Nov. 22, 1938. C. D. COLLINS 2,137,526

PUMP DUSTER

Filed June 20, 1936

Fig. 1.

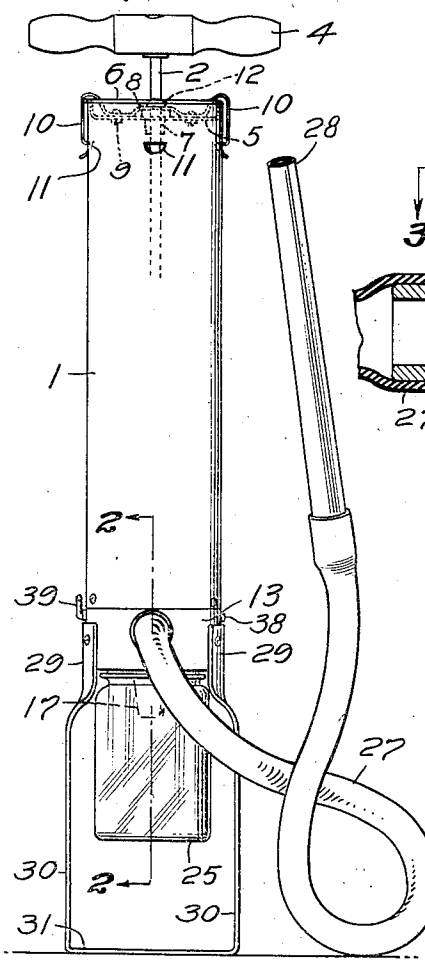


Fig. 2.

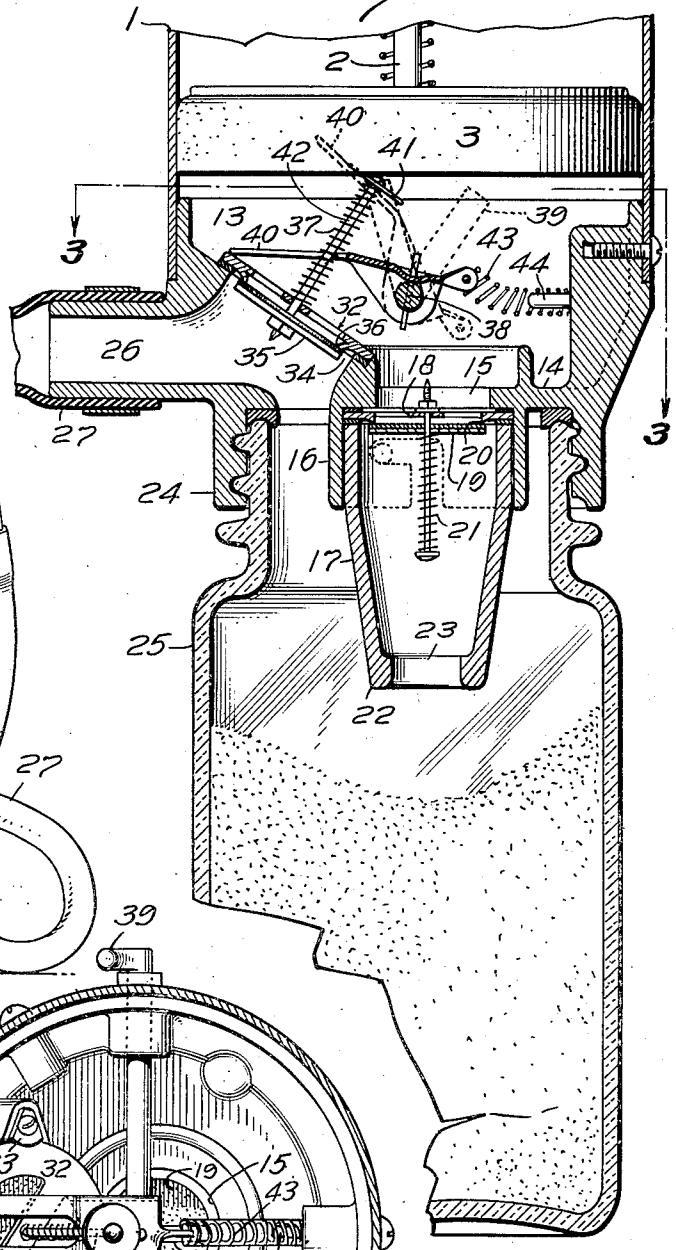
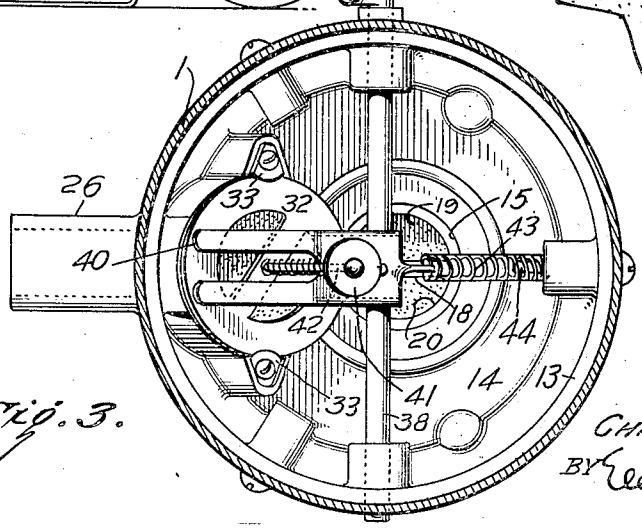


Fig. 3.



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PUMP DUSTER

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7 Claims. (Cl 43—147)

This invention relates to a device for ejecting or dusting powdered material by means of air.

The principal objects of the invention are to provide a simple, compact device which may be readily operated in an efficient manner and which will adapt itself to ease of manufacture.

While the invention is primarily adapted for the distribution of a dusting material in the form of a fumigant, yet obviously the invention is not to be limited thereto as any desired powdered or dust material may be conveniently distributed by the device of this invention.

To this end the invention contemplates the provision of air supplying means conveniently shown in the form of a pump, to the lower portion of the barrel of which is secured a fixture, carrying a readily detachable dusting material container at the bottom thereof. The fixture itself is provided with a central apertured wall through which the air moves under impulse of the pump plunger, and the bottom of this wall carries an integral depending skirt. Within the skirt there is detachably held a nozzle and between the nozzle and the wall of the fixture is located a one-way valve, preferably spring actuated to prevent the movement of air and entrained dusting material into the pump barrel.

It has been found that this nozzle may conveniently take the form of a tapered element having the tip thereof formed with an inwardly projecting flange. This flange causes turbulence of the air passing through the nozzle and serves to cause a maximum amount of dusting material to be picked up by the air passing therethrough. The air and entrained dusting material is ejected through a port in the side of the fixture which may contain a perforated pipe as in other dusters, and a flexible hose or other device may be provided for directing the dusting material to the desired point.

The invention further contemplates the provision of a dust cut-off valve within the device manually operable from the outside thereof, whereby air may be passed either through the dust container alone, through the exit duct without passing through the dust container, or through both at will.

The invention further consists in the novel arrangement, combination and construction of parts more fully hereinafter described and shown in the accompanying drawing.

In the drawing:

Fig. 1 is a side view of a device embodying the invention;

Fig. 2 is a sectional elevation along the line 2—2 of Fig. 1;

Fig. 3 is a transverse sectional view along the line 3—3 of Fig. 2.

Referring to the embodiment illustrated I have shown a pump barrel at 1 to comprise a cylindrical element of the desired size within which operates the usual rod 2 carrying a plunger 3 thereon and having a handle 4. Within the top of the pump barrel 1 a dished cap 5 is provided which seats as at 6 on the top rim of the pump barrel. The rod 2 passes through an aperture in the cap 5 and a bushing 7 of wood or other desired material is provided between the rod and the cap. A spring clip 8 overlying the bushing 7 is detachably secured to the cap as by means of bolts 9 and then is bent over the top of the pump barrel and down the sides thereof to form fingers 10 which detachably engage holes 11 in the barrel side. An enlargement 12 is provided on the rod 2 to prevent the plunger from moving too far down in the barrel. To the bottom of the pump barrel a fixture 13 is secured which effectively closes the barrel. This element 13 has a central wall 14 containing an aperture 15 therein through which air moves under impulse of the plunger 3.

On the bottom of the wall 14 there is formed a depending skirt 16 into which is detachably secured a nozzle 17 as by means of a bayonet joint connection. Between the top of the nozzle 17 and the bottom of the wall 14 there is located a valve frame work 18 having a valve proper 19 movable upwardly against the seat 20 under impulse of the spring 21. Suitable gaskets are provided between the valve framework and the fixture as well as between the valve framework and the nozzle.

The nozzle 17 is provided with a tapered portion which terminates in a restricted tip 22 on the interior of which is located an inwardly projecting flange 23. The presence of this flange causes turbulence of air as it passes through the nozzle and insures the picking up of a maximum amount of dusting material.

To an outer depending flange 24 on the fixture 13 there is detachably secured, as by coarse threads, a dusting material container 25 which may conveniently take the form of a glass jar although I do not wish to be limited to this instrumentality.

Above the jar 25 and at one side of the skirt 16 an exit port 26 is located through which the air and entrained dusting material is ejected into a flexible hose 27 and distributing tube 28.

Also secured to the fixture 13 and to the outside thereof is a strap 29 having side portions 30 which extend downwardly on each side of the container 25 and beneath the same to form a foothold 31. Sufficient room is provided between the foothold 31 and the bottom of the container 25 so that an operator may conveniently place his foot thereon when operating the device. It is to be noted that the strap forming the foothold at the same time effectively protects the glass container from accidental injury.

The wall 14 is also provided with a dust cut-off valve comprising a frame work 32 secured as by members 33 over aperture 34 with valve 35 adapted to engage against seat 36 on the frame work 32 under impulse of spring 37. This spring is substantially weaker than spring 21 above referred to.

A dust cut-off operating shaft is shown at 38 passing completely through and journaled in the fixture 13, terminating at one end in a handle 39 on the outside of the dusting device. This shaft 38 carries a forked member 40 rotatable therewith, which in the "off" or upper position engages the stop 41 on the end of the spindle 42 which is attached to the valve 35. In this position the valve 35 cannot be opened under impulse of air from the pump. In the "on" or downward position, the forked member 40 rests against the frame work 32 and thus the valve 35 is free to operate. A spring 43 extending between the forked member 40 and a boss 44 on the fixture 13 serves to hold the forked member 40 and consequently the cut-off lever handle 39 in either the "off" or "on" position.

In operation, and assuming it is desired to deliver a mixture of dust and air rich in the former, the handle 39 is moved to the "off" position. In this position, the valve 35 is closed against operation. Air from the pump thus passes into the dust container 25 by reason of the opening of valve 19, picks up the dust and delivers it to the discharge hose 27. Upon moving the handle 39 to the "on" position, the valve 35 is free to operate. A normal down stroke on the handle 4 of the pump will deliver air only through valve 35 inasmuch as its spring 37 is so much weaker than spring 21, while valve 19 will remain seated due to the tension of spring 21. This action is desirable as where a rich dust mixture has been ejected through the hose 27, it can be followed by air alone to cause thorough distribution of the dust already ejected and clearance of the discharge hose 27 of any dust which may tend to remain therein.

Moving the pump handle downwardly faster and harder than normal, with the handle 39 in the "on" position will result in unseating both valves 19 and 35 with consequent ejection of relatively smaller quantities of dust due to the fact that a portion of the air is by-passed through the valve 35 without entrance into the dust container.

Thus the dust cut-off assembly gives a desirable control to the whole device not possible otherwise.

It will be seen that in the above instrumentalities there has been provided an assembly of an extremely simple construction which may be readily operated by an unskilled workman through the simple method of filling the container with dusting material, securing the same in place and then operating the pump handle. Due to the fact that a transparent container is used the operator may see at a glance when his supply of dusting material has become exhausted and replenish the same at will and with a minimum amount of delay and labor.

I claim:

1. A dusting device comprising a pump, a fixture secured to the bottom thereof and carrying a dust container, said fixture having an exit opening therein for dust and air, and two independently operative valves carried by the fixture, one permitting air from the pump to pass into the dust container and from thence to the exit opening, and the other permitting air to pass directly to the exit opening without going through the dust container.

2. The device of claim 1 with means to render one of said valves inoperative.

3. The device of claim 1 with means to render one of said valves inoperative, operable from outside the dusting device.

4. The device of claim 1 with means to render the second mentioned valve inoperative.

5. The device of claim 1 each of said valves being pressed into a closed position under the impulse of a spring, one of said springs being weaker than the other.

6. The device of claim 1 each of said valves being pressed into a closed position under the impulse of a spring, the spring on the last mentioned valve being weaker than the spring on the first mentioned valve.

7. A dusting device including a pump, a dust container adapted to receive air from the pump, an exit opening for dust and air, and two independently operative valves carried by the device, one permitting air from the pump to pass into the dust container and from thence to the exit opening, and the other permitting air to pass directly to the exit opening without going through the dust container.

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