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E. C. ST. ONGE
PAINT SPRAYING DEVICE
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2,023,710

Fig. 1.

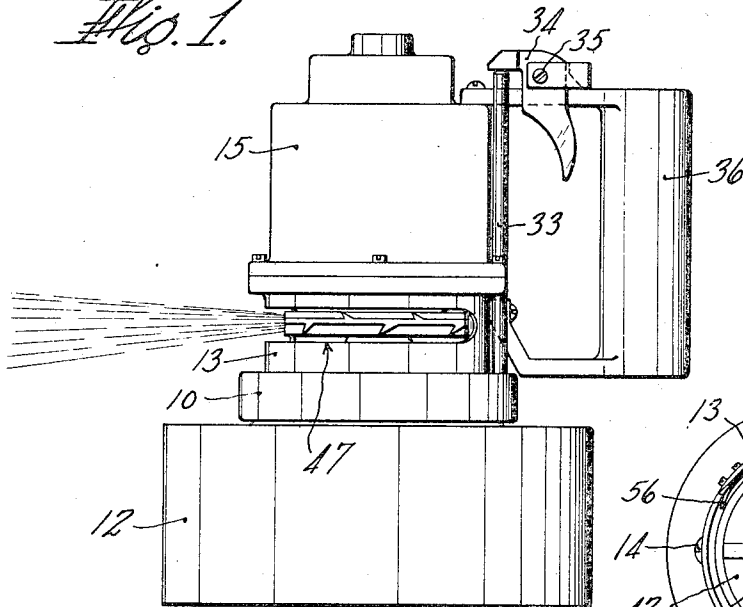


Fig. 2.

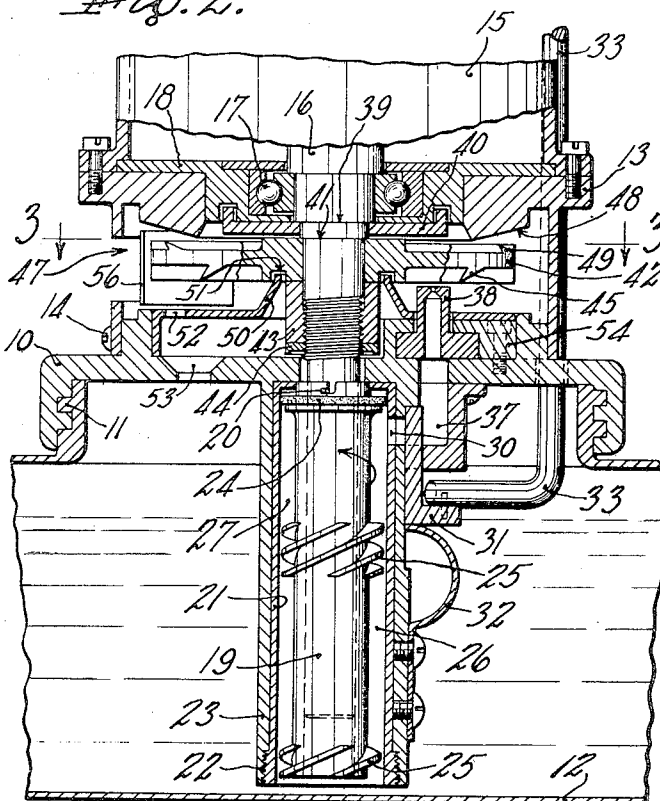


Fig. 3.

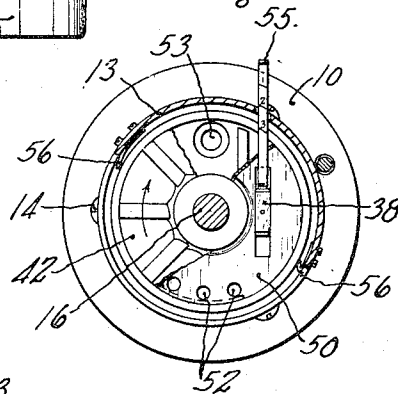


Fig. 4.

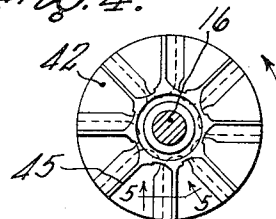
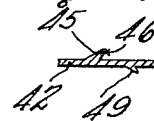


Fig. 5.



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UNITED STATES PATENT OFFICE

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PAINT SPRAYING DEVICE

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8 Claims. (Cl. 299—63)

This invention relates to improvements in paint spraying devices, and has for its object the improvement of prior devices of this kind and the correction of defects inherent in their operation. Paint spraying devices of the compressed air type are unsatisfactory for many purposes because of their large waste of paint and the injury to the health of the user consequent upon the dispersion of extremely fine particles of paint in the surrounding air. One specific object of the invention is the production of a paint spraying device which will reduce the dispersion of the paint to a point where the waste of paint and the amount breathed by the user will be made negligible. A further specific object is to make a portable device which is light and simple in construction and positive in action. A further specific object is to prevent the expulsion of paint globules of excessive size due to collection of paint upon the interior surfaces of the spraying device. A further object is to provide a simple and effective control for regulating the width of the band of paint sprayed with the device.

While the invention may be embodied in different mechanical structures, the preferred form of mechanism has been chosen for illustration in the drawing, in which

Fig. 1 is a side elevation of a spraying device made in accordance with the invention;

Fig. 2 is a central section through the device, taken on a scale somewhat larger than Fig. 1;

Fig. 3 is a section on line 3—3 of Fig. 2;

Fig. 4 is a detail of the lower side of the paint spraying disk; and

Fig. 5 is a section on line 5—5 of Fig. 4.

The spraying device is mounted upon a base member 10, threaded at 11 to which is a container 12. A central frame 13 is secured to the base 10 as by screws 14 and supports on its upper side the housing of a motor 15 which has not been illustrated in detail. The shaft 16 of the motor is fitted in the inner race of a ball bearing 17, the outer race of which is carried in a bearing block 18. At its lower end the motor shaft extends well within the container 12, furnishing support for a pump rotor 19 secured to the shaft as by a bayonet lock 20. A pump tube 21 is secured by threads 22 within a tubular extension 23 of the base 10, a packing washer 24 or other seal preventing the paint from following up the motor shaft. Spiral vanes 25 are formed on the rotor 19, extending almost into contact with the interior of the tube 21. Preferably the vanes 25 are divided into spaced groups,

leaving a chamber 26 between them and a chamber 27 above the upper group.

Into the chamber 27 leads a hole 30 extending through the extension 23 and the tube 21. A slide valve 31 is normally held by a bow spring 32 in the position of Fig. 2 in which it closes this hole, but can be moved down against the force of this spring by a rod 33. This rod slides vertically in suitable bearings and at its upper end is contacted by a finger lever 34 pivoted by a screw 35 upon a handle 36 secured to the motor housing and to the central frame 13. By pulling this lever with the finger the slide valve 31 may be shifted to open the hole 30. When the finger pressure is released the spring 32 again closes the valve. When the valve 31 is in open position the hole 30 communicates with a chamber 37 which is connected to the interior of the central frame 13 by a nozzle 38 which will be described in detail below.

The motor shaft is shouldered at 39 to receive a disk 40 having an upturned flange extending freely into an annular groove in the bearing block 18. The shaft is also shouldered at 41 to receive an impelling disk 42 secured in place by a threaded collar 43 and a lock nut 44. The bottom of the impelling disk is provided with a series of radial ribs 45 the active edges of which are preferably undercut as at 46 (Fig. 5). As the paint is forced by the screw pump 19 through the chamber 37 and the nozzle 38 the paint, in a fine jet due to the constricted opening of the nozzle, strikes against the lower surface of the rapidly rotating disk 42, each undercut surface 46 picking up a small quantity. As the disk continues to rotate the paint is carried by centrifugal force outwardly along the undercut surfaces of the ribs and is finally discharged in the form of a fan-shaped band through a slot 47 in the central frame.

The structure has been designed to prevent the ejection of large sized drops of paint due to the inevitable accumulation of liquid at different points within the device. The interior of the frame 13 is formed with a conical surface 48 slanting inwardly so that any drops forming will run back upon the upper surface of the disk 42, which is formed with radial undercut ribs 49 to atomize any such drops and eject them in the form of spray. A shield 50 is turned up at its inner side to project loosely into an annular groove 51 in the disk 42, and is provided with drain holes 52. Drain holes 53 are also provided in the base 10 so that any accumulation of paint below the disk 42 will be returned to the container 12.

In order to adjust the width of the fan-shaped spray which is ejected from the slot 47 the nozzle 38 is made movable in a direction across the surface of the disk 42. When the nozzle is located nearer the center of the disk the paint has a longer radial travel before ejection. During this longer travel it spreads out over a greater radial area in the undercut sides of the ribs, resulting in a longer period being utilized in ejecting each paint charge from a rib. Therefore with the nozzle near the center of the disk the fan-shaped spray will cover a wider angle than with the nozzle nearer the disk's periphery. For the purpose of shifting the nozzle it is formed with a T-shaped base fitting under ways formed in the base 10 and in a member 54 secured to the base by suitable screws. Any desired provision for adjusting the slide in the ways may be used, that shown including a pivoted lever 55 projecting through the side of the central frame. Adjustable guards 56 may also be used to close the edges of the slot 47 up to points adjacent the boundaries of the spray to avoid chance spattering of paint.

The use of the device is very simple. The motor, controlled by a convenient switch which it is not necessary to illustrate, is set in motion. Paint is then raised by the vanes 25 into the chamber 27. While the valve 31 is closed the paint will remain elevated in the chamber 27, there being sufficient clearance between the vanes and the tube 21 to permit continued rotation of the vanes. When the user desires to start the spray he depresses the trigger 34 and admits paint through the nozzle 38 to the underside of the rotating disk 42. The vertical jet of paint is deflected and thrown out in a horizontal fan-shaped spray.

What I claim is:

1. A paint spraying device comprising a rotating disk having on one side a plurality of angular ribs with undercut sides, a nozzle, means for forcing a stream of paint through the nozzle, a housing partially surrounding the disk, and means for adjusting the nozzle to different positions radially of the disk to thereby change the angular width of the spray discharged from the disk.

2. A paint spraying device comprising a casing, a motor secured to the casing and having a shaft extending vertically through it, a tube surrounding the shaft at its lower end, a receptacle secured to the casing to enclose said tube, impeller vanes mounted on the shaft within the tube to cause paint from the receptacle to rise through the tube, a disk secured to the shaft within the casing and having ribs formed on its lower surface, a nozzle mounted in the casing beneath the disk and connected by a passageway with the interior of the tube, and a valve interposed in the passageway to cut off the flow of paint through the nozzle, the casing being slotted adjacent the disk to permit the passage of paint thrown from the periphery of the disk.

3. A paint spraying device comprising a casing, a motor secured to the casing and having a shaft extending vertically through it, a pump connected to the lower end of the shaft, a receptacle into which the pump dips, a disk secured

to the shaft within the casing and having ribs formed on its upper and lower surfaces, a nozzle mounted in the casing beneath the disk and connected with the pump, the casing being slotted adjacent the disk to permit the passage of paint thrown from the periphery of the disk, and being shaped internally to cause drops of paint collecting within the casing above the disk to drop upon the upper surface of the disk.

4. A paint spraying device comprising a casing, a rotating disk within the casing, ribs extending in a generally radial direction upon both sides of the disk, means for directing a fine stream of paint against one side of the disk, and means for directing drops collecting within the casing against the other side of the disk.

5. A portable paint spraying device comprising a casing, a disk rotatably mounted in the casing, means carried by the casing for rotating the disk, a paint receptacle supported by the casing, and means for forcing paint from the receptacle directly against the under side of the disk, the casing completely enclosing the disk except for a slot adjacent the disk to permit the passage of a fan-shaped spray of paint.

6. A portable paint spraying device comprising a casing, a disk rotatably mounted in the casing and provided with outwardly extending undercut slots in its lower surface, means carried by the casing for rotating the disk, a paint receptacle supported by the casing, and means for forcing paint from the receptacle against the under side of the disk, the casing completely enclosing the disk except for a slot adjacent the disk to permit the passage of a fan-shaped spray of paint, and at least one adjustable guard movable to vary the effective angular length of the slot.

7. A portable paint spraying device comprising a casing provided with a handle, an electric motor mounted on the casing, a paint receptacle carried by the casing, a disk mounted in the casing and rotated by the motor, said disk being provided with outwardly extending undercut slots in its lower surface and a pump carried by the casing and operable by the motor to draw a jet of paint from the reservoir and direct it against the under side of the disk, the casing completely enclosing the disk except for an arcuate slot opposite the disk that permits the ejection of a fan-shaped spray of paint, the casing and the parts carried by it constituting a self-contained unit supportable by the handle and movable thereby across the surface to be painted with no external connection other than the conductors carrying the electric current.

8. A paint spraying device comprising a rotating disk having a plurality of radiating open channels with undercut sides formed upon its lower surface and serving to hold the paint suspended against the force of gravity as the disk rotates, means for forcing a jet of paint under pressure directly against the under side of the disk to cause it to be picked up evenly by said channels, and a casing surrounding the disk and provided with an opening affording a direct passage for a fan-shaped spray of paint thrown off by the rotating disk.

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