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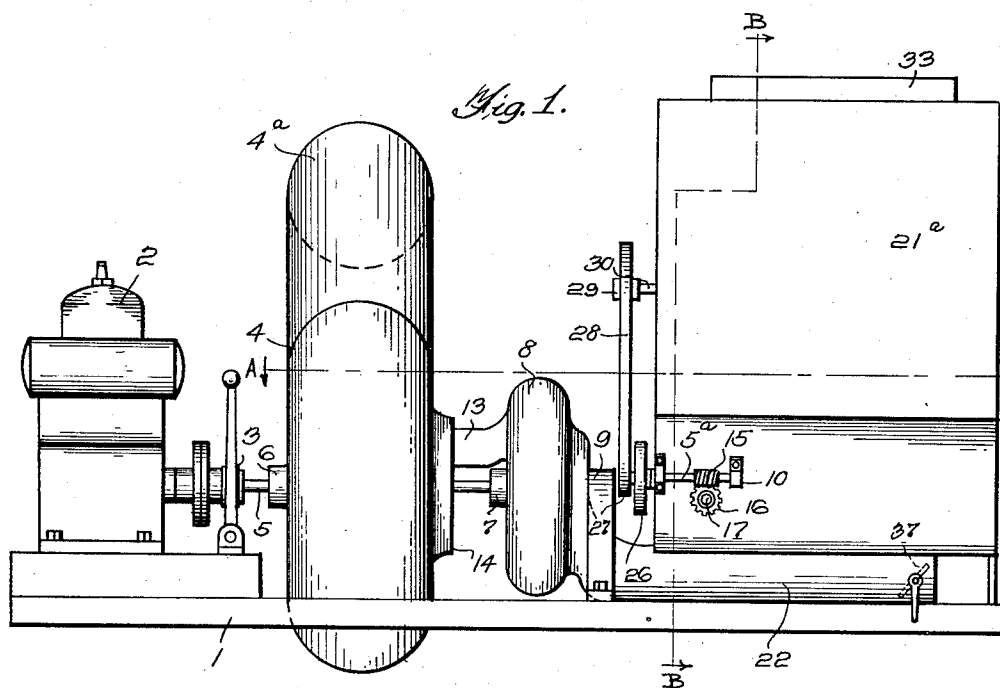
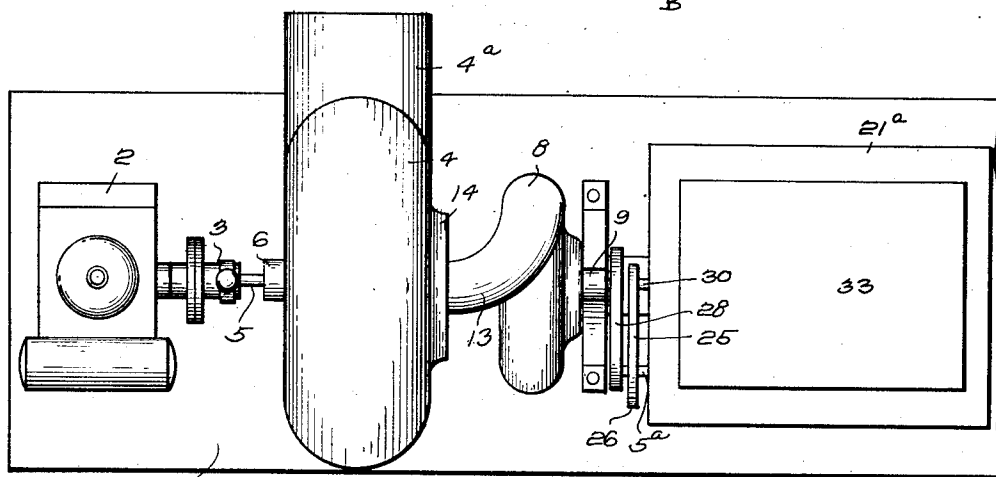
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DUAL FAN DUSTING MACHINE

Filed March 7, 1929

2 Sheets-Sheet 1



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Fig. 3.

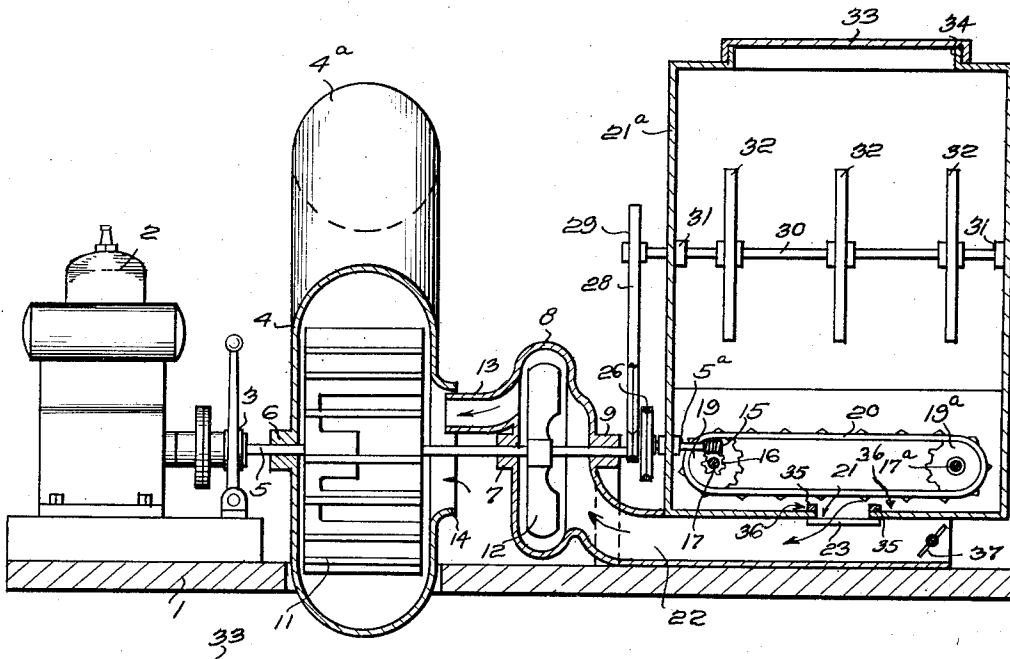
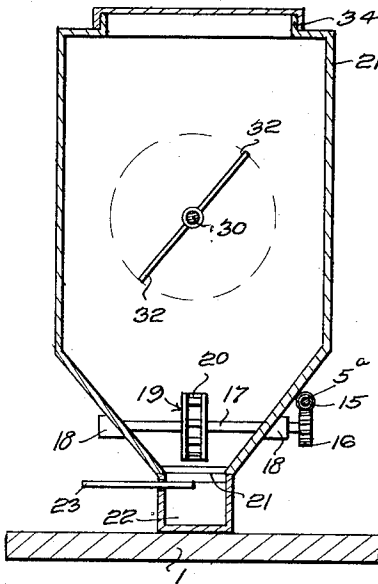


Fig. 5.

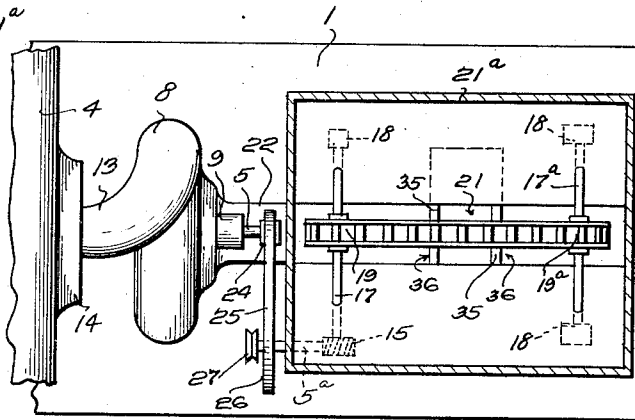


Fig. 4.

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DUAL FAN-DUSTING MACHINE

Application filed March 7, 1929. Serial No. 345,211.

This invention relates to agricultural dusting machines, and particularly agricultural dusting machines of a type designed to scatter insecticides or fungicides broadcast over the area of vegetation.

One of the primary objects of the invention is to provide an apparatus whereby such materials in powdered form may be uniformly and controllably fed from a material container into the suction side of an exhaust fan without diminishing the exhaust power of the fan by calling upon it to move the material out of the hopper and feeding the mechanism by the use of suction.

A further object of the invention is to feed into such exhaust fan the powdered material thoroughly disintegrated and mixed with air.

A further object of the invention is to provide a material container equipped with feeding means of such character as to retain in the container foreign substances which may be inadvertently mixed with the materials.

A still further object of the invention is to provide a container from which materials will not be wasted under conditions of normal use and from which materials may be fed with a minimum of attention from the operator.

It is well known by persons skilled in the art that a given fan of the exhaust type, the impeller of which is rotating at a given speed, with other conditions being equal, will be greatly reduced in its power to exhaust air if called upon to exert a part of its power by creating suction; and it being greatly desirable to have exhaust fans on dusting machines deliver maximum efficiency in the discharge of a proper mixture of materials and air over the area of vegetation being treated.

It is also known that greater efficiency and more uniform distribution of the powder over the area being treated may be obtained when the materials are thoroughly broken up and disintegrated and intermixed with a proper volume of air before introduction of said mixture into the exhaust fan, and to the accomplishment of this purpose we have invented a novel means herein disclosed which may be readily understood by those skilled in

the art from the following description together with the accompanying drawings in which;

Figure I is a side elevation without supporting trucks.

Figure II is a top plan view.

Figure III is a vertical sectional view taken on line A—A, of Figure I.

Figure IV is a sectional view of the material container looking down along line A—A of Figure I.

Figure V is a vertical section of the material container along line B—B of Figure I.

In the several figures like references designate like parts.

1 is a framework on which the material container, exhaust fan and other essential parts of the apparatus are mounted. No trucks or supporting wheels are shown beneath the framework as any conventional means of transportation of the machine from place to place and while in operation may be utilized, such as a suitable pair of wheels mounted upon the axle underneath the frame of the machine; and it may be drawn from place to place, or while in service, by any suitable power, such as a farm tractor or team; likewise the machine may be mounted onto an ordinary motor truck and thereby transferred from place to place and while in use. The means of mounting or transportation constitutes no part of our invention. No further specific reference thereto is deemed required.

2 is an engine of any conventional type, commonly referred to as a gasoline motor. 3 is a clutch for connecting motor 2 to shaft 5 which shaft passes through exhaust fan housing 4, being supported at bearing 6 therein and extending through bearing 7 in auxiliary suction fan 8, thence through bearing 9 in the intake housing of the auxiliary fan 8, more clearly shown in Figure III. Shaft 5 has impeller 11 mounted to rotate therewith within the housing 4, thus providing means for exhausting the mixture of powder and air through exhaust opening 4a. Shaft 5 also has mounted thereon and rotating therewith impeller 12 designed to rotate within housing 8, thus creating suction which is

discharged through conduit 13 into the intake opening 14 of the exhaust fan, the purpose of which will be more fully described herein. Shaft 5 on its extension through bearing 9 carries V faced pulley 24 by which rotation is imparted through belt 25 to pulley 26 which latter is mounted upon auxiliary shaft 5a. Worm 15 on shaft 5a engages with worm wheel 16 which latter is secured to shaft 17 and imparts rotation thereto when the motor is running and clutched to shaft 5 by clutch 3. 17a is a shaft parallel to shaft 17, the pair of shafts being mounted in bearings 18. Secured to shaft 17 is sprocket 19 and upon shaft 17a is rotatably mounted sprocket 19a. About sprocket 19 and 19a chain 20 is mounted to be driven so as to move the material in the container across the bottom thereof and over opening 21 in the bottom of container 21a through which the material is discharged into conduit 22 where it is transmitted by movement of a current of air therethrough and through auxiliary fan 8, conduit 13 and discharged into fan 4 through opening 14.

Gate 23 is provided for controlling the opening 21 in such manner as to regulate as desired the quantity of material passing through opening 21 into conduit 22.

Pulley 27 is mounted on shaft 5a which upon being rotated imparts through belt 28 rotation to pulley 29 mounted upon shaft 30, which rotates in bearing 31—31, and carries so mounted as to rotate therewith agitators 32, shown in Figures III and V, the purposes of which are to break up the material in container 21a and dislodge from the walls of the container any material having a tendency to adhere thereto and cause the same to be precipitated into the area in the bottom of the container in which sprockets 19 and chain 20 are disposed. 33 is a cover for opening 34 in container 21a through which opening 34 material may be charged into the container. 35—35, Figure III, is a ledge about opening 21 providing space 36—36 adjacent opening 21 for pocketing foreign substances entering the container 21a, thus preventing their discharge through opening 21 into conduit 22 and therethrough into suction fan 8 and exhaust fan 4.

37 is a butterfly valve whereby the opening in conduit 22 may be regulated for the entrance of air to conduit 22 and therethrough into auxiliary suction fan 8. While we have shown this butterfly valve at the normal open end of conduit 22 and have shown opening 21 in container 21a as between butterfly valve 37 and suction fan 8 for the obvious reason that such position is the preferred relation of the parts, since upon the partial closing of the opening in conduit 22 by butterfly valve 37 suction is intensified on the material entering from container 21a through opening 21 which action tends to accomplish two beneficial pur-

poses, one of which is to aid in the extraction of the material from the container.

The greater reason however is that the material passing through conduit 22 intermixed with currents of air under suction disintegrates or separates into its various minute particles more readily and more completely than would occur were it not subjected to such action.

The simple operation of our machine is as follows:

Upon the machine being mounted upon a pair of wheels or motor truck, or other suitable means of conveyance, gasoline engine 2 is started. Cover 33 is removed from material container 21a and suitable charge of material to be distributed is deposited in the container. Gate 23 is adjusted over opening 21 so as to control the amount of material to be discharged through opening 21 from the container into conduit 22 as desired. The motor is then clutched to shaft 5 and fan 4 begins to exhaust air at its maximum efficiency, opening 14 in said fan being of sufficient dimension as to offer the minimum or no restriction for the entrance of air into fan 4, said fan 4 being designed to produce no suction and its maximum efficiency in the exhaust; fan 8 being designed to create within conduit 22 suction of the greatest possible efficiency of said fan, thus moving materials which may be discharged through opening 21 into conduit 22 through the latter and through fan 8 and discharge or exhaust the same through discharge conduit 13 into opening 14 of exhaust fan 4. Chain 20 traveling over opening 21 will continually move the material over said opening, thus maintaining a constant feed. Heavy particles of foreign matter in the material find lodgement within the space 36, about ledge 35, about opening 21, and may be removed at a convenient time after the operation has ceased.

Agitators 32 serve to thoroughly break up and keep in motion the materials in the container and prevent the same from settling into a condition of compactness which would tend to cause its lodgement upon the walls of the container and to be precipitated into the bottom of the latter about the opening 21 unevenly, for correction of which agitators 32 are employed.

Gate 23 is, of course, readily adjusted while the machine is in operation.

The arrangement of our auxiliary or suction fan and suction conduit for moving the material from the discharge opening in the container under regularly or controlled suction (i. e. partial vacuum) accomplishes a most desirable result in that materials in passing through this conduit, intermixed with a moving current of air, under suction respond favorably to the desired result in that a disintegration or separation of the particles of material takes place, which ac-

tion is greatly aided by passing through auxiliary fan 8 and being discharged into the intake side of exhaust fan 4 in a most thoroughly disintegrated condition of the powder, and most thoroughly mixed with the air. The discharge through conduit 13 being only of such reasonable force as to properly project the mixture of material and air into the intake opening of exhaust fan 4, which latter is designed to exhaust to maximum efficiency, hence discharges the mixture into the atmosphere freely over the area to be treated.

Any suitable means, such as an extension exhaust conduit with an elbow, may be used to direct exhaust from the exhaust opening 4a, as desired, into the normal wind currents whereby the mixture of material and air is conveyed further over the area of vegetation than would be propelled by discharge from fan 4 alone.

Since the materials of the general character of commercial insecticides and fungicides tend to adhere together while in storage, or after being deposited in the container of dusting machines, it becomes readily apparent that we have provided novel and efficient means for breaking up the material in the container. The chain 20 runs about sprockets 19 and 19a in one direction over the discharge opening and in the opposite directions above the first. This prevents an accumulation, or banking, of materials in excess of the amount discharged at one point in the container and keeps the material in the container in agitation or motion. Also the agitators 32 revolve about the axis of shaft 30 and thereby create a movement of the material above the movements caused by the chain and transversely thereof. Such agitation of the material in the container prepares and maintains it in the most desirable condition for uniform discharge.

Having thus described our invention, what we claim is:

1. In a dusting machine the combination of an exhaust fan, a suction fan adapted to discharge into the intake side of said exhaust fan, means for controlling the intensity of suction into said second named fan, a material container, and means for controllably discharging materials from the container into the suction area of said second named fan.

2. In a dusting machine material container, a discharge opening in the container, means for moving material across the bottom of the container and over the opening, means for moving materials in the opposite direction of said first named movement, means above the first named area of movement for moving materials transversely thereof.

3. In a dusting machine material container, a discharge opening in the container, means for moving material across the bottom of the container and over the opening,

means for moving materials in the opposite direction of said first named movement, means above the first named area of movement for moving materials transversely thereof and means adjacent the area of the first named movement and the discharge opening for receiving foreign substances and preventing their discharge through said opening.

In testimony whereof we affix our signatures.

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