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R. L. WALSH
COATING APPARATUS

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Fig. 1

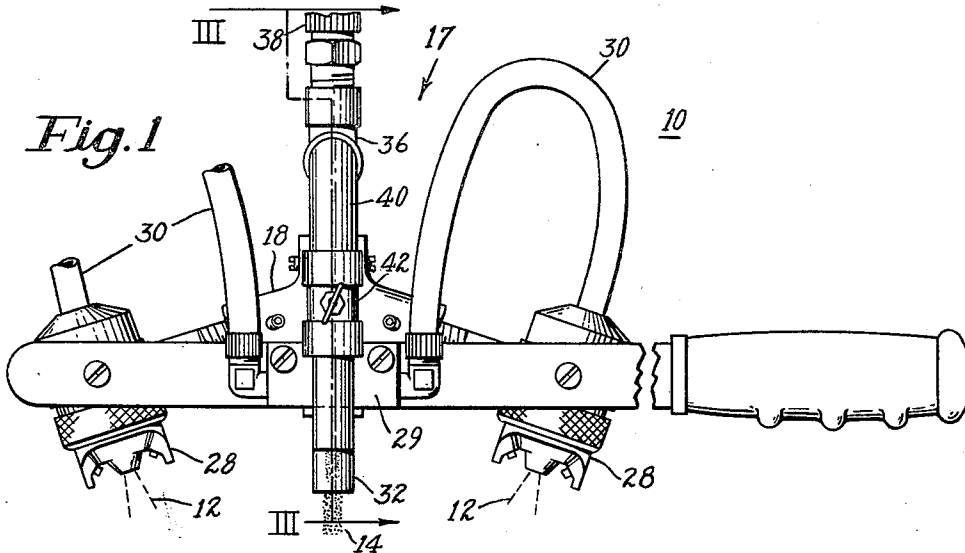


Fig. 2

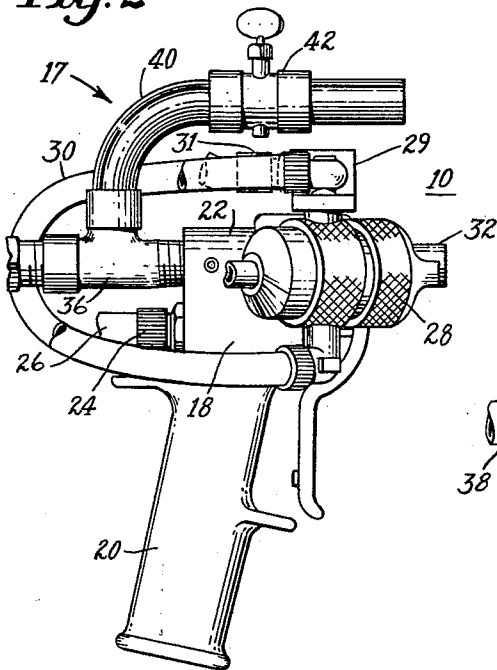
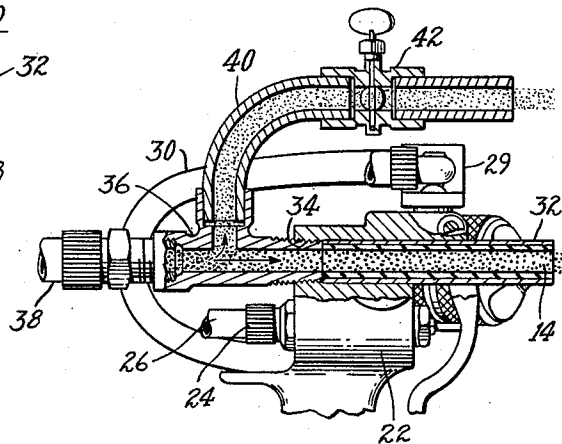


Fig. 3



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COATING APPARATUS

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This invention relates generally to apparatus for coating surfaces and has particular reference to the coating of a surface such as the side wall of a building and to a spray apparatus for applying said coating.

With the developments of new types of resins, such as polyurethanes and epoxys, having adhesion and weathering qualities superior to previously known coating resins, it has become feasible to utilize organic coating materials to apply weather resistant coatings to buildings having masonry exterior surfaces such as brick, cement, stucco and stone. To reduce the cost of the coating, and to provide various surface textures and colors, it is usually desirable to mix with the resin a particulate material such as sand, quartz, mica, glass beads, roofing granules or the like.

For speed of application, it is desirable to apply the coating by means of spray apparatus in which the resin and the particulate material are directed toward the surface simultaneously, with the resin and particulate material mixing in mid air, so that the individual particles receive a coating of resin before they impinge onto the wall. However, this method of applying the coating has been found to have certain difficulties that make it impractical for use in many applications. The weight and volume of the particulate material requires that it be stored on the ground and lifted to the spray gun in an air stream and projected by said air stream out of the gun toward the wall surface. The velocity so imparted to the particulate material causes a substantial proportion thereof to rebound off the wall without adhering. The material so wasted not only increases the raw material cost but also increases the hazards of the operation, since the wasted particles, in falling to the ground, may be blown about by the wind and damage adjacent buildings, automobiles and the like.

Another problem encountered in the application of such coatings is the fact that the particulate material frequently carries with it an undesirable amount of dust and particles below the desired size, which tends to impair the appearance of the coating.

In my copending application Seral No. 99,142, filed March 29, 1961 there is disclosed a method and apparatus for applying such coatings so as substantially to reduce the amount of particulate material wasted by rebounding off the wall. Although the apparatus and method disclosed therein is satisfactory for applying coatings in which the particulate material is composed of relatively fine particles, it has been found that the amount of material rebounding from the wall is a function of particle size and in some cases, where it is desired to apply particulate material of a larger size, an excessive amount of material rebounds from the wall and is wasted.

The object of the present invention is to provide apparatus for applying a coating of the type described in which the velocity of the particulate material is reduced in passing through the spray gun to reduce the amount of particulate material rebounding from the wall.

A further object of the invention is to provide an apparatus of the type described in which means is provided for separating a portion of the air used to lift the particulate material to the gun from the stream of particulate material substantially to reduce the velocity thereof before it issues from the gun.

A further object of the invention is to provide an ap-

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paratus of the type described in which means is provided for separating dust and particulate material below the desired particle size from the particulate material being directed toward the surface to be coated. Other objects of the invention will be apparent to one skilled in the art from the following description of a specific embodiment thereof.

In the drawing:

FIG. 1 is a top plan view of a spray apparatus embodying the features of the invention;

FIG. 2 is a view of the apparatus of FIG. 1 as seen from the left side; and

FIG. 3 is a view in section taken on line 3-3 of FIG. 1.

Referring to the drawing there is illustrated an apparatus 10 for applying a coating comprising a liquid component 12 such as a synthetic organic resin vehicle and a particulate material 14 such as sand to a surface, such as the wall of a building or the like.

The apparatus 10 includes a spray gun 17 similar to that shown in the above-identified application and comprises a frame 18 with a downwardly extending hand grip 20 having an air manifold 22 on the upper end thereof with an air connection 24 on the rear end to receive an air supply hose 26. A resin spray nozzle 28 is disposed on each side of the air manifold and the nozzles are connected to a resin manifold 29 by conduits 30. The resin manifold 29 may be supplied with resin under pressure through a rear connection 31.

A sand discharge nozzle 32 is disposed on the frame and the illustrated embodiment extends through the air manifold 22 and is supported thereby. The rear end of the sand supply nozzle is provided with a connection 34 receiving a T 36 onto the rear end of which may be attached a sand supply tube 38. Extending from the side branch of the T 36 is an air discharge tube 40 which extends upwardly and then turns forwardly to terminate in a discharge end disposed above the frame of the gun. To provide means for regulating the amount of air permitted to discharge from the tube 38, a valve 42 may be provided in the tube 40. A supply of sand or other particulate material may be lifted to the gun in an air stream through the supply tube 38 in the usual manner so that the sand is discharged from the tube 38 into the converging resin streams prior to impingement onto the wall as described in the above-identified application.

During operation of the gun the velocity of the sand particles entering the gun from the supply hose will depend on several factors among which are the pressure of the air source and the height of the gun above the air source, which in the normal case is a compressor stationed on the ground. As the coating operation proceeds either up or down the wall the velocity of the particles entering the gun will decrease or increase respectively, but in any case the air velocity required to lift efficiently relatively large particles will cause said particles to have a considerable velocity issuing from the gun.

To reduce the amount of rebound from the wall, the valve 42 may be opened to permit a portion of the air to exhaust through the tube 40 thereby reducing the velocity of the remaining portion of air carrying the sand particles through the gun.

Since the air discharge tube 40 opens to the upper side of the sand supply tube 38 there is little or no tendency for the particles to pass out through the tube 40 due to the effect of gravity and the inertia of the particles as they pass the opening to the tube 40. The velocity of the particles issuing from the gun may be readily controlled by adjustment of the valve 42 to compensate for variations in air supply pressure and variations in the height of the gun above the ground to reduce to a minimum the amount of particles rebounding from the wall.

The particulate material applied to the wall frequently contains some undesirable amount of dust and particles finer than that desired to be applied to the wall. The use of the air discharge tube 40 has been found to have the additional advantage in that a substantial portion of this undesirable material tends to pass out through the tube 40 with the exhausted air since it has less mass and inertia than particles of the desired size.

In the illustrative embodiment the tube 40 is directed forwardly so that the dust issuing therefrom is directed away from the operator. Since the gun is normally held an appreciable distance away from the wall, usually about two feet, the dust issuing therefrom does not reach the wall but is diffused into the atmosphere. It will be understood that the tube 40 may be made flexible so that the discharge thereof may be in any convenient direction or in some cases may be discharged into a filter bag.

Since certain other obvious changes may be made in the device without departing from the scope of the invention, it is intended that all matter contained herein be interpreted in an illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. An apparatus for applying particulate material to a surface comprising means for receiving said particulate material in an air stream having a velocity which is variable in accordance with the changes in conditions normally encountered during use of said apparatus, means for directing said air stream and the particulate material received therein toward said surface, means for exhausting a substantial portion of said air stream without exhausting any appreciable portion of said particulate material prior to the ejection of said particulate material from the directing means to reduce the velocity to which said particulate material is ejected from said directing means, and means for adjustably regulating the rate of exhaustion of said air stream by said exhausting means to thereby maintain the velocity at which said particulate material is ejected

from said directing means at a substantially constant velocity despite variations in the velocity of said air stream induced by changes in conditions normally encountered during use of said apparatus.

2. An apparatus for applying to a surface a coating comprising a liquid component and a separately applied component comprising a particulate material, said apparatus comprising a spray gun having means for projecting the liquid component toward the surface, and conduit means on the gun adapted to receive the particulate material in an air stream and direct it into the liquid component as it issues from the gun, and air by-pass means associated with said conduit means for exhausting a substantial portion of the air stream from the particulate material to reduce the velocity thereof prior to issuance from the directing means.

3. An apparatus for applying to a surface a coating comprising a liquid component and a separately applied component comprising a particulate material, said apparatus comprising a spray gun having means for projecting the liquid component toward the surface, and conduit means associated with the gun adapted to receive the particulate material in an air stream and direct it into the liquid component as it issues from the gun, and an air discharge tube extending laterally from said conduit to release a portion of the air from said air stream to thereby reduce the velocity of said particulate material, and means for regulating the amount of air flow through said air discharge tube.

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