

April 16, 1935.

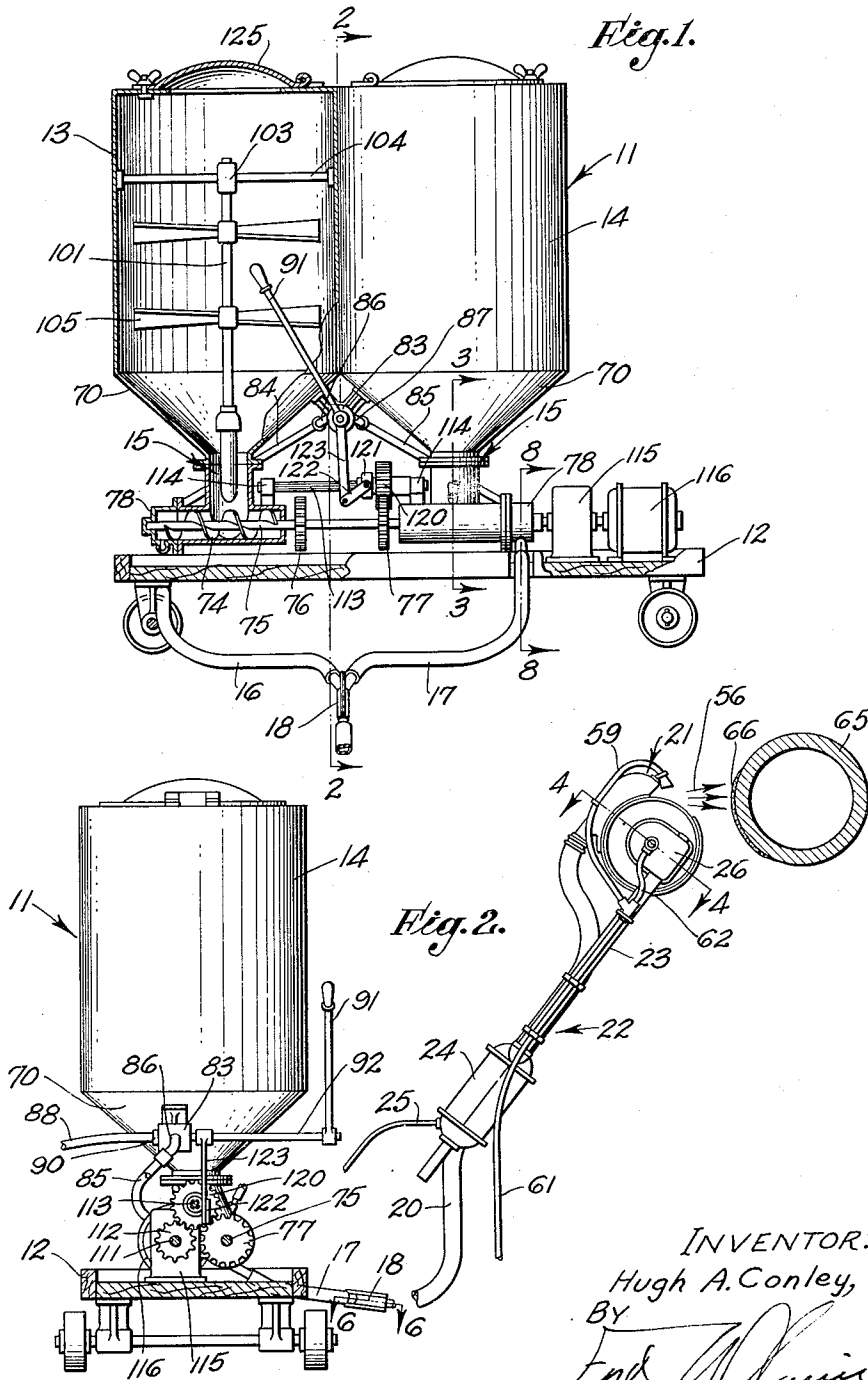
H. A. CONLEY

1,997,897

COATING AND PLASTERING MACHINE

Filed Feb. 14, 1931

3 Sheets-Sheet 1



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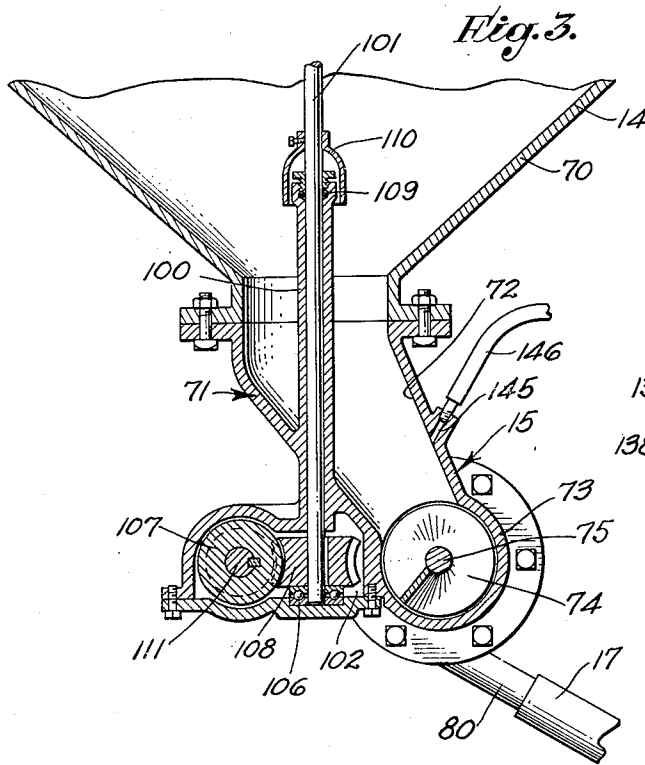
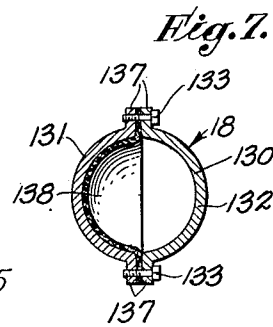
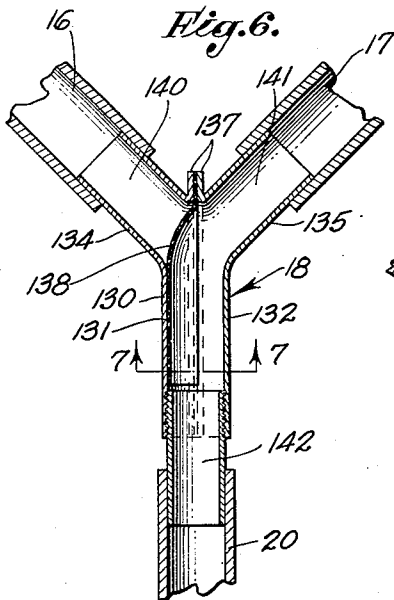
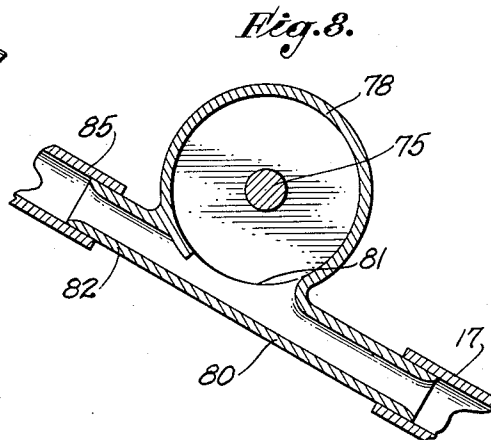
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COATING AND PLASTERING MACHINE

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3 Sheets-Sheet 2.



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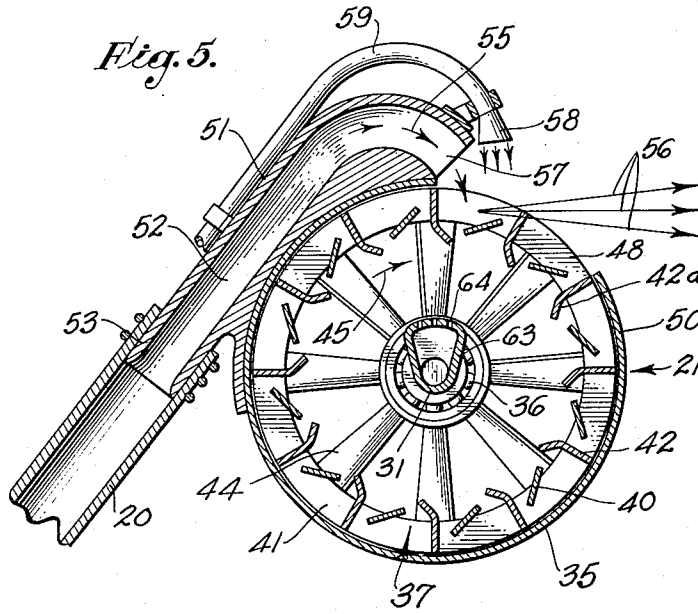
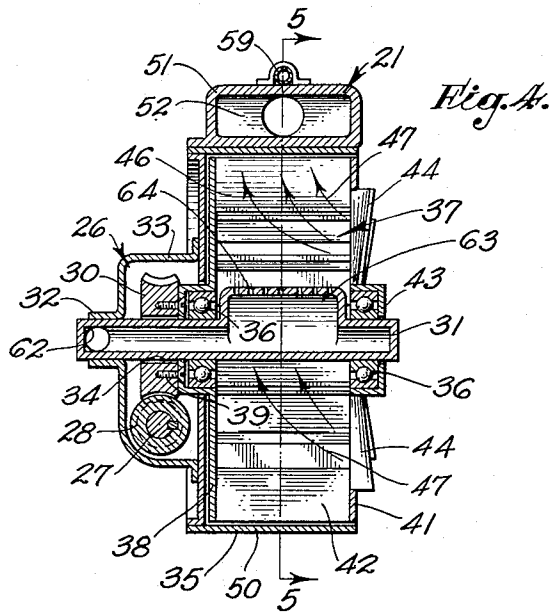
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COATING AND PLASTERING MACHINE

Filed Feb. 14, 1931

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

1,997,897

COATING AND PLASTERING MACHINE

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Application February 14, 1931, Serial No. 515,701

7 Claims. (Cl. 91-45)

My invention relates to plastering or surface coating machines employing a delivery head which receives the ingredients from which the coating is formed and mixes these ingredients as part of the operation of applying them to a surface to be coated. The invention is of especial utility in applying plaster, insulating, and weather-proof coatings to wall members and is also of utility for acoustic purposes wherein sound-proof porous coatings are applied to walls of auditoriums or rooms wherein reverberation and echo are to be maintained at a minimum.

In the use of this type of machine the coating material is composed of solids in granular or powdered form and a binder material or a binder and a diluent.

In the use of the invention for applying plaster to walls, the materials generally selected include sand or finely ground rock, lime, cement, water, etc. The cement or lime serves as a binder for the sand or rock particles but requires the presence of water in order to produce adhesion of the binder materials to the wall and to the sand and rock particles. For other coatings, such as a somastic coating for water-proofing and insulating pipe lines, sand and gravel are employed as an aggregate, and a pitch or tar substance is used as a binder. This pitch or tar binder in such use of the invention is delivered to the applying head in melted condition so as to readily adhere to the particles of other materials employed in the coating. Upon hardening or solidifying, the tar or pitch binder effectively holds the non-adhesive particles together.

It is an object of my invention to provide a machine of this character having a pair of hoppers for the dry materials and feeding means for delivering the dry materials to the applying head from one hopper at a time, making it possible to fill the other hopper so that it will be ready for use when the first hopper is emptied.

It is a further object of the invention to provide a novel type of valve connection and valve means for controlling the flow of air through the conduits connected with the delivery hose which leads to the applying head, in such a manner that air will not be discharged in reverse direction through the hopper which is held open for the purpose of being filled.

A further object of the invention is to provide a simple combined drive and valve controlling means for automatically controlling the distribution of air to the delivery means of the hoppers and for selectively driving the feeding

mechanisms associated with the respective hoppers.

A further object of the invention is to provide a simple form of rotary applying mechanism for use in the applying head of the device, which will effectively mix the constituents of the coating to be applied, which will not readily become clogged, and which may be easily cleaned.

A further object of the invention is to provide in an applying head a rotary member having peripherally arranged radial flinging or bathing members disposed around a circular interior space and having a spray or fluid delivery device within this space.

A further object of the invention is to provide an applying head having external delivery passages for the delivery of constituent material into the path of the rotating blades or bat members in an inward and forward direction.

Further objects and advantages of the invention will be made evident throughout the following part of the specification.

Referring to the drawings, which are for illustrative purposes only,

Fig. 1 is a front elevation of the feeding device for feeding constituent solid materials to the applying head of the coating device.

Fig. 2 is a vertical cross section taken substantially on a plane represented by the line 2-2 of Fig. 1, showing the applying head attached to the feeding device.

Fig. 3 is an enlarged section on a plane represented by the line 3-3 of Fig. 1.

Fig. 4 is an enlarged cross section on a plane represented by the line 4-4 of Fig. 2.

Fig. 5 is a cross section on a plane represented by the line 5-5 of Fig. 4.

Fig. 6 is an enlarged cross section on a plane represented by the line 6-6 of Fig. 2, showing the construction of the automatic non-reverse valve.

Fig. 7 is a cross section on a plane represented by the line 7-7 of Fig. 6.

Fig. 8 is an enlarged cross section on a plane represented by the line 8-8 of Fig. 1.

As shown best in Figs. 1 and 2 my invention employs a feeding device 11 including a carriage 12 on which hoppers 13 and 14 are mounted and feeding mechanisms 15 at the lower ends of the hoppers 13 and 14 for delivering solid materials into an air stream which passes either through a flexible conduit 16 or a flexible conduit 17 to a Y-shaped valve member 18 which is connected by means of a delivery hose 20 to the applying head 21 of an applying device 22. The applying device

includes a hollow handle 23 having an electric motor 24 secured to its lower end, which electric motor may be energized by current delivered through a cord or cable 25. At the upper or outer end of the handle 23, a gear box 26 is secured. From the motor 24 to the gear box 26, a drive shaft 27 is extended, and within the gear box 26 a worm 28 is secured to the upper end of the shaft 27 in position to drive a worm gear 30 which is also mounted in the gear box 26. As shown in Fig. 4, a tubular member 31 extends from a boss 32 formed in the outer wall 33 of the gear box 26 through the central opening 34 of the worm gear 30 into a cylindrical casing 35. Supported on this member 31 are bearings 36 which carry a rotor 37 having an inner wall 38 which is secured by means of screws 39 to the worm gear 30. In alignment with the wall 38 is a concentric ring 41 which is of the same external diameter as the wall 38, and between the peripheral portion of the wall 38 and the inner face of the ring 41 radial members or blades 42 are extended. To increase the fan action of the members 42, the inner edges thereof may be bent forwardly as indicated at 42a, and for the purpose of directing a greater portion of the air which travels outwardly against the rearward faces of the radial members 42, diagonal baffles 40 are extended across the lower portions of the spaces between the members 42. These baffles 40 slope forwardly and outwardly so that the inner faces thereof are inclined toward the rear faces of the members 42. It is not intended to convey the idea that these baffles are necessary in all uses of the invention, as when heavy solid materials are employed, the tendency for such materials to collect on the rear faces of the blades 42 is not very great; but where the solid materials are light weight or where the diluent materials are of very adhesive character, the baffles are employed to assist in the cleaning action of the rear faces of the blades.

The rightward bearing 36 supports a hub 43 which is connected to the ring 41 by means of fan blades 44 which are so formed that when the rotor 37 revolves in the forward direction indicated by the arrow 45 of Fig. 5, air will be drawn into the space 46 within the rotor 37 as indicated by arrows 47, and this air will be discharged outwardly through an opening 48 in the upper rightward portion of the cylindrical wall 50 of the casing 35. On the upper and rearward portion of the casing 35, walls 51 form a solids delivery passage 52 having an inlet nipple 53 to which the tubular member or delivery hose 20 may be attached, and having its outer end curved forwardly and downwardly toward the opening 48 in the upper forward part of the casing 35 so as to deliver a flow of air and entrained solids, as indicated by the arrows 55, into the path of movement of the members 42 which engage the particles and cause them to be flung forwardly, as indicated by the arrows 56. Above and adjacent the outlet 57 of the passage 52 is a fluid spray nozzle 58 which is fed through a tube 59 which extends over the top of the passage 52 and is connected to a water hose 61. A branch pipe or tube 62 is extended from the hose 61 to the leftward end of the tubular member 31, as shown in Figs. 2 and 4. This tubular member 31 is provided with an upwardly projecting spray head 63 having upwardly directed spray openings 64 which discharge water upwardly within the space 46 at the same time water is being sprayed downwardly from the spray nozzle 58. The stream of air and entrained solids issuing from the outlet

57 of the passage 52 is combined with particles of water fed into the stream from both above and below, thus accomplishing a thorough moistening of the solid particles before they are thrown by the applying head 21, as shown in Fig. 2, onto a wall such as provided by a pipe 65 so as to form a coating 66 thereon.

As shown in Figs. 1 and 3, the feeding mechanisms 15 which are secured to the lower conical ends 70 of the hoppers 13 and 14 include a body 71 having a downwardly and forwardly sloping inlet wall 72 which communicates with a horizontally and laterally directed cylindrical wall 73 in which a feed screw 74 is mounted on a shaft 75. As shown in Fig. 1, the shafts 75 project beyond the ends of the tubular walls 73 and have drive gears 76 and 77 mounted respectively thereon. At the outer end of each tubular wall 73 is a cup-shaped casing 78 forming a delivery member into which a screw 74 discharges. As shown in Fig. 8, a downwardly and forwardly sloping tube 80 intersects the lower portion of each casing 78 and communicates with the interior of the casing 78 through an opening 81. The inlet ends 82 of the tubes 80 connect with a three-way valve 83 through hose members 84 and 85 which connect respectively to the outlets 86 and 87 of the valve 83. Air under pressure is fed through an air inlet hose 88 to the inlet 90 of the valve 83, and depending upon the position of the control lever 91 which is mounted on the extended shaft 92 of the valve 83, the stream of air passes through either the hose 84 or the hose 85 through the tube 80 connected with the casing 78 and through either the hose 16 or 17 into the non-reverse valve 18 which connects to the delivery hose 20 which extends to the passage 52 of the applying head 21. During this passage of air, a screw 74 draws the dry materials from the associated inlet member 72 and moves them into the adjacent casing 78 wherein they are picked up by the air stream and carried to the applying head.

Each member 71 has a vertical bearing 100 through which an agitator shaft 101 extends from a gear case 102 to the interior of the associated hopper 13 or 14, the upper end of the shaft 101 being supported by a bearing 103 carried by a spider 104. The shaft 101 is provided with agitator paddles 105 and is supported on a thrust bearing 106. The shaft 101 is driven by means of a worm 107 which engages a worm gear 108 secured to the lower end of the shaft, and the bearing 100 is protected from entry of abrasive materials by a packing member 109 at its upper end. In addition to this, an inverted cup 110 is mounted on the shaft 101 above and enclosing the upper end of the bearing 100. Extending laterally from the gear case 102 is a shaft 111 on which the worm 107 is mounted. It is to be understood that each of these mechanisms is duplicated in the feeding devices 15 shown with the respective hoppers 13 and 14; therefore, on the outer ends of the respective shafts 111 gears 112 are mounted which respectively engage the gears 76 and 77 in the manner shown in Fig. 2. Above the gears 76 and 77 a drive shaft 113 is held in bearings 114, this drive shaft being driven from a gear box 115 which is in turn connected to a power source, such as a motor 116. Splined on the shaft 113 in position to slide between the bearings 114 is a drive pinion 120 which carries a non-rotating collar 121 which connects by means of a link 122 to a lever 123 which projects downwardly from the shaft 92 of the valve 83. By swinging the handle 91, the valve 83 may be op-

erated, and at the same time the pinion 120 may be moved into engagement with the proper gear 76 or 77 so as to drive the feeding mechanism 15 to which air is being delivered by the valve 83.

5 With the handle in the position shown in Fig. 1, the valve is so set that air will be delivered through the hose member 85 to the casing 78 associated with the feeding mechanism 15 of the hopper 14. Also, the pinion 120 is held in en-
10 gagement with the gear 77 so as to drive the feed screw associated with the hopper 14. During this time no air is delivered through the hose member 84, and the cover 125 of the hopper 13 may be raised to permit refilling of the hopper
15 with solid materials.

The non-reverse valve member 18 is constructed in the manner shown in Fig. 6 and consists of an outlet pipe 130 comprised of a pair of semi-cylindrical sections 131 and 132 which
20 are flanged and are adapted to be secured together by means of screws or bolts 133. From the rearward or upper portions of the members 131 and 132, branch inlet pipes 134 and 135 extend. Between the flanges 137 of the members 131 and
25 132 a movable closure member in the form of a wall 138 of canvas or other rugged fabric is clamped. The wall 138 is adapted to close one or the other of the openings 140 and 141 of the inlet members 134 and 135 so as to prevent a
30 reverse flow of air through the opening which the wall 138 obstructs.

As an example of the operation of the valve member 138, it may be assumed that air and entrained solid materials are passing through the
35 connecting tubular member 17 and the inlet member 135 into the outlet portion 130 which connects by means of a nipple 142 with the tubular delivery member 20 connecting with the applying head 21. At this time the force of
40 the air holds the wall 138 leftwardly against the inner face of the semi-cylindrical member 131, thereby effectively closing the opening 140 and preventing passage of air in reverse direction through the connecting hose 16 into the
45 hopper 13. When the hopper 13 is in use and materials are being withdrawn therefrom, air and entrained solids will pass through the connecting hose 16 and the inlet member 134 and will deflect the wall 138 rightwardly so as to
50 close the opening 141 to prevent a reverse flow of air into the hopper 14.

An important feature of my invention is that the solid materials, upon being discharged through the passage 52, are thoroughly wetted
55 by sprays of water from above and below, thereby forming a consistent mixture. Another feature of my new applying head is the means which I employ to prevent accumulations of plaster materials on the backs of the blades 42 and in
60 the spaces between the blades. It is a well known fact that when a member is moved through the air, a partial vacuum is formed adjacent the rear face thereof, with the result that particles of material will collect on the
65 rear face. In my new rotary applying device, the flinging members or blades 42, which may be made of metal or other material, are peripherally arranged, and effective means is provided for delivering an outward flow of air into the
70 spaces between these vanes so as to keep the condition of partial vacuum at a minimum and also to clean the surfaces of the blades. This flow of air is produced by the action of the fan blades 44 and by the centrifugal action of the
75 members 42. When the rotor 37 is rotated at

operating speed, air travels outwardly through the opening 48 at relatively high velocity. In this air is carried a spray of water from the spray member 63 so that there is a constant
5 washing of the surfaces of the blades 42 in addition to the cleansing action of the blast of air which passes therethrough. To prevent creating dust in the atmosphere, the solid materials, where they are of fine character, may be moistened before being fed into the air stream
10 passing through the delivery members or casings 78, by introduction of a controlled amount of water through water inlets 145 which are connected to the inlet walls 72, as shown in Fig. 3, and are fed through hose members 146.
15

Although I have herein shown and described my invention in simple and operative form, it is recognized that certain parts and elements thereof are representative of other parts, elements or mechanisms which may be used in
20 substantially the same manner to accomplish substantially the same results; therefore, it is to be understood that my invention is not to be limited to the details disclosed herein but is to be accorded the full scope of the following
25 claims.

I claim as my invention:

1. A device for applying a coating, including: an applying means; walls forming a tubular member leading to said applying means; primary
30 and secondary hoppers having substantially tight covers; primary and secondary delivery means respectively at the lower ends of said primary and secondary hoppers, there being a conveying device in each of said delivery means; means for
35 connecting said delivery means to said tubular member; valve means for controlling a flow of air through the outlets of said delivery means for carrying materials from said delivery means to said tubular member; a power device; trans-
40 mission means for transmitting power selectively from said power device to said conveying devices of said delivery means; a control lever adapted to selectively operate said valve means so as to deliver air to the outlet of one or the other of
45 said delivery means; and a connection between said lever and said transmission means for causing said transmission means to deliver power to the conveying device of the delivery means the outlet of which is receiving air from said valve
50 means.

2. A device for applying a coating, including: an applying head; a pair of hoppers; primary and secondary delivery means respectively connected to the lower ends of said hoppers; a pri-
55 mary feed screw in said primary delivery means; a secondary feed screw in said secondary delivery means; a primary gear connected to said primary feed screw; a secondary gear connected to said secondary feed screw; a primary outlet casing at
60 the outer end of said primary feed screw; a secondary outlet casing at the outer end of said secondary feed screw; tubular members leading from said outlet casings and being connected to said applying head; air inlet tubes leading to and
65 connecting with said outlet casings; valve means for selectively delivering air to said air inlet tubes; a driven member having gear means adapted to selectively engage said primary and secondary gears; a lever for operating said valve
70 means; and a connection between said lever and said gear means to produce operative engagement of said gear means with said primary gear or said secondary gear in accordance with the
75 operation of said valve means by said lever.

3. A device for applying a coating, including: an applying head; walls forming a tubular member leading to said applying head; primary and secondary hoppers having substantially tight covers; primary and secondary delivery means connected respectively with said hoppers; walls forming primary and secondary connecting tubes; a Y-fitting for connecting said tubular member to said primary and secondary delivery means, said Y-fitting having a pair of inlet openings and having a movable wall therein for covering one of its inlet openings when air is passing through the other of its inlet openings; means for selectively operating said primary and secondary delivery means; means for forcing air through said connecting tubes into said tubular member so as to convey materials delivered from said hoppers by said delivery means into said connecting tubes; and valve means for so controlling the flow of air that said flow of air will pass only through the connecting tube associated with the delivery means in operation.
4. A device of the character described for applying materials so as to form a coating, including: a rotary member having impelling means thereon; means for driving said rotary member; walls forming a nozzle directed so as to deliver a stream of air and solid materials into the path of movement of said impelling means; and fluid delivery means within said rotary member for delivering fluid radially outwardly into the path of movement of said impelling means.
5. A device of the character described for applying materials so as to form a coating, including: a rotary member having impelling means thereon; means for driving said rotary member;

walls forming a nozzle directed so as to deliver a stream of air and plaster-forming materials into the path of movement of said impelling means; and means for producing an outward flow of air through the path traversed by said impelling means.

6. A device of the character described for applying materials so as to form a coating, including: a rotary member having a plurality of impelling members thereon; means for driving said rotary member; walls forming a nozzle directed so as to deliver a stream of materials into the path of movement of said impelling members; fluid delivery means within said rotary member for delivering a binder fluid radially outwardly into the path of movement of said impelling members; and means for producing an outward flow of air through the spaces between said impelling members.

7. A device of the character described, for applying materials so as to form a coating, including: a rotary member having a plurality of impelling members thereon; means for driving said rotary member; walls forming a nozzle directed so as to deliver a stream of materials into the path of movement of said impelling members; fluid delivery means within said rotary member for delivering a binder fluid radially outwardly into the path of movement of said impelling members; an external fluid nozzle for spraying a binder fluid inwardly into the stream of air and solid materials issuing from said nozzle; and means for producing an outward flow of air through the spaces between said impelling members.

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