

May 5, 1925.

J. D. MURRAY

1,536,352

SPRAYING APPARATUS

Filed April 22, 1924

Fig. 1.

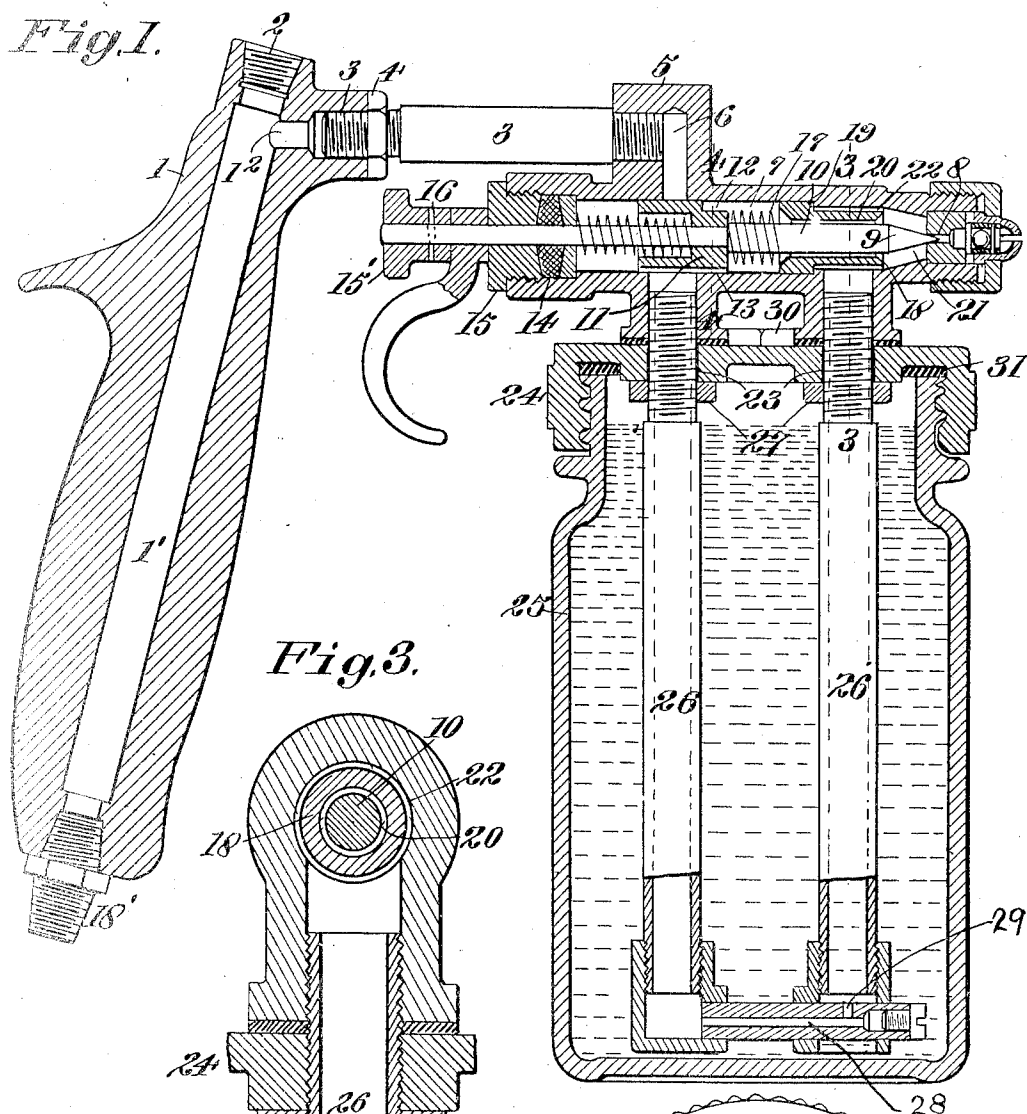


Fig. 3.

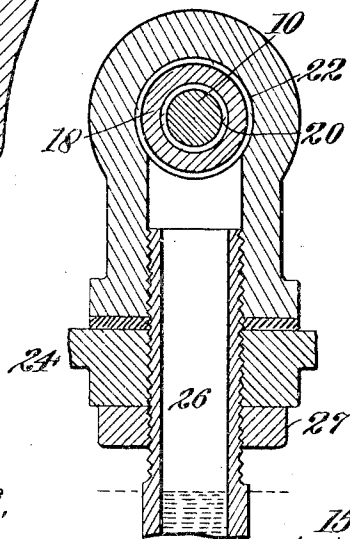


Fig. 2.

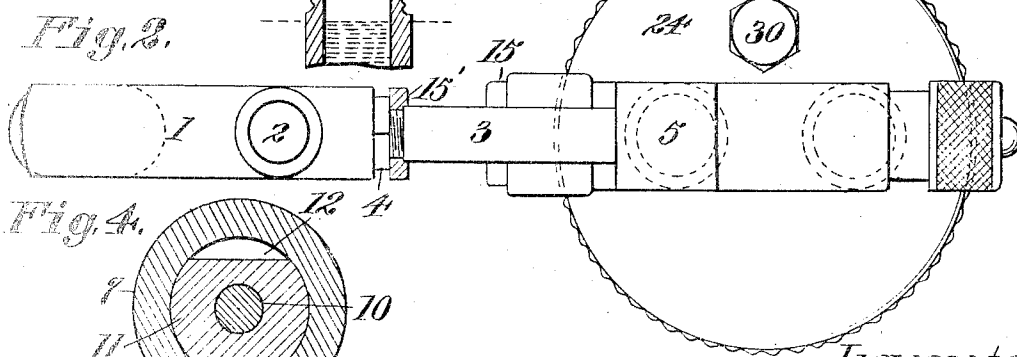
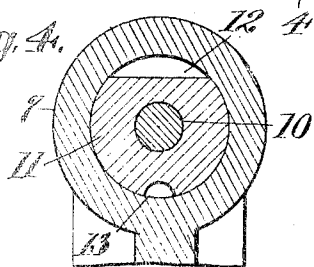


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN D. MURRAY, OF SAN FRANCISCO, CALIFORNIA.

SPRAYING APPARATUS.

Application filed April 22, 1924. Serial No. 708,189.

To all whom it may concern:

Be it known that I, JOHN D. MURRAY, a citizen of the United States, residing at the city and county of San Francisco, and State of California, have invented certain new and useful Improvements in Spraying Apparatus, of which the following is a specification.

My present invention relates to improvements in spraying apparatus of the type commonly termed "air brushes," by the use of which paint and like coatings are easily applied in a readily controllable manner.

The present invention is designed particularly for use in connection with the application by the air brush method of heavy coatings such as enamels, and other liquids having celluloid as a base; one of the celluloid base liquids being termed "Ry-Namel" in the trade. In the application of the latter material, considerable difficulty has been experienced due to its heavy viscosity in the atomizing thereof in a fine spray for an even and uniform application. Difficulty has also been experienced in properly atomizing the celluloid base liquid in the presence of sufficient air to discharge it from the apparatus and at the same time prevent clogging.

It is to overcome these objections that the present apparatus has been designed, and it has for one of its principal objects to provide an air brush apparatus of what may be termed the "jar" type wherein air under pressure is supplied in a divided flow, a portion of it entering the liquid container to agitate and elevate a portion of the mixture and the remainder of which acts on the partially atomized body of air and liquid to further aspirate the same and discharge it from the apparatus in the form of a mist or fine spray. Other objects are to provide a novel form of air regulation and control, to provide a simple form of mounting whereby the air tubes depending into the jar provide a union between the jar cover and gun body. A further object is to provide an apparatus wherein the liquid to be atomized enters the nozzle from a point at the base of the jar and is raised and agitated by an air stream under pressure.

With the above mentioned and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings, and set forth in the

claims hereto appended, it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

To more fully comprehend the invention reference is directed to the accompanying drawings, wherein—

Fig. 1 is a view of a vertical section of the preferred embodiment of my apparatus.

Fig. 2 is a view in top plan.

Fig. 3 is a transverse sectional view on line 3—3 of Fig. 1, disclosing the configuration of the needle valve body and the air restriction sleeve.

Fig. 4 is a sectional view on line 4—4 of Fig. 1 disclosing the cross sectional configuration of the air valve and the needle valve stem.

In the preferred embodiment of my invention, 1 illustrates a handle of the pistol grip type having a bore 1' extending there-through, and said channel mounts at its lower end a nipple 18' for connection with an air hose, not shown, and is closed at its free end by a suitable plug 2. Threaded into the lateral channel 1² is the end of an air pipe 3 retained in position by a lock nut 4. The air pipe 3 at its outer end mounts a suitable valve body casting 5 formed with a vertical channel 6 therein which communicates with an open ended chamber 7 disposed preferably in a substantially horizontal position when the handle 1 is held in a substantially upright position. Detachably secured in any suitable manner to the outer or discharge end of the channel 7 is a discharge tip preferably of the type illustrated and described in my Patent No. 1,503,001 granted July 29, 1924. The discharge of the atomized liquid through the orifice 8 in the tip is controlled by the needle end 9 of an axially rotatable and longitudinally movable valve 10 disposed longitudinally within the channel 7. The valve 10 at its rear end projects beyond the rear end of the channel 7 and within its length said valve carries a secondary air valve 11 of a diameter to snugly fit within the channel 7. The valve 10 extends through the air valve 11, which latter valve is sweated on the valve 10 so that the air valve will move either axially within or longitudinally of the channel 7.

Near its forward end the air valve 11 is provided with a transverse cut 12 and in its body the valve is formed on its periphery with a longitudinal air passage 13. A stuffing box including a packing 14 and nut 15 closes the rear end of the channel 7 and provides a guide for the valve 10. A rotatable finger grip 15' is carried at the extreme rear end of the valve 10 and the same is pinned as at 16 to rotate therewith. A finger grip or trigger 7 is secured to the valve 10 in advance of the member 15 but the valve is capable of movement axially within the trigger as is illustrated. The needle end 9 of the valve 10 is normally seated by a spring 17 acting on the rear of the air valve 11, and to provide a guide for the forward end of the valve 10 a sleeve 18 is inserted in the forward end of the bore, its forward movement being limited by the shoulder 19. The inner diameter of the sleeve is slightly greater than the circumference of the valve 10 to afford an air passage 20 circumferentially of the valve in rear of the needle tip, and the peripheral diameter of the forward end of the sleeve is slightly less than the inner diameter of the discharge end 21 of the bore 1' to provide a circumferential channel 22.

The lineal movement of the valve 10 controls the passage of the material from the orifice 8 and also operates the air valve 11 to vary the passage of air from channel 6 into the channel 7. The axial adjustment of valve 10 controls the volume of air adapted to enter the channel 7, as such axial rotation increases or decreases the effective area of the discharge end of the channel 6.

The valve body 5 at points below the discharge end of channel 6, and also below the annular chamber 22, is provided with threaded bores which are adapted to register with corresponding openings 23 formed in the cover 24 adapted for threading to a jar container 25 of the well known type.

Extending through the openings 23 and threaded into the bores thereabove are the upper ends of tubular conductors 26 and 26', each mounting a clamping nut 27 which retain the cover in contact with the under surface of the member 5. The members 26 and 26' are of a length to extend in close proximity to the bottom of the container 25, and downwardly through the member 26 passes a stream of air under pressure, it being controlled by the operation of valve 11. The lower end of conduit 26' is open, and said open lower end is connected by a transverse conduit 28 with the conductor 26, said pipe 28 having an air discharge orifice 29 in its wall disposed axially of the lower end of the conductor 26'. The conductor 26' is adapted for receiving the liquid material to a point up to the level of the ma-

terial within the container 25, and on the discharge of air from the orifice 29, the directional air stream in the conductor 26' will break up the liquid material in the conductor 26' and cause the same to enter the chamber 22 around the needle 9 in an atomized form. At this point a portion of the air which has collected around the valve 10 passes through the channel 20 and intermixes with the atomized body within the chamber 21 and projects the same through the discharge orifice 8. It will be observed that the action of the air jet from orifice 29 maintains the material in the base of the container 25 in an agitated condition, also that the size of the orifice 29 will direct a small volume of air under pressure in a jet stream upwardly into the conductor 26' while the remainder of the volume of air under pressure remains in the channel 7 to intermingle with the atomized liquid as the same enters the chamber 21, and will assist in discharging the atomized liquid from the orifice 8. It is observed that the cover 9 may be removed from the receptacle to enable the receptacle to be filled or cleaned, but a filling opening 30 is provided in the cover for use when it is not desired to separate the cover from the receptacle. To provide tight joints between the co-operating surfaces, I propose to employ packing material 31 where illustrated.

I claim:

1. An air brush including a container for the material to be applied, an air pipe leading to the bottom thereof, an open ended material discharge pipe extending to the bottom of the container, and into the lower open end of which the air pipe discharges, a body to which the container is detachably secured, the body provided with a discharge orifice and further provided with a mixing chamber within which the material discharge pipe connects, a valve for controlling the discharge orifice, an air supply, and a secondary valve carried by the main valve for controlling the admission of air directly into the mixing chamber and into the air pipe.

2. An air brush including a container for the material to be applied, an air pipe leading to the bottom thereof, an open ended material discharge pipe extending to the bottom of the container, a pipe extending from the air pipe into the lower end of the material discharge pipe and provided with a discharge orifice directed axially into the discharge pipe, a body to which the container is detachably secured, the body provided with a discharge orifice and further provided with a mixing chamber within which the material discharge pipe connects, a valve for controlling the discharge orifice, an air supply, and a secondary valve carried by the main valve for controlling the

admission of air directly into the mixing chamber and into the air pipe.

3. In combination with an air brush reservoir, a removable cover for the reservoir for detachable securing thereto, a pair of pipes carried by the cover and extending into the reservoir and constituting air inlet and mixture discharge pipes, the mixture discharge pipe being open at both ends, means for supplying air to the upper end of said air inlet, means for receiving the mixture of air and material from the upper end of the mixture discharge pipe, and a connection between the lower end of the air inlet pipe and the inlet end of the mixture discharge pipe.

4. In combination with a body provided with a main channel terminating at one

end in a discharge orifice, means for delivering air under pressure into said channel, said body provided with a pair of channels leading therefrom, a receptacle for containing material to be applied, a cover therefor provided with a pair of ports for registering with said channels, a pair of pipes extending through said ports and threaded into said channels clamping means on said pipes for retaining the cover wall in contact with the body, one of said pipes provided with an inlet opening at its lower end, and a discharge nozzle leading from one pipe and discharging axially into the lower open end of the other pipe.

In testimony whereof I have signed my name to this specification.

JOHN D. MURRAY.