

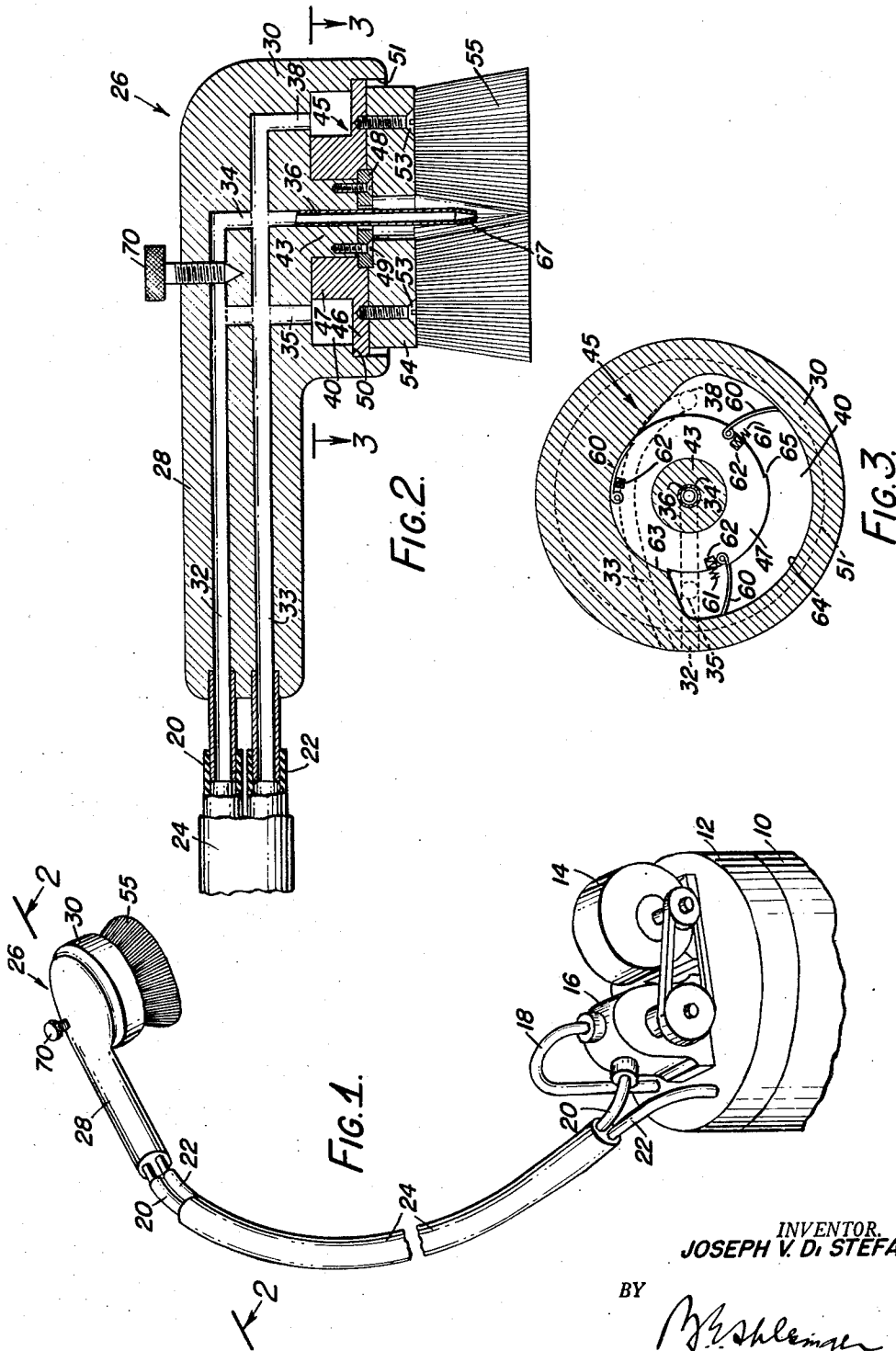
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ROTARY PAINTING BRUSH

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ROTARY PAINTING BRUSH

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The present invention relates generally to paint applicators and more particularly to paint brushes.

Painting a wall, or other surface, with a conventional paint brush, takes time and physical exertion. If a wide brush is used, the time required to cover a specified area with paint is relatively small because of wide brush strokes. However, the physical exertion or "pull" required for each brush stroke is substantial. Conversely, if a narrow brush is used, the physical exertion required per brush stroke is small, but the time required to cover a specified area with paint is relatively great. It is impossible to attain speed with slight physical exertion simultaneously when a surface is painted with a conventional paint brush.

Increased painting speed, without increased exertion, is attainable with various types of spray-painting devices. However, such devices can be used efficiently only on certain restricted painting tasks, for example, painting outside walls, the inside of an industrial plant, a storage tank, or some other large structure. Spray-painting is not practical on other tasks, where relatively small surfaces are involved, or the painting is to be done in a confined space. This is because of the limited application-control possible when spray-painting is employed.

The primary objects of the present invention are to provide a paint applicator which is speedy in use, easy to operate, and capable of being employed for practically all painting tasks.

Another object of this invention is to provide a paint applicator which will apply paint to a given surface at a rate of speed comparable to that obtained with spray-painting apparatus.

Another object of this invention is to provide a paint applicator with which paint can be easily spread on a surface to be painted and within definite, controlled boundaries.

Another object of this invention is to provide a paint applicator which has incorporated in it means for insuring the constant mixture of the paint being applied.

Another object of the invention is to provide a paint applicator in the form of a rotary brush that is power-driven but easy to manipulate.

Another object of the invention is to provide a paint applicator in the form of a rotary brush where the paint itself is used to drive the brush.

A further object of this invention is to provide a paint applicator of the character described, which, when used, wastes no paint.

A still further object of this invention is to provide a paint applicator which is of simple construction and thus easily manufactured and reasonable in price.

Other objects of this invention will be apparent hereinafter from the specification and from the recital of the appended claims.

In the drawing:

Fig. 1 is a perspective view of a paint applicator constructed according to one embodiment of this invention;

Fig. 2 is a section on an enlarged scale taken on line 2—2 of Fig. 1 looking in the direction of the arrows and showing in detail the structure of the brush, including the means for driving the same and for supplying paint thereto; and

Fig. 3 is a section taken on line 3—3 of Fig. 2, looking in the direction of the arrows.

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Referring now to the drawing by numerals of reference, 10 denotes a tank which is adapted to contain the paint that is to be used. Tank 10 has a cover 12 on which is mounted a motor 14 and a pump 16 driven by the motor.

The pump 16 is connected to the inside of tank 10 through a hose 18 to pump the paint from the tank. The pump delivers the paint through a flexible hose 20 to paint applicator designated generally by numeral 26. Paint is returned to the tank from the applicator, as will be described further hereinafter through a flexible hose 22 which communicates with the inside of the tank. The two hoses 20 and 22 are encased in a flexible tubing 24 to keep them together.

Applicator 26 comprises a handle portion 28 and an integral head portion 30. Applicator 26 is formed with two, parallel conduits, 32 and 33, which are connected to hoses 20 and 22, respectively. Feed conduit 32 connects with two ducts 34 and 35 that extend at right angles to it and that are parallel to one another. Duct 34 which is disposed centrally of the head 30, and is connected to a tubular ejection member or nozzle 36. Member 36 has its mouth outside of head 30. Conduit 33 terminates in a right angular duct 38 which is parallel to ducts 34 and 35. Ducts 35 and 38 are disposed at diametrically opposite sides of duct 34. They communicate with an arcuate recess or chamber 40 formed within head 30, adjacent opposite ends of said recess (Figs. 2 and 3).

Mounted on the reduced-diameter, centrally-disposed bearing portion 43 of head 30 is the hub 47 of a rotor 45. This rotor is journaled for rotation on bearing portion 43 and is held against axial movement relative to head 30 by disc or washer 48 which is secured to bearing portion 43 by screws 49. Rotor 45 is also formed with a flange portion 46 which seats against a shoulder 50 formed by a counterbore 51 in head 30. Secured to the flange portion 46 of rotor 45 by screws 53 is the head 54 of a rotary brush 55.

Pivotaly mounted in angularly spaced relation around the periphery of the hub 47 of the rotor 45 are three vanes 60. Coil springs 61, which are mounted in recesses 62 in the periphery of the rotor constantly urge the vanes outwardly away from the hub of the rotor. The vanes have a depth equal to the depth of chamber 40 and a length sufficient for them to have substantially liquid-tight engagement with the outer wall 64 of the chamber when they are in extended positions.

The stream of paint flowing under pressure out of delivery duct 35 into recess or chamber 40 drives the rotor 45, rotating the brush 55. The paint, here acting as a motive fluid, engages and drives the vanes 60 as they move through chamber 40. As the vanes pass out of the chamber 40, however, they are collapsed against the periphery of the rotor by engagement with the surrounding bearing wall 63 of the bore of head 30. The springs 61 yield permitting compression of the vanes against the rotor periphery, as shown in the case of the uppermost vane in Fig. 3. Slight depressions 65 are provided in hub 47 to receive the vanes when they are closed.

From the preceding it will be seen that as long as the motor 16 is running and there is paint in tank 10 to be delivered to chamber 40 by the pump, the rotor 45 will be driven, and the brush 55 will rotate.

As long as pump 16 is running and there is paint in the tank 10, paint for painting the surface, which is to be painted, will also be delivered to the brush 55 through nozzle 36. Nozzle 36 extends down into the center of the brush toward the front, operating end of the brush. The bristles in the brush flare outwardly from head 54, creating a cone-shaped space 67 in the middle of the brush into which nozzle 36 extends.

A needle valve 70, which threads into head 30 and engages in conduit 32, serves to control the rate of flow of the paint to the brush.

To use the applicator, motor 14 is started to operate pump 16 and pump the paint from tank 10. The paint is forced through outlet hose 20 into feed line 32, and thence into chamber 40 through duct 35 and into the brush 55 through duct 34 and nozzle 36. The paint entering chamber 40 exerts pressure against vanes 60, causing rotor 45 to rotate, driving brush 55. The paint flowing from nozzle 36 into space 67 is applied by the rotating brush 55 to the surface which is to be painted. The paint, which enters chamber 40, is returned to tank 10, after it has dissipated its driving force, through duct 38, conduit 33, and piping 22. Thus, the paint circulates continually between tank 10 and applicator 26, with a portion of the pressurized paint being applied to the surface being painted and another portion being used to rotate rotor 45 and brush 55.

With the device just described, the paint in tank 10 is constantly maintained in a mixed condition because of continual movement of the paint in and out of the tank. This insures uniformity of the paint itself and aids in protecting applicator 26 from clogging. Furthermore, the connections between the various parts of the device prevent air from coming into contact with the paint, before it reaches the brush 55.

The amount of paint being deposited in brush 65 can easily and quickly be varied and controlled by adjusting needle valve 70.

Since the paint moves from inside the brush to the outside working end, the brush can easily be used to paint within definite, restricted areas, the same as with conventional paint brushes, and no paint is lost through dripping or other reasons. Further, the flare of the brush 65 at its outer end enables the user to paint right up to a border without spattering paint beyond the border.

The nozzle 36 sprays the paint onto the surface which is to be painted; and the brush 55 serves to spread the paint smoothly and uniformly over the surface. The handle portion 28 of the applicator permits easy movement of the brush over the surface which is to be painted. A large area can be painted, therefore, in a very short time by simply moving the brush back and forth in long overlapping strokes.

The paint applying device of this invention possesses all of the advantages associated with spray-painting but has none of the disadvantages.

While this invention has been described in connection with a specific embodiment thereof, then, it will be understood that it is capable of further modification, and this application is intended to cover any variations, uses, or adaptations of the invention, following, in general, the principles of the invention and including such departures from the present disclosure as come within known or customary practice in the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth and as fall within the scope of the invention or the limits of the appended claims.

Having thus described my invention what I claim is:

1. A brushing device for power application of paint to a surface comprising an elongate handle providing a gripping means for manipulation of the device, said handle being formed with a head projecting laterally from one side thereof at one end thereof, said head having a chamber formed therein, said handle also being formed with an inlet duct therethrough for conducting paint under pressure through said handle to said chamber and with a separate outlet duct therethrough for the passage of paint from said chamber out of said handle, said ducts extending from the other end of said handle through said handle in adjacent, substantially parallel relation, a pair of feed ducts communicating with and extending laterally from said inlet duct, one of said pair of feed ducts being angularly directed from said handle into said head to com-

municate with said chamber, said head being formed with a central bearing portion that is disposed centrally in said chamber, a rotor-brush assembly including a rotary member mounted to close the outside of said chamber, a hub projecting from one side of said rotary member and journaled on said bearing member, a plurality of vanes mounted around the periphery of said hub, said one feed duct being disposed to supply paint to said chamber to drive said rotary member under pressure of the paint supplied from said inlet duct through said one feed duct into said chamber, bristles mounted on said rotary member to project laterally outwardly from said head, said outlet duct communicating with said chamber at a point angularly spaced from said one feed duct to conduct paint from said chamber, said other feed duct being disposed to project coaxially through said rotary member into said bristles at a point spaced laterally forward from said rotary member to supply paint to said bristles, and a valve mounted in said handle between the points of communication of the two feed ducts with said inlet duct to control flow of paint between said other feed duct and said inlet duct thereby to control supply of paint under pressure to said bristles without interfering with supply of paint to said chamber.

2. An assembly for the power application of paint to a surface comprising, in combination, a paint reservoir, an applicator including an elongate handle providing a gripping means for manipulation of the device, said handle being formed with a laterally-projecting head at one end thereof which has a chamber formed therein at one side thereof, said handle also being formed with an inlet duct therethrough for conducting paint under pressure through said handle to said chamber and with a separate outlet duct therethrough for the passage of paint from said chamber out of said handle, said ducts extending from the other end of said handle through said handle in adjacent, substantially parallel relation and being angularly directed from said handle through said head to communicate with said chamber, said head being formed with a bearing member that is disposed in said chamber, a rotor-brush assembly including a rotary member mounted to close said chamber, a hub projecting from one side of said rotary member and journaled on said bearing member, a plurality of vanes mounted around the periphery of said hub to drive said rotary member upon the passage of paint under pressure from said inlet duct through said chamber and into said outlet duct, bristles mounted on said rotary member to project outwardly from said head and laterally of said handle, a tube mounted in said handle to project coaxially through said rotary member into said bristles, means mounted in said handle including a valve to provide communication between said tube and said inlet duct to supply a regulated amount of paint under pressure to said bristles, and means for continuously circulating paint from said reservoir, through said inlet duct, into said chamber to drive said rotary member and its attached bristles, from said chamber, into said outlet duct, and back to said reservoir, thereby to effect continuous mixing of said paint.

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