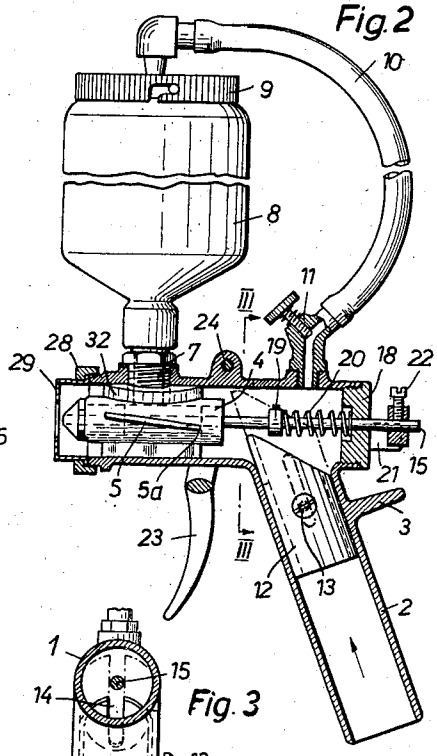

Fig. 3

Fig. 4

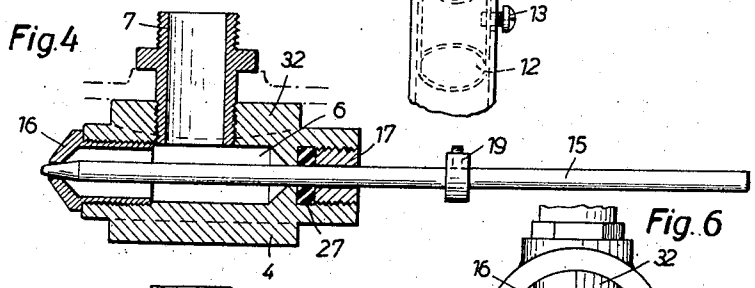

Fig. 5

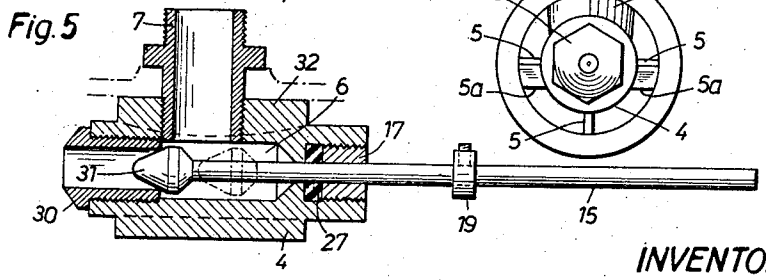

Fig. 6

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SPRAY GUN

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3 Claims. (Cl. 239—354)

This invention relates to pneumatically operated spray guns for spraying at low pressures more or less viscous materials, particularly plastic materials with or without additions of fillers, such as fibrous substances, sand-sawdust, plastic inserts, etc.

In spray guns of the above type, the low pressure compressed air serves, on the one hand for ejecting the material from the spray container, and on the other hand for shredding or atomizing the spraying material to be forced out through a nozzle.

It is an object of the invention to provide a spray gun capable of producing various pattern effects of the material sprayed upon a base, such as wall surfaces, ceilings, etc., by changing the amount of air supplied to the spray nozzle, or else by interrupting the air supply almost entirely in certain applications. In the latter case, however, the pressure exerted upon the spraying material enclosed in the container must be maintained to an extent required for pressing the material through the spraying nozzle.

According to the invention the spray gun comprises a case provided with a handle and including in its forward portion an inserted nozzle body which is interposed in the air current and connected with the receptacle containing the spraying material. The invention also provides a control member for the compressed air, which is adjustably arranged in the said case between the conduit connection for the supply of compressed air to the spraying material container, disposed at the rear portion of the gun case, and the said nozzle body, said control member enabling to throttle at will the air stream flowing to the nozzle body, while maintaining the air pressure exerted upon the spraying material provided in the container.

It is a further object of the invention to provide a spray gun, of which the nozzle body may comprise two or more interchangeable nozzles and associated nozzle pins, so that the spray gun may be used for spraying more fluid plastic masses, as well as plastic masses having incorporated therein coarser additions, such as e.g. fibrous material.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 is a side elevation of the spray gun,

Fig. 2 shows a part sectional view of the gun,

Fig. 3 is a section on the line III—III of Fig. 2,

Figs. 4 and 5 show each a longitudinal section of different nozzle arrangements to be used with the spray gun according to the invention, and

Fig. 6 is an end elevation view of the spraying nozzle, looking in the direction of the arrow in Fig. 4.

Referring to the drawings, the illustrated gun comprises a gun case having an essentially cylindrical upper portion 1, and downwardly inclined from this portion a handle part 2 with a hand support 3 cast integrally with said case, said handle part being formed as pipe branch for the connection of the compressed air tube.

An insert member 4 is arranged in the cylindrical portion 1 of the gun case. This insert member is of smaller diameter than said cylindrical portion and is surrounded by the stream of the compressed air supplied through the handle part 2; and the member 4 is provided with longitudinal ribs 5 for guiding the surrounding air flow and with an internal hollow space 6, which is connected to the spraying material container 8 by means of a pipe nipple 7. The insert member 4 is securely connected to the gun case by the said nipple, which extends through the wall of the case 1 and is screwed into said insert.

The container for the spraying material is closed at the top by a cover 9. The space within said container above the level of the spraying material communicates with the compressed air nipple by means of a conduit 10 connected to the gun case 1 through a throttle valve 11.

An air-regulating sleeve 12 movable in longitudinal direction is built into the handle part 2. The length of travel of this sleeve is limited by a stop screw 13 which is screwed into the sleeve 12 and engages a slot of the handle 2. A longitudinal slot 14 provided at the upper end of the sleeve 12 permits movement of the sleeve upwardly over the nozzle pin 15 until it abuts against the top wall of the cylindrical case, so as to control the air flow to the insert member 4, but nevertheless allows the application of full or regulable air pressure upon the spraying in the container 8 through the conduit 10. This control action on the air stream directed towards the nozzle outlet my be used for achieving particular pattern effects, since with reduced flow of air the spraying material is no longer atomized, but only shredded.

The insert member 4 is adapted for the reception of two different nozzles and nozzle pins dependent on the nature of the spraying material to be used. According to Fig. 4, a nozzle 16 having a relatively small opening is screwed into the forward portion of the insert member 4. For the purpose of regulating the discharge of the spraying material, the nozzle pin 15 having a conical extremity coacts with the opening of the nozzle. The nozzle pin is guided for longitudinal movement in a terminal plug 17 of the insert member 4 and in a screw plug 18 disposed at the rear end of the gun case 1. The back end of the valve pin 15 passes through the screw plug 18 and out of the gun case 1. Within the case 1 the pin 15 carries an adjustable stop 19 for the one end of a spring 20, of which the other end bears against the screw plug 18. The spring 20 acts to press the conical end of the nozzle pin into the nozzle opening.

Outside of the gun case, the nozzle pin is engaged by a U-shaped bracket 21 which is secured to the pin by means of a set screw 22. The bracket 21 extends forwardly with its two legs positioned along the case 1, and the ends of the legs are linked to the trigger lever 23 embracing the case by means of a forked portion, said lever being mounted on a pivot pin 24. Upon retraction of the trigger lever 23, the nozzle pin is moved against the action of the spring 20, so that the conical end of the pin clears the opening of the nozzle and the content of the spraying material container is forced out to the nozzle under compressed air pressure.

In order to limit the opening motion of the nozzle 15, the case 1 is provided with a stop screw 25 which limits the swinging movement of trigger lever 23 by bearing against a surface 26 of the lever.

A packing 27 is provided and retained by the terminal plug 17 in order to seal the zone where the nozzle pin 15 passes out of the insert member 4. On the nozzle end of the gun case an air cap 29 is mounted by means of an annular nut 28.

The pin and nozzle arrangement 15, 16 shown in Fig. 4 serves for spraying more fluid and more pure plastic

masses, such as dispersions, oily plastic materials, fine sand plastic, stone enamel, etc.

Moreover, by using smaller nozzles than the nozzle **16** shown in Fig. 4 and by means of a suitable customary spraying head, there can also be sprayed ordinary paints, lacquers, dispersions, emulsions, size colors, lime, etc.

The nozzle arrangement according to Fig. 5 has the same insert member 4 as the arrangement shown in Fig. 1. The nozzle **30**, however, is provided with a bore of greater diameter than the one shown in Fig. 4. The nozzle pin **15** has the same diameter as the pin in Fig. 4, but is provided with an enlarged pin head **31** cooperating with the rear end portion of the nozzle opening. When the nozzle pin is pulled to the rear by means of the trigger lever **23**, then the head **31**, as shown in dotted lines, opens the entire cross section of the nozzle opening for the passage of the spraying material. This nozzle arrangement is used for spraying fibrous plastics, coarse sand plastics or plastic masses having similar coarse additions, which require an unobstructed flow passage.

As is evident from Figs. 2 and 5, the lateral guiding ribs **5** of the insert member 4 are inclined or helically arranged with respect to the longitudinal axis of the cylindrical case **1**, for the purpose of obtaining a uniform distribution of air on the head of the nozzle around the entire circumference of the head. The insert member **4** is provided with an eye **32** for screwing the connecting nipple **7** in place. This eye prevents the air from streaming in longitudinal direction of the upper portion of the insert 4, so that without provision of guiding ribs **5** there would exist an air stream which would be weaker on the top side of the nozzle outlet than on the bottom side thereof. For this reason the entrance section for air, between the rear edges **5***a* of both lateral ribs **5** and the rear edge of the eye **32**, is greater than the section provided between the two edges **5***a* of the lateral rib and the rearward edge of the lower rib **5**. In this manner more air is passed to the upper side of the nozzle than without inclined lateral ribs, so that the air flow is substantially uniform around the entire circumference of the nozzle, and uniform effects of the sprayed material are assured.

As an air source for producing the required air stream or air pressure, any desired source of low pressure compressed air producing the necessary operating pressure may be used, such for instance as a compressor, a fan, or only the blower of a vacuum cleaner.

The spray gun permits the obtaining of the finest lacquer layers and as well a great variety of pattern effects by the use of plastic materials.

While I have shown a preferred practical embodiment of my improved spray gun, it will be understood that various changes and modifications may be made without departing from the spirit of my invention or the scope of the appended claims.

What I claim is:

1. A spray gun for spraying fluid materials of different viscosity by means of low pressure compressed air, comprising a gun case, a gun handle forming part of said case and having an air passage therethrough, a spray nozzle carrying member having a spray nozzle opening therein mounted in the forward part of said gun casing, a retractable nozzle pin having a head corresponding to the size of said spray nozzle opening for controlling the spray nozzle opening in said carrying member, a receptacle for the material to be sprayed mounted on the gun body and communicating with said nozzle carrying member, an air conduit leading from the rear portion of the gun casing to the top of said receptacle, and an air distributing member movably mounted in said gun handle movable transversely of said gun casing independently of said spray nozzle pin for controlling the amount of air flowing in said gun casing between said conduit and said nozzle carrying member, said air distributing member having a longitudinal slot therein slidable over the nozzle pin traversing the gun casing whereby the air directed to said nozzle carrying member may be controlled while maintaining the air pressure acting through the air conduit leading to said receptacle.

2. A spray gun as claimed in claim 1, wherein said air distributing member is formed as hollow sleeve slidably guided in the gun handle portion and adapted to project into the gun casing between said nozzle carrying member and said air conduit leading to the spray material receptacle.

3. A spray gun as claimed in claim 1, in which said nozzle pin head is enlarged and said spray nozzle carrying member has a hollow space in the end opposite to the end having the spray nozzle opening therein, the point at which said receptacle communicates with said spray nozzle carrying member being between said spray nozzle opening and said hollow space, said hollow space being of a size to accommodate said nozzle pin head, whereby when said nozzle pin is withdrawn until the nozzle pin head is located in said hollow space said head does not interfere with the flow of spraying material to the nozzle opening.

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