Sept. 9, 1941. H. J. KEMP 2,255,468

ROTARY GRAIN DUSTING MACHINE

Filed Oct. 10, 1938 2 Sheets-Sheet 1

FIG. 2.

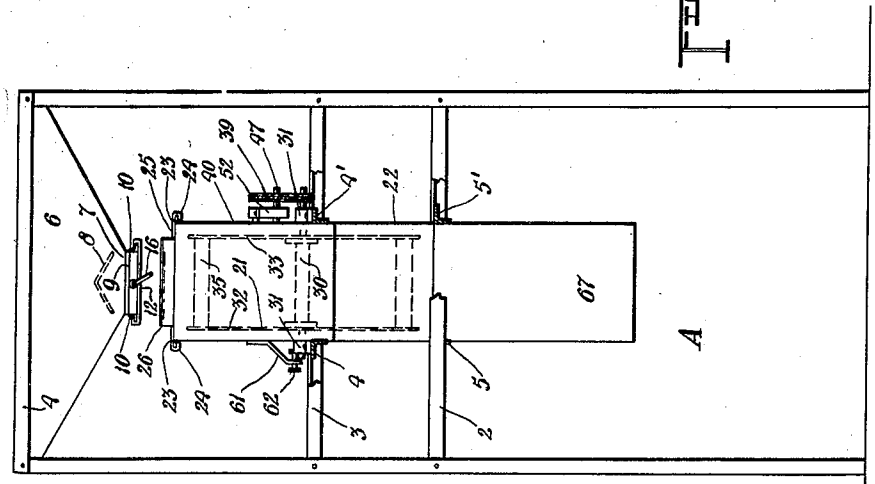
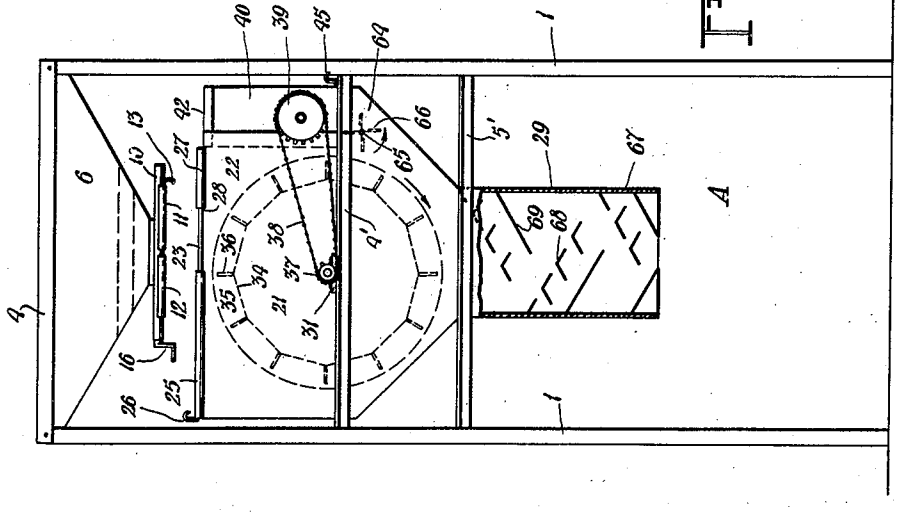



FIG. 1.




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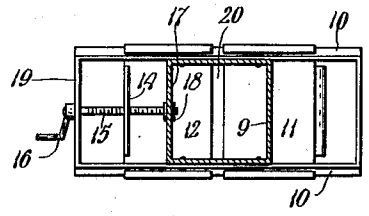



Fig. 3.

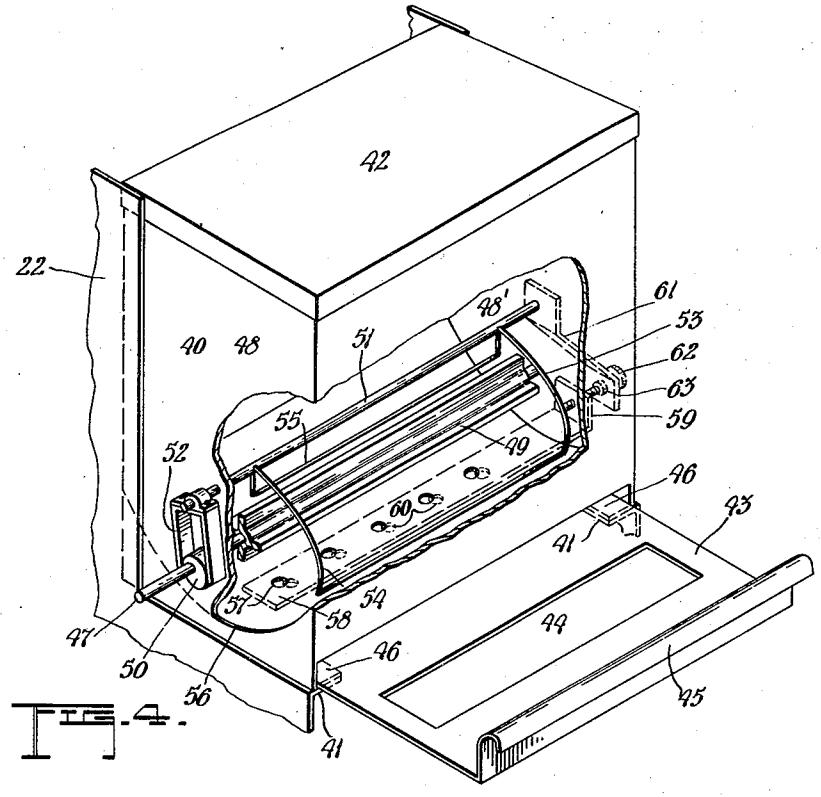



Fig. 4.

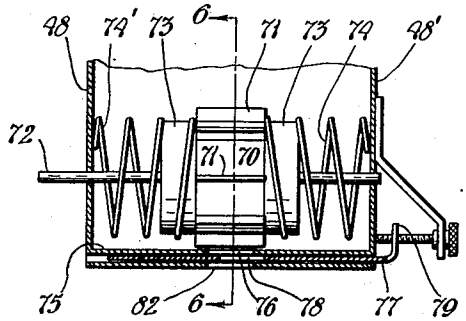



Fig. 5.

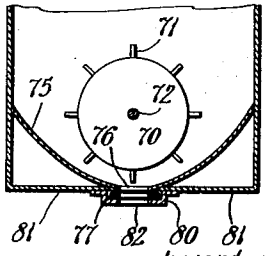



Fig. 6.

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# UNITED STATES PATENT OFFICE

2,255,468

## ROTARY GRAIN DUSTING MACHINE

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Application October 10, 1938, Serial No. 234,268
In Canada October 28, 1938

3 Claims. (Cl. 83—28)

This invention relates to improvements in grain dusting machines and an object of the invention is to provide a device of the character herewithin described which is entirely automatic in action, power for the operation of intimately mingling the seed grain with organic mercurial dust being obtained by the gravitation of the grain from the hopper and through the machine.

A further object of my invention is to provide a device of the character herewithin described which provides for a rotating fan or paddle wheel, the same being actuated by falling grain, the purpose of same being further to disperse the dust which is discharged from the dust dispenser above and so mingle it with air and thus effect a more complete and more uniform contact of grain with dust.

A further object of my invention is to provide a device of the character herewithin described which is equipped with means for automatically measuring successive quantities of seed grain and chemical dust.

A further object of my invention is to provide a device of the character herewithin described which is equipped with a rotor divided into a number of peripheral compartments, to each of which a quantity of grain falls from the hopper, thereby rotating the rotor.

A further object of my invention is to provide a device of the character herewithin described wherein the rotor shaft rotates my chemical dust agitating and discharging mechanism.

A further object of my invention is to provide a device of the character herewithin described which is provided with means for varying the quantity of grain discharged from the hopper and means for cutting off the supply of grain from the hopper.

A further object of my invention is to provide a bridge within my main delivery hopper to take the weight of the grain thereabove so that the momentum of the discharge will be the same for a small quantity of grain within the hopper as for a large quantity.

With the above more important objects in view, and such other minor objects as may appear as the specification proceeds, my invention consists essentially in the arrangement and construction of parts all as hereinafter more particularly described, reference being had to the accompanying drawings, in which:

Fig. 1 is an elevation of my machine taken from one side thereof.

Fig. 2 is an elevation of my machine taken from one of the two sides at right angles to the side illustrated in Figure 1.

Fig. 3 is a plan view of my hopper discharging mechanism.

Fig. 4 is a perspective illustration of my dust container and dust agitating and discharging mechanism.

Fig. 5 is a sectional elevation of an alternative mechanism for discharging dust from my dust container.

Fig. 6 is a section upon the line 6—6 of Figure 5.

In the drawings like characters of reference indicate corresponding parts in the different figures.

My rotary seed grain dusting mechanism is mounted within a framework A consisting essentially of four corner verticals 1 suitably braced by horizontal angle bars 2, 3 and 4, extending between each of the two pairs of verticals 1 and further angle bars 4 and 4', 5 and 5' which extend between the members 2 and 3 and are secured at their ends thereto.

At the apex of the framework and extending downwardly therebetween being secured to the verticals 1, is my hopper 6, the hopper being supplied near the exit aperture 7 thereof with a bridge 8 of the configuration clearly shown in Figures 1 and 2 of the drawings accompanying this application to take the weight of the grain within the hopper.

Extending around the exit aperture of my hopper is a rectangular flange 9, the exit aperture being also rectangular. To two of the opposite sides of the flange 9, I secure a pair of angle tracks 10 slidable along which are flanged plates 11 and 12. The plate 11 is provided at its outer end with a downturned portion 13 which serves as a hand grip for moving it along the tracks 10 while at the outer end of the plate 12, I provide an upturned portion 14 provided with a central tapped orifice through which extends a screw threaded shank 15, at the outer end of which is a handle 16.

The inner end of the shank rotates within an aperture formed centrally upon the side 17 of the flange 9, collars 18 being provided to prevent end-shiftable movement of the shank 15 through the side 17. The outer end of the shank 15 passes through an aperture formed in a cross member 19 which spans the ends of the angle tracks 10, the handles 16 being keyed to the shaft upon the outer side of this member.

From the foregoing, it will be seen that the detail just described permits of manual adjust-

ment of the size of the aperture 20 through which grain from the hopper 6 may pass as the plate 12 will be moved to left or right upon rotation of the handle 16 while the plate 11 can be drawn to left or right manually.

Furthermore, by the means just described, the aperture 20 may be adjusted to the requisite amount to the right of top dead centre of the rotor 21 with respect to Figure 1 of the drawings accompanying this application to carry out the operation later to be described.

The means by which grain in my hopper is initially opened up and the mass scattered for dusting is the element 21 in the form of a rotor which is contained within a large rotor housing 22 of the configuration clearly shown in Figures 1 and 2 of the drawings accompanying this application, the top edges of the housing being provided with flanges 23 around which extend mating flanges 24 of a slidable cover 25, the cover being provided at one end with a handle 26 for the purpose of effecting manual sliding movement. The cover portion 27 of my rotor housing is generally made integral with the housing itself although the same may be slidable if desired and in connection with this portion, it will be noted that the edge 28 thereof is considerably offset with respect to top dead centre of my rotor.

Below my rotor housing is my mixing and discharge chamber 29, the rotor housing and discharge chamber being secured to the angle irons 4, 4' and 5, 5'. The main spindle 30 upon which my rotor turns is journalled in bearings 31 secured to the members 4 and 4'. The rotor itself consists of a pair of polygonal plates 32 and 33, a cover extending all around the periphery of each plate, one edge of the cover being secured to the peripheral edge of each plate so that the rotor is enclosed and is in fact practically a cylinder. Each of the flattened portions 34 of the periphery of the rotor are formed into compartments 35 by the provision of short upstanding walls 36 radiating from the centre of the rotor and from the foregoing, it will be seen that as grain gravitates downwardly through the exit aperture 7 of the hopper 6, the rotor will turn in a clockwise direction with respect to Figure 1 of the drawings accompanying this application due to the fact that the aperture is set to the right of top dead centre of the rotor.

Upon the outer end of the shaft 30, I provide a sprocket 37, said sprocket being keyed to the shaft, a sprocket chain 38 passing around the sprocket and proceeding around a larger sprocket 39. The right hand upper portion of my rotor housing 22 is cut away as shown most clearly in Figures 1 and 4 of the drawings accompanying this application to receive a dust container 40, the dust container resting upon brackets 41 formed if desired, out of a portion of the wall of the rotor housing. My dust container is provided with a removable cover 42 and is provided with a sliding plate 43 at its base, this plate being formed with an elongated rectangular aperture 44 and a convenient handle 45 for manual sliding movement. The plate 43 slides upon flanges 46 through which the mercurial organic dust or other chemical dust falls in the manner later to be described.

The sprocket 39 is keyed to a shaft 47 which extends through the side walls 48 and 48' of my dust container, being journalled therein and upon this shaft, is mounted for rotation an elongated four-sided paddle 49 of the configuration clearly illustrated in Figure 4 of the drawings accompanying this application. An eccentric cam 50 is secured upon the shaft upon the outer side of the side wall 48 and above the shaft 47 and also extending through the side walls 48 and 48' and journalled thereupon, is a secondary shaft 51. Upon the outer end of this shaft is a yoke 52, the ends of which engage with the cam 50 from which it will be seen that as the shaft and consequently the cam rotate, the shaft 51 will be oscillated.

Attached to the shaft within the container and extending over the paddle 49, I provide a wire agitator 53 of the configuration clearly illustrated in Figure 4 of the drawings accompanying this application and as the shaft 51 oscillates in the manner previously described, it will be clear that this agitator will move through a small arc both with respect to the portions 54 and 55 thereof.

The interior of my dust container is provided with a semicircular false floor 56, the false floor being provided with a number of aligned perforations 57 through which dust may fall through the aperture 44 in the plate 43 when the same is thrust inwards, and below the false floor portion 56, I provide a sliding element 58 angled upwardly at its outer end as at 59 for the purpose of metering the dust through the apertures 57, the element 58 consisting of a strip of flat bar provided with a plurality of aligned apertures 60 of the same size as the apertures 57 and arranged immediately therebeneath.

A bracket 61 is secured upon the outer surface of the side wall 48' extending outwardly and downwardly and being provided at the lower outwardly projecting end with a set screw 62. The set screw is free to rotate in the aperture formed in the base of the bracket 61 being prevented from end-shiftable movement at this end by a collar 63, the upturned portion 59 of the element 58, however, being provided with a tapped orifice through which the shank of the set screw extends, from which it will be obvious that as the set screw is turned, the element 58 will be moved to the right or left so that the apertures 60 therein may be moved into or out of vertical alignment with the apertures 57.

Journalled in the side walls of the rotor housing, in the outwardly projecting portion 64 immediately below the dust container 40, is a shaft 65 which rotates a set of vanes 66, the right hand vane when in horizontal position being immediately below the line of apertures 57 so that dust falls onto them from the dust container. These vanes, however, are rotated in an anti-clockwise direction due to the flow of grain upon the left hand paddle with respect to Figure 1 of the drawings accompanying this application and as this member is rotated rapidly, it will be seen that dust is flung in a trajectory upwardly and to the left so that it mingles intimately with the grain falling from the compartments 59 at this point. The grain now proceeds on downwardly through my mixing and discharge chamber 29 which is generally of rectangular configuration consisting of four vertical side walls 67.

A number of baffles in the form of staggered bridges 68 and chuting plates 69 extend across within this chamber between the side walls thereof, the arrangement of these baffles being clearly illustrated in Figure 1 of the drawings accompanying this application, this being in my opinion, the arrangement of baffles and plates which most effectively completes a thorough ad-

mixture of dust with the grain before it discharges into a bag or upon the floor below the discharge chamber.

In Figures 5 and 6 of the drawings accompanying this application, I have illustrated a slight modification in my means for agitating the dust within the container 40 and for preventing "bridging" therein, and in this case, I am able to dispense with the cam 50, the shaft 51 and the yoke 52, the paddle 70 in this embodiment being comparatively narrow and provided with a plurality of short radiating blades 71 upon its periphery.

The paddle is, however, secured to a shaft 72 which is rotated by the same means as the shaft 47 and it will be noted by reference to Figure 5 of the drawings accompanying this application, that upon either side of the paddle proper, I provide cylindrical extensions 73 around which extends a plurality of wire or light metal spiral elements 74 and 74', each of these two elements being opposed with respect to the direction of spiral. The end of each spiral is secured either upon the periphery of the portions 73 or to the outer ring formed by the side of the paddles 70 and each element extends outwardly to the wall 48 and 48'.

In this embodiment, the container is formed with a floor-portion 75 which may or may not be of semicircular configuration, an aperture 76 being provided therein immediately below the paddle. A sliding element 77 provided with an aperture 78 capable of alignment with the aperture 76, extends beneath the floor 74, this element being provided with an upturned end portion 79 and capable of actuation by a similar means to that described for actuation of the element 58 in connection with the embodiment illustrated in Figure 4 of the drawings accompanying this application.

By inspection of Figure 6 of the drawings accompanying this application, it will be seen that the element 77 is held in place by means of an elongated and angulated base plate 80 secured to the base portion 81 of the container, the portion 80 being provided with an aperture 82 in vertical alignment with the aperture 76.

From the foregoing, it will be seen that I have provided a device for the intimate admixture of chemical dust with seed grain whereby the flow of the grain downwardly through the hopper actuates a metered dust supply in a simplified, ingenious and adjustable manner and by means of which the various parts may be easily cleaned.

Since various modifications can be made in the above invention, and many apparently widely different embodiments of same, made within the scope of the claims without departing from the spirit and scope thereof, it is intended that all matter contained in the accompanying specification shall be interpreted as illustrative only and not in a limiting sense and I desire only such limitations placed thereof as are specifically expressed in the accompanying claims.

What I claim as my invention is:

1. A machine for coating with dust the constituents of a granular mass of material comprising in combination, a mounting structure, a hopper having a gravity discharge aperture therein and designed to contain said granular mass positioned at the apex of said mounting structure, a rotatable mass scattering element below said hopper, a dust container provided with a dust discharge aperture adjacent the periphery of the scattering element, dust dispensing mechanism within said container and a rotatably journalled dust dispersion member adjacent said mass scattering element and below said dust discharge aperture, the gravity discharge aperture being horizontally offset towards the dust container with respect to a vertical line through the axis of the mass scattering element, said granular mass being free to gravitate through said gravity discharge aperture and by its weight actuate said mass scattering element towards said dust dispenser, dust dispersed by said dust dispersion member commingling with, and coating the granular mass scattered by said element.

2. A machine for coating with dust the constituents of a granular mass of material, comprising, in combination, a framework, a hopper secured to the apex of said framework, a housing secured to said framework below said hopper, a rotor within said housing below said hopper and designed to be rotated by the gravitation of grain from said hopper thereonto, said rotor consisting of a 2-flanged drum having a multiplicity of shallow, radial partitions extending between said flanges to form a multiplicity of material receiving compartments, a dust container and dust dispensing mechanism associated therewith adjacent said rotor, said dust dispensing mechanism extending into said container, means for actuating said dust dispensing mechanism upon the rotation of said rotor and a rotatably journalled dust dispersion member adjacent said dust container.

3. A machine for coating with dust the constituents of a granular mass of material, comprising, in combination, a framework, a movable mass scattering element mounted within said framework, a housing surrounding said element and a dust container having a discharge aperture, a freely journalled multi-bladed dust dispersion member rotated by material scattered by said element, said member being positioned adjacent the discharge aperture of said container, dust being precipitated upon the rotating blades of said member as the same is being rotated, to commingle with, and coat with dust, material scattered by said element.

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