H. D. BABCOCK, F. C. WELLS & J. W. BROWN.

DUST SPRAYING MACHINE.

APPLICATION FILED JAN. 12, 1912.

1,107,015. Patented Aug. 11, 1914.

Fig. 1.

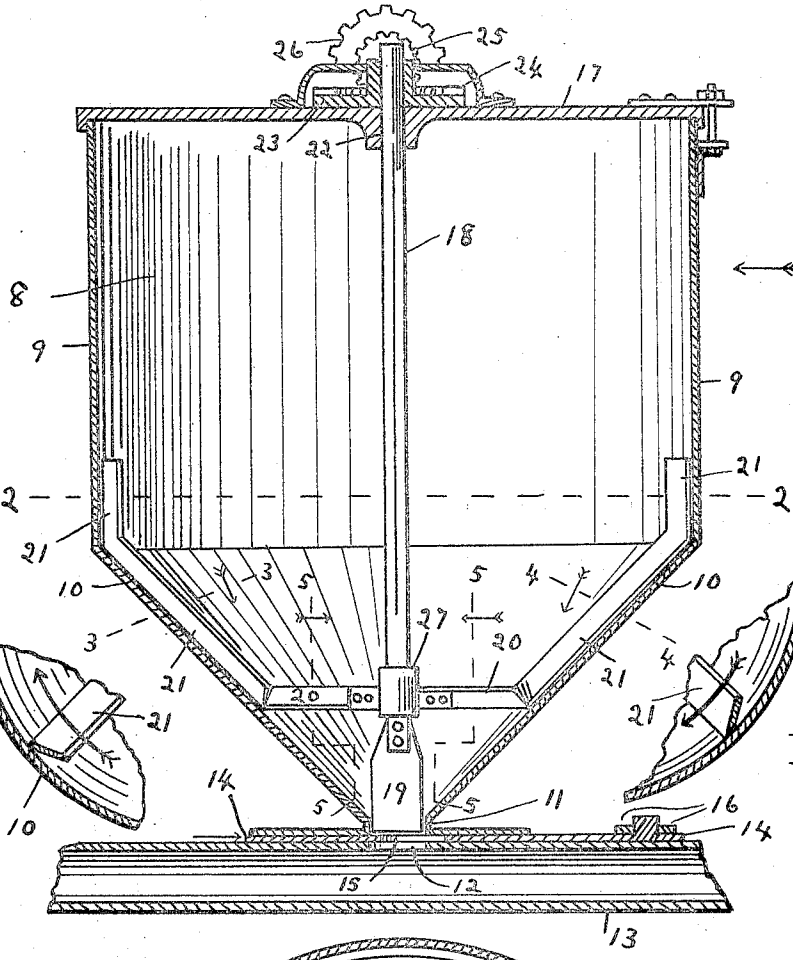


Fig. 5.

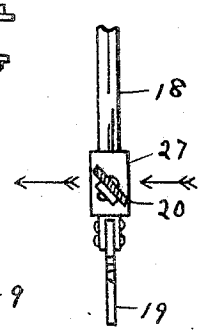
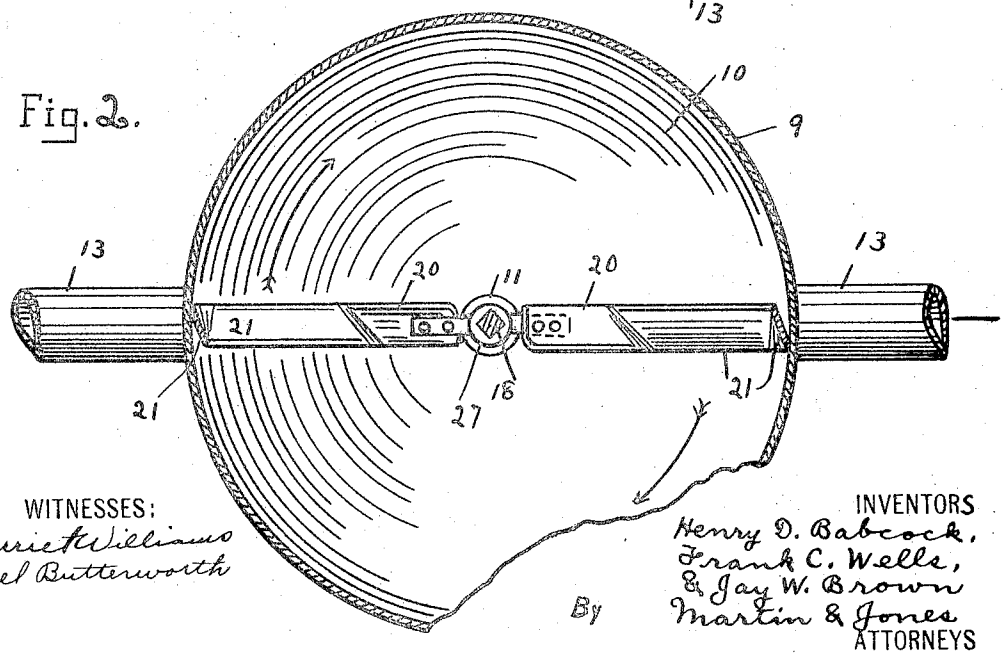


Fig. 3.

Fig. 4.

Fig. 2.



WITNESSES:
Harriet Williams
Ethel Butterworth

INVENTORS
Henry D. Babcock,
Frank C. Wells,
& Jay W. Brown
By Martin & Jones
ATTORNEYS

UNITED STATES PATENT OFFICE.

HENRY D. BABCOCK, OF LEONARDSVILLE, FRANK C. WELLS, OF HOLLAND PATENT, AND JAY W. BROWN, OF RIVER FORKS, NEW YORK, ASSIGNORS TO CHARLES H. CHILDS & COMPANY, OF UTICA, NEW YORK, A CORPORATION.

DUST-SPRAYING MACHINE.

1,107,015. Specification of Letters Patent. Patented Aug. 11, 1914.

Application filed January 12, 1912. Serial No. 670,855.

To all whom it may concern:

Be it known that we, HENRY D. BABCOCK, of Leonardsville, Madison county, FRANK C. WELLS, of Holland Patent, Oneida county, and JAY W. BROWN, of River Forks, in the county of Madison, and all in the State of New York, have invented certain new and useful Improvements in Dust-Spraying Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the reference-numerals marked thereon, which form part of this specification.

The object of our present invention is to provide an improved dust spraying machine of simple construction and effective operation.

Our invention relates to that class of dust spraying machines wherein the powder or dust to be scattered is carried in a receptacle and fed therefrom into a pipe through which is forced a strong current of air which carries the dust along and scatters it in the desired direction. As these machines are used for dusting plants, trees or vines they are usually portable and are commonly made to be operative while being moved past the plants to be dusted. With all substances used in this powdered form, means must be provided in the receptacle for stirring up or agitating the powder. This is necessary because the movement of the machine over the ground and the vibration from the fan or other machinery used to produce the air current, tend to make the powder settle together into a heavy close formation not adapted to being readily fed through a small opening and being then quickly separated into its fine particles by the current of air and held in suspension thereby. Furthermore the agitation must be of a character or supplemented by means adapted to effect a regular or steady supply of the powder. Several of the substances used such as powdered sulfur are found to be particularly difficult to keep in a loose or free state and the machines heretofore used to dust with sulfur or similar powders have been very unsatisfactory in that they failed to keep the powder properly stirred up and failed to effect a steady supply of powder in a sufficiently loose state. To overcome these difficulties is the object of our invention and we effect these improvements by certain features of construction of the agitating and feeding means, and by certain combinations thereof with the receptacle and its outlet which will be now particularly described.

Figure 1 is a perpendicular sectional view of the receptacle and contained or adjacent parts of a dust spraying machine embodying our invention. Fig. 2 is a horizontal sectional view on line 2—2 of Fig. 1. Figs. 3 and 4 are sectional views on lines 3—3 and 4—4 respectively of Fig. 1. Fig. 5 is a perpendicular sectional view on either of the lines 5—5 of Fig. 1.

Referring to the drawing in a more particular description there is illustrated the powder receptacle 8 consisting of an upper portion having a cylindrical wall 9 and a lower portion having its wall 10 tapering or slanting together at the center as it descends in the shape of an inverted cone and having a circular outlet 11 at the bottom.

The receptacle 8 is suitably supported upon the frame work of the dusting machine so as to have its outlet 11 directly over and close to a circular opening 12 in the air pipe 13 through which is forced by any appropriate means (not shown) a strong current of air. Interposed between the outlet 11 and the opening 12 into the air pipe 13 is a sliding gate 14 having an opening 15 therein which may be brought to register entirely with the said outlet and hole and so give the full extent of feed or the gate may be moved as by means of lever 16 so as to partly or entirely close the outlet from the powder receptacle.

Over the top of the receptacle is placed a removable cover 17 from the center of which extends downwardly a revoluble shaft 18 having fixed to its lower end a thin and relatively wide flat perpendicular blade 19. The blade 19 extends into the outlet 11 in the bottom of the receptacle and the width of the blade at that point is substantially the diameter of said outlet 11 or as near thereto as is practical for free rotation therein.

Part way up in the conical portion of the receptacle there are mounted upon a hub 27 fixed to shaft 18 two oppositely extending flat arms 20 extending in a substan-

tially horizontal direction to the opposite sides of the slanting wall 10. These flat arms 20 are bent at opposite angles to each other so that the edges thereof that are to the rear as the arms are revolved are lower than the forward edges, as will be plainly seen in Fig. 5. The purpose of this is that these arms 20 will act, as will be obvious, to press the powder engaged thereby downwardly toward the outlet 11 and thereby act as direct feeding means. It will be understood of course that in operation the shaft 18 and the attached parts will always move in one direction. The direction of such movement is indicated in the drawing by arrows and the angle of the different parts shown in the drawings is such as will be proper assuming the rotation is in the direction indicated.

From the outer ends of pressing arms 20 extend stirring arms 21 which follow the line of tapering wall 10 to its junction with cylindrical wall 9 and also follow said wall 9 upwardly for a part of its height and fit thereagainst as closely as may be without making too great friction when rotated. As will be clearly seen in Figs. 2, 3 and 4, these arms 21 are bent at a reverse angle to that of the arms 20 from which they extend, so that the forward edges of arms 21 are closer to the adjacent walls of the receptacle than the rear edge of the arms. It will be obvious therefore that upon rotation of these arms they will cut the powder away from the walls of the receptacle and that the upper or pendicular portion of these arms will tend to throw the powder toward the center of the receptacle while the lower or oblique portion of the arms 21 will tend to throw the powder obliquely upward and toward the center of the receptacle. These stirring arms 21 will thus periodically cut the powder away from the tapering wall 10 and from the lower part of the perpendicular wall 9 and so prevent the powder from sticking to or caking up thereupon, and will also loosen the whole body of powder by throwing it in the two directions mentioned and letting it fall back again in large measure to its original position. On account of the inclination of the stirring arms the powder will not be pressed together in front of the arms but will slide off to the inner side and for the same reason the powder will have no tendency to stick to the inclined face of the arms but will be cleared therefrom by the motion of the arms. Thus these stirring arms will form agitators effectively keeping the mass of powder in a free or loose state and gently urging it toward the center of the receptacle into a line over the outlet 11 or close enough thereto as to fall that way down the tapering wall 10.

As will be seen from the arrangement of parts as described and particularly from Fig. 2 the pressing arms 20 are located directly below the center of the mass of powder that is kept loosened by the agitating arms 21 and the rotation of these arms 20 periodically cut in between the powder above those arms and its support on that portion of the tapering walls 9 that is below said arms 20, thus further agitating the powder. But the main purpose of these arms 20 is to force the powder therebelow downwardly between the tapering walls 10 toward the outlet 11 by cutting into the lower part of the loosened mass of powder thereabove and forcing it downward by reason of the angle of these arms 20 as already described.

To prevent this forced downward feed from the arms 20 pressing the powder therebelow into a too solid state is one of the purposes of the wide blade 19. As the powder is forced downwardly in an oblique direction from the arms 20 by reason of the inclination of the tapering wall 10 and toward the outlet 11, the inner edge of this obliquely moving mass is engaged by the outer edges of the blade 19 and so again cut or agitated in a direct line above the outlet 11 and so loosened and prepared for a free fall through said outlet. It will also be observed that this blade 19 extends downwardly substantially to the sliding gate 14, so that this last agitating process is continued until the moment the powder is to drop through the opening 15 in said gate and thence into the air pipe 13, thus insuring the powder being dropped into the air current in a loosened state so that it may be thoroughly and easily mixed with the air and so form an efficient, safe and economical dusting mixture. This stright, flat, perpendicular, agitating blade 19 is found to be peculiarly efficient for the last agitating process and has advantages over other forms of agitators heretofore used in that its width is sufficient to agitate the entire mass of powder directly above the outlet, while its flat surface does not press or wedge the powder together by its movement and offers no lodgment for powder but is easily cleared of powder by the downward movement of the powder itself. All these features also assist the blade 19 in its other purpose of forming an efficient means of distributing the powder over the outlet 11 and so getting a regular and steady flow of powder into the air pipe 13 no matter to what extent the gate 14 is moved as long as it is in any open position.

The upper part of shaft 18 is journaled in a suitable bearing 22 in the center of the cover 17 and has its end extended therethrough and equipped with means for rotating said shaft and its attached parts. Such means may be a gear wheel 23 secured

to said upper end of the shaft and having teeth 24 to be engaged by a pinion 25 which in turn is mounted on a shaft with a driven sprocket wheel 26 extending over the farther edge of the cover 17 as viewed in Fig. 1.

What we claim as new and desire to secure by Letters Patent is:

1. The combination in a dust spraying machine of a powder receptacle, an air pipe below said receptacle, an outlet connecting said receptacle and the air pipe, a perpendicular shaft centrally located and revolubly mounted in said receptacle, arms projecting horizontally from said shaft to the walls of the receptacle and extending upwardly along the contour thereof, the horizontal portions of said arms being downwardly inclined toward their rear edges and adapted to yieldingly feed the powder downwardly toward the opening and the upwardly extending portions of said arms having their forward surface rearwardly inclined as they leave the side walls and adapted to urge the powder toward the center of the receptacle and means for rotating said shaft.

2. The combination in a dust spraying machine of a powder receptacle, a removable cover for said receptacle, an air pipe below said receptacle, an outlet connecting said receptacle and air pipe, a perpendicular shaft journaled only in said cover and extending downwardly in said receptacle, arms projecting horizontally from said shaft to the walls of the receptacle and extending upwardly along the contour thereof, the horizontal portion of said arms being downwardly inclined toward their rear edges and adapted to yieldingly feed the powder downwardly toward the opening and the upwardly extending portions of said arms having their inner edges inclined rearwardly and adapted to urge the powder toward the center of the receptacle and means for rotating said shaft.

In witness whereof we have affixed our signatures, in the presence of two witnesses, this 28th day of Dec. 1911.

HENRY D. BABCOCK.
FRANK C. WELLS.
JAY W. BROWN.

Witnesses to signatures of Henry D. Babcock and Jay W. Brown:
FLOYD M. CROOP,
I. A. BABCOCK.

Witnesses to signature of Frank C. Wells:
HARRIET WILLIAMS,
ETHEL BUTTERWORTH.