

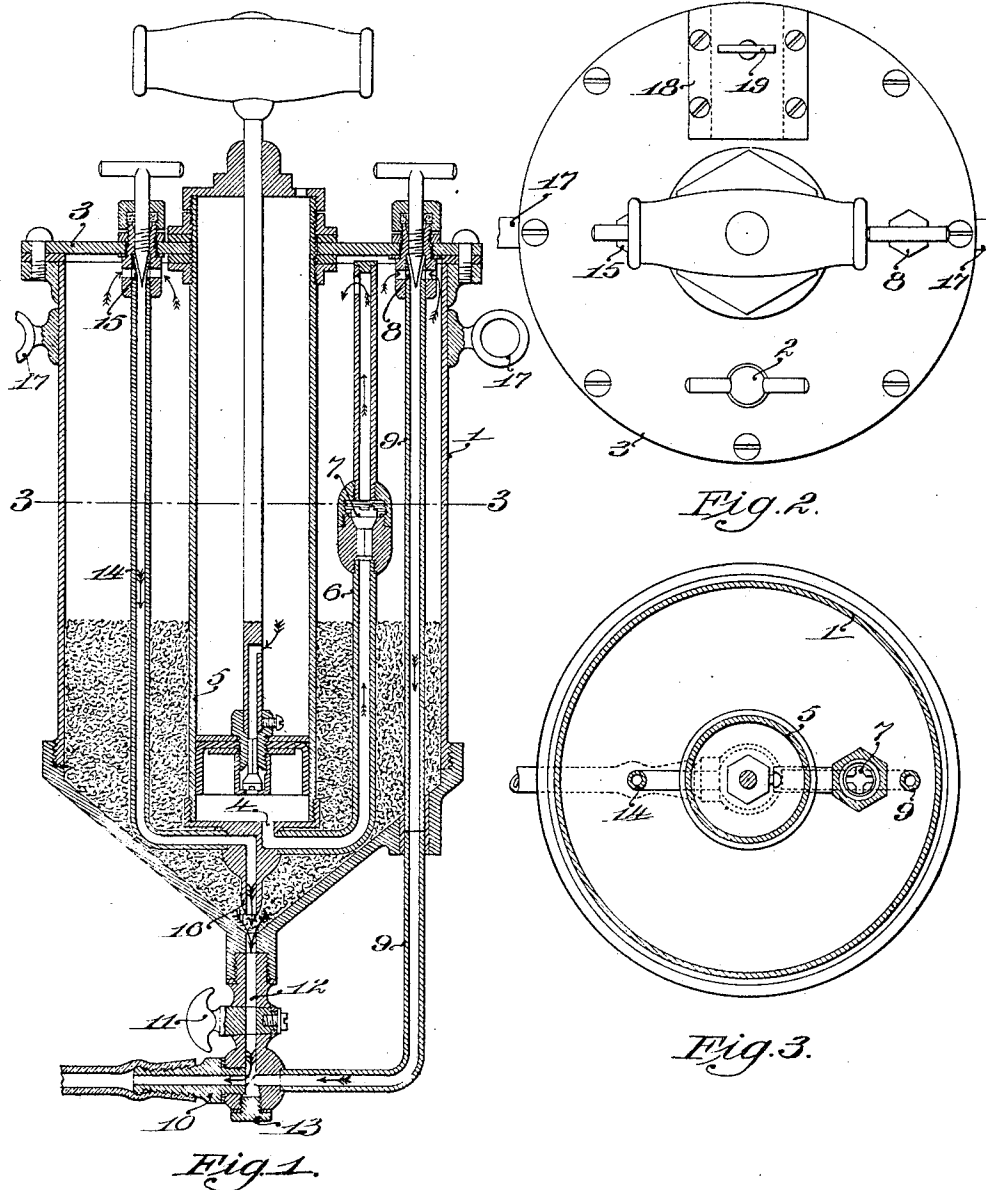
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PATENTED JULY 10, 1906.

G. D. COLEMAN.

APPARATUS FOR MINGLING FINELY DIVIDED SOLID SUBSTANCES WITH
A BLAST OF AIR.

APPLICATION FILED OCT. 9, 1903.



Witnesses
Edward S. Day
Christiana Hitching -

Inventor
George D. Coleman
by His Attorneys
Phillips Van Euren & Fish

UNITED STATES PATENT OFFICE.

GEORGE D. COLEMAN, OF BOSTON, MASSACHUSETTS.

APPARATUS FOR MINGLING FINELY-DIVIDED SOLID SUBSTANCES WITH A BLAST OF AIR.

No. 825,381.

Specification of Letters Patent.

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Application filed October 9, 1903. Serial No. 176,406.

To all whom it may concern:

Be it known that I, GEORGE D. COLEMAN, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Mingling Finely-Divided Solid Substances with a Blast of Air; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to apparatus for mingling finely-divided solid substances with a blast of air.

It is particularly adapted for use in making antifouling coatings, such as are described in United States Patents granted to me, No. 629,426, July 25, 1899, and Nos. 682,913 and 682,914, September 17, 1901, as well as for other purposes apparent to those skilled in the art. The operation of apparatus of this nature, as has heretofore been used, has been unsatisfactory, owing to the tendency of the finely-divided solid material to choke and pack and the difficulty of providing simple and effective means for feeding the material constantly and freely. This difficulty is particularly marked in the use of metallic powder, especially if the grains are coarse.

The present invention contemplates generally a receptacle for the comminuted material, means for producing a blast of air, and means for mingling the comminuted material with the air-blast, and its purpose is to produce improved means for feeding the material uniformly and freely and to reorganize, simplify, and improve devices of the above-described nature.

In the drawings accompanying this specification, Figure 1 is a vertical section of my improved apparatus. Fig. 2 is a plan of the same, and Fig. 3 is a horizontal section on line 3-3, Fig. 1.

The illustrated embodiment of the invention is constructed as follows: A closed cylindrical tank 1 serves as a reservoir for the comminuted material and for the air for producing the blast, and also contains a part of the mechanisms for producing the air-blast and for feeding the material. A screw-plug 2 gives access to interior of the tank for filling the same, or for a purpose to be described later. A hand-pump for compressing air is mounted for convenience in the cover 3 of

the tank. The air from the pump is discharged through an opening 4 in the bottom of the pump-cylinder 5. Thence it passes up a tube 6, through a check-valve 7, and is discharged near the top of the tank and above the level of the comminuted material contained therein. The air for the air-blast passes through a valve 8 and down a tube 9, which is connected by a nipple 10 to a piece of flexible tubing, terminating in a suitable nozzle (not shown) for directing the blast. The comminuted material is allowed to mingle with the air-blast by opening a valve 11, which controls a feeding-passage 12, connecting the hopper-shaped bottom of the tank with the air-blast tube 9. A plug 13 gives access to this passage to clear it if it becomes choked. A tube 14, controlled by a valve 15, conveys air from the upper part of the tank to a nozzle 16, opening near the passage 12. Rings 17 17 serve for the attachment of a strap, by means of which the apparatus may be conveniently carried by the operator. A socket 18 and a set-screw 19 are provided, by means of which the device may, when desired, be attached to an upright on a stand which may be stationary or movable.

The operation of the apparatus is as follows: The tank is partly filled with the comminuted material—*e. g.*, copper-filings—through the filling-plug 2. The pump is next operated, and the valve 8 is opened to permit a current of air to pass through the nipple and the flexible tube to the spraying-nozzle. The valve 11 is opened sufficiently to allow the proper amount of copper-filings to mingle with the air-blast. The valve 15 also is opened, and air passes down the tube 14 and out of the nozzle 16. This air causes a stream of air to pass down the feeding-passage 12, whereby the movement of the copper is greatly facilitated and choking of the passage is prevented. The mingled copper and air traverse the flexible tube, and the copper is discharged therefrom in a spray. The operator directs the jet against the surface of wet paint or other binding material and simultaneously operates the hand-pump to maintain the blast. If desired, the plug 2 may be removed, and the air-pressure in the reservoir may be obtained by connecting the opening with a source of compressed air, and in such case the operation of the apparatus is identically the same as above described except that the air-pump is idle.

I am aware that it has been proposed in

apparatus of this character to provide a closed receptacle for comminuted material and to apply air-pressure to such receptacle for the purpose of facilitating the discharge of the comminuted material therefrom; but such construction is clearly differentiated from my invention in important respects, and particularly by the fact that in such construction the comminuted material impedes the flow of air therethrough and diminishes the volume of air passing through the feed-passage, whereas in my construction the air which facilitates the flow of comminuted material through the feed-passage is delivered at a point near such feed-passage. Again, it has heretofore been customary to mingle the air and the material at or near the spraying-nozzle. This necessitates the use of a plurality of flexible tubes to connect the air-supply and the receptacle for the material with the spraying-nozzle. In my device by combining the air-receptacle and the receptacle for material and by mingling the air and the material at a point adjacent to the receptacle I am able to produce a very compact and convenient apparatus and to dispense with the use of superfluous flexible connections.

An important feature of my invention consists in the introduction of air into the material to be fed at a point near the delivery-opening and in the relation of the parts, whereby increased simplicity and efficiency are gained.

Having thus described my invention and its mode of operation, I claim as new and desire to secure by Letters Patent—

1. An apparatus for mingling finely-divided solid substances with a blast of air, having, in combination, a receptacle for the finely-divided material, means for producing an air-blast, means for feeding the said material into the air-blast, and means for introducing air into the said material at a point near the passage through which the material is admitted to the air-blast, substantially as described.

2. An apparatus for mingling finely-divided solid substances with a blast of air, having, in combination, a receptacle for the finely-divided material, means for producing a blast of air, a passage through which the said material may be admitted into the air-blast, and means for causing a current of air to traverse said passage and facilitate the

passage of the said material therethrough, substantially as described.

3. An apparatus for mingling finely-divided solid substances with a blast of air, having, in combination, a receptacle for the finely-divided material, means for supplying compressed air, a valve-controlled air-blast passage from said means, a valve-controlled feeding-passage from the receptacle to the air-blast passage, and a valve-controlled passage from the air-supplying means to a point in the receptacle adjacent to the feeding-passage, serving to create a current of air through the feeding-passage to facilitate the feeding of the material therethrough, substantially as described.

4. An apparatus for mingling finely-divided solid substances with a blast of air, having, in combination, a receptacle for the finely-divided material, means for producing a blast of air, a feed-passage through which the said material is fed from the receptacle, and an air-passage having an outlet directed toward the feed-passage to facilitate the passage of the material therethrough, substantially as described.

5. An apparatus for mingling finely-divided solid substances with a blast of air, having, in combination, a receptacle, means for supplying said receptacle with compressed air, a passage from the upper part of said receptacle, a connecting-passage from the lower part of said receptacle, a passage from the upper part of said receptacle to the lower part thereof, and valves controlling said passages, substantially as described.

6. An apparatus for mingling finely-divided solid substances with a blast of air, having, in combination, a tank, an air-pump delivering into said tank, a delivery-passage, a passage for conducting air from said tank to said delivery-passage, a passage for conducting material to be sprayed from said tank to said delivery-passage, and a passage for conducting air from said tank to said passage for conducting material, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEO. D. COLEMAN.

Witnesses:

HORACE VAN EVEREN,
FRED O. FISH.