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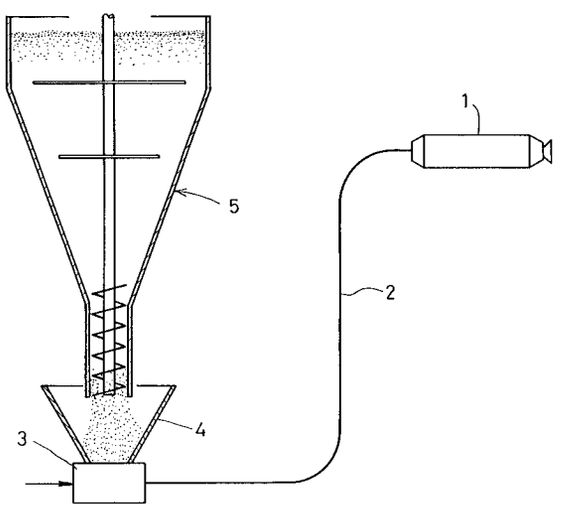
(54) Powder supply for triboelectric painting gun.

(57) According to the present invention, the discharge quantity of the powder paint from the frictional electrification gun (1) does not vary with the air pressure. The charge quantity of the powder paint can be increased by adjusting the air pressure. The feeder (5,9) of the powder paint to the frictional electrification gun (1) is provided independently of the injector (3), and the discharge quantity is determined by the feeder (5,9) provided separately from the injector (3).

FIG. 1



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The present invention relates to a frictional electrification type electrostatic painting device which electrically charges a powder paint by friction with a nonconductive resin tube by causing the powder paint to pass through the nonconductive resin tube.

In the conventional frictional electrification type electrostatic painting device, a powder paint is sucked from a paint tank by an injector, fed by the carrier air of the injector, and let pass through a gun having a nonconductive resin tube. The powder paint is charged with static electricity by friction with the inner wall of the nonconductive resin tube. The charged powder paint is discharged from the tip of the gun and applied onto the object to be painted.

In such a frictional electrification type electrostatic painting device, if the velocity of the carrier air is increased, the friction between the powder paint and the inner wall of the nonconductive resin tube is increased, thereby increasing the charge quantity.

Accordingly, in order to increase the charge quantity of the powder paint, it was necessary to increase the air pressure of the carrier air of the injector, or to let the acceleration air flow into the inlet of the gun.

In the conventional frictional electrification type electrostatic painting device, however, since the suction of the powder paint from the paint tank is carried out by the injector, if the air pressure of the injector is increased or the acceleration air is introduced into the gun, the suction volume of the powder paint changes. Thus, the powder discharge quantity is not stable.

Particularly, if the acceleration air is supplied, a resistance acts on the injector through the powder hose. As a result, the discharge quantity decreases and it becomes difficult to obtain a predetermined discharge quantity of the powder paint.

An object of the present invention is to increase the charge quantity of the powder paint by increasing the velocity of the powder paint passing through the nonconductive resin tube without affecting the discharge quantity of the powder paint.

In order to solve the aforementioned problems, according to the present invention, a feeder for feeding the powder paint to the gun having a nonconductive resin tube is provided independently of the injector.

Since a feeder for feeding the powder paint is provided independently of the injector, the discharge quantity of the powder paint is determined not by the air pressure of the carrier air of the injector, but by the feed quantity of the feeder. Therefore, even if the air pressure of the injector is changed, the discharge quantity of the powder paint does not change.

Thus, it becomes possible to increase the charge quantity of the powder paint by increasing the air pressure of the injector or blowing the acceleration air into the injector without affecting the discharge quantity of the powder paint.

According to the present invention, since the discharge quantity of the powder paint discharged from the gun is determined not by the air pressure/quantity of the injector, but by the feed quantity of the feeder provided independently of the injector, the air pressure can be adjusted so that a proper friction is caused within the gun, without giving any influence to the discharge quantity of the powder paint. Thus, the painting can be done stably.

Particularly, even if a recovered powder is used as the powder paint, according to the present invention, the powder can be charged sufficiently by adjusting the air pressure.

Furthermore, in the prior art, when the quantity of the powder paint discharged from the frictional electrification gun is measured, the quantity of the powder paint actually discharged from the gun had to be measured as the discharge quantity changed depending on the air pressure. Therefore, the powder paint charged by passing through the gun has to be collected, which may cause an accident of electric shock during the work.

According to the present invention, as the discharge quantity from the gun can be determined by the feed quantity of the feeder of the powder paint which is fed to the gun, regardless of the air pressure, the measurement of the discharge quantity can be done by measuring the quantity of the powder paint fed from the feeder before passing through the gun. This prevents the accident of electric shock in measuring the discharge quantity.

Other features and objects of the present invention will become apparent from the following description made with reference to the accompanying drawings, in which:

Fig. 1 is a schematic view showing the first embodiment of the present invention; and

Fig. 2 is a schematic view showing the second embodiment.

In the frictional electrification type electrostatic painting device shown in Fig. 1, an injector 3 is connected to a frictional electrification gun 1 via a powder hose 2, and a powder paint falls from a feeder 5 provided independently of the injector 3 to a hopper 4 of the injector 3. A screw-type paint tank is used as a feeder 5.

The frictional electrification gun 1 has a conductive layer provided on the outside of a nonconductive resin tube made of a material such as ethylene tetrafluoride. A voltmeter or an earth is connected to the conductive layer to remove from the conductive layer the charge of a polarity op-

posite to the polarity of the powder paint. This makes the powder paint easy to be charged.

As the feeder 5, a volumetric counting feeder of the powder paint shown in Fig. 2 may be used. In the feeder, a paint tank 6 which stores the powder paint in an air-dispersed condition is connected to an injector 7 for drawing it out. The powder paint drawn by the injector 7 is collected in a container 8. A screw feeder 9 is provided at the lower part of the container 8, and the powder paint in the container 8 is drawn out at a constant rate by the screw feeder 9 to be fed to the hopper 4 for the injector 3.

Alternatively, the acceleration air may be blown into the inlet portion of the frictional electrification gun 1.

Claims

1. A frictional electrification type electrostatic painting device having an injector connected to a gun including a tube of a nonconductive resin to cause a powder paint to pass through said gun to electrify the powder paint by friction, characterized in that a feeder for feeding the powder paint to said gun is provided independently of said injector.

2. A frictional electrification type electrostatic painting device as claimed in claim 1, wherein said feeder is a volumetric counting feeder.

3. A frictional electrification type electrostatic painting device as claimed in claim 1 or 2 wherein a hose for supplying air for acceleration is connected to said gun.

FIG. 1

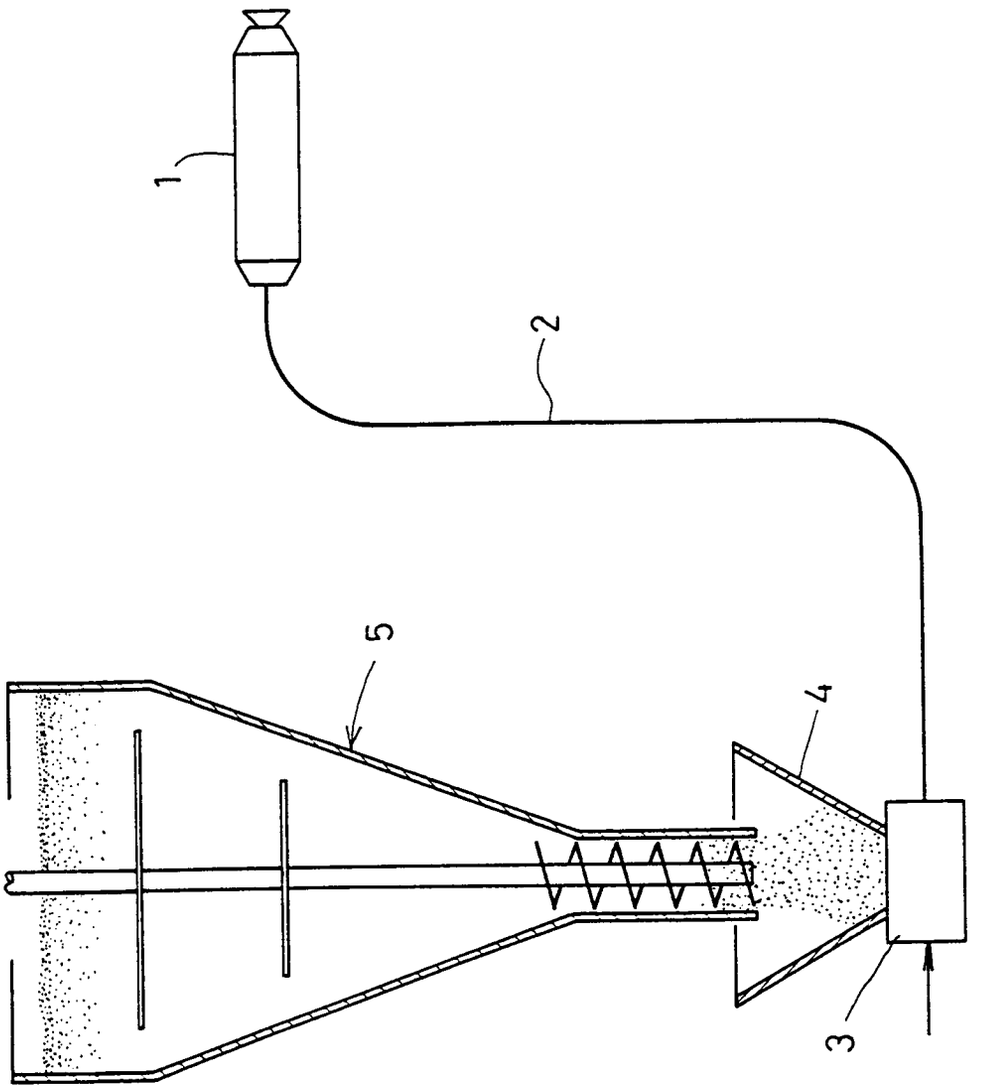
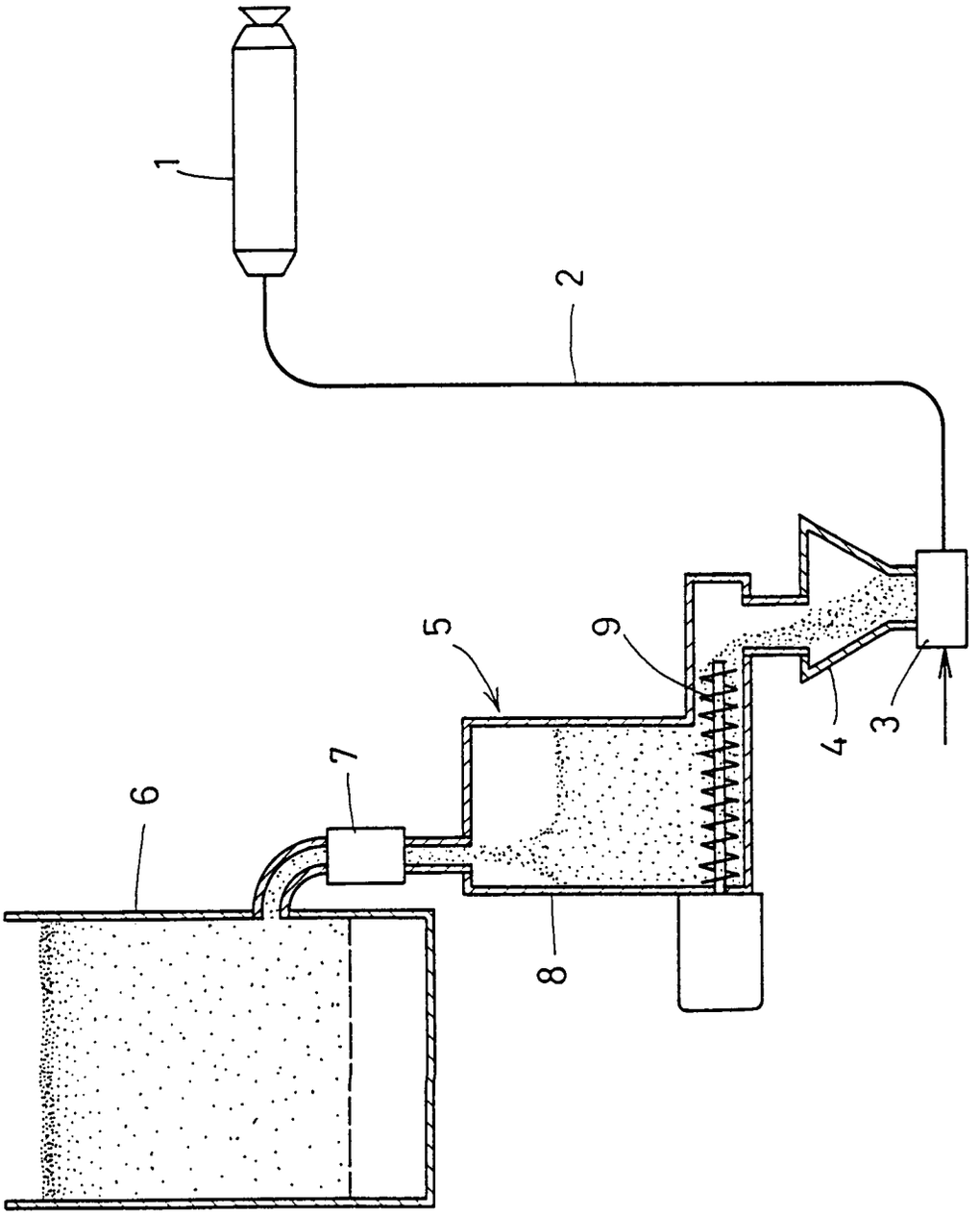


FIG. 2



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EUROPEAN SEARCH REPORT

Application Number
EP 94 10 8078

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	US-A-4 072 129 (BRIGHT ET AL.) * column 5, line 31 - line 43 * * column 6, line 46 - line 63; figure 6 *	1-3	B05B7/14 B05B5/047
A	US-A-3 313 908 (ROBERT UNGER AND ROBERT F. BYRAM) * column 8, line 17 - line 34; figure 8 *	1,2	
A	US-A-3 240 533 (GORDON V. MOMMSEN) * column 3, line 37 - line 59; figures *	1,2	
A	US-A-4 753 094 (SPEARS) * column 6, line 27 - line 39; figures 5-10 *	1,2	
A	US-A-4 090 666 (PECK) * column 3, line 22 - line 30; figure 2 *	3	
A	US-A-4 316 582 (KOBAYASHI ET AL.) * column 4, line 12 - line 42; figures 1,3 *	3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5) B05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	5 September 1994	Brévier, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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