July 19, 1927.

1,636,314

J. D. MURRAY

SPRAY NOZZLE AND TIP

Filed Nov. 12, 1925

Fig. 1.



Fig. 2.



Fig. 3.

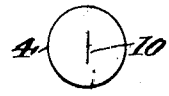


Fig. 4.



distended

Fig. 5.

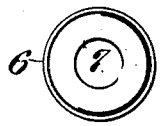


Fig. 6.

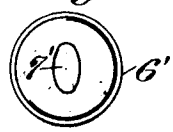


Fig. 7.

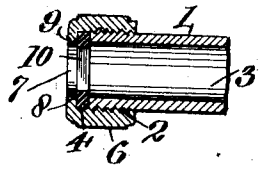
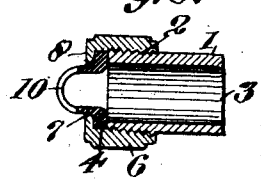


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN D. MURRAY, OF SAN FRANCISCO, CALIFORNIA.

SPRAY NOZZLE AND TIP.

Application filed November 12, 1925. Serial No. 68,657.

The present invention relates to a spray nozzle and tip designed for general use where it is desired to spray materials under pressure.

The objects of the present invention are to provide a tip which will automatically control various widths of spray or film under various pressures; to provide a tip which will automatically cut off any leakage therefrom when the liquid applying pressure is cut off; and to provide an elastic tip which is inexpensive, durable, and is adaptable for use in the application of liquids or in sand blast apparatus.

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 sheet of drawings, and set forth in the claims hereto annexed, it being understood that various changes in 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.

In the accompanying drawings:—

Fig. 1 is a view in side elevation of the elastic disc constituting the discharge tip of the spray nozzle.

Fig. 2 is a plan view of the disc with a small orifice in the center.

Fig. 3 is a plan view of the disc showing the same provided with a slit.

Fig. 4 is a cross section of the disc showing its position when under pressure.

Fig. 5 is a plan view of the collar provided with a round orifice for use in connection with the disc illustrated in Fig. 2.

Fig. 6 is a plan view of the collar provided with an oval orifice for use with the disc illustrated in Fig. 3.

Fig. 7 is a longitudinal central sectional view illustrating the slitted disc held at the outlet end of the discharge pipe.

Fig. 8 is a view similar to Fig. 7 with the material to be applied under pressure illustrating the distortion of the slitted disc under working conditions.

Referring to the drawings wherein like characters of reference designate corresponding parts, the numeral 1 indicates the discharge end of a spraying pipe, having a peripheral threaded end 2. Through the bore 3 passes liquid or other material under pressure supplied from any suitable source, not shown. Transversely across the end of pipe 1 with its inner periphery against the end wall is an elastic disc 4 preferably of rubber having a minute aperture 5 in its center. Threaded onto the discharge end 1 is a collar 6, the transverse end wall 8 thereof being provided with a spray orifice 7, which, upon the coupling of the parts 6 and 1, bears against the edge of the yieldable disc 4, as shown in Fig. 8, thus holding the same firmly in position between the end wall of the collar 6 and the end wall of pipe 1. In operation, the fluid stream flow entering the tubular pipe 1, under pressure, will be forced out through the aperture 5 in the elastic disc 4.

The pressure of the fluid flow against the disc distends the center of the same through the orifice 7 of the collar 6, which is the same shape but of diameter larger than aperture 5, and discharges through the orifice or aperture 5 in the elastic disc 4. The inner peripheral edge of the wall 8 surrounding and facing aperture, is rounded or beveled as at 9 to reduce the liability of the elastic disc 4 becoming cut when the same is distended under pressure through the orifice 7. The elastic disc 4 may be provided with a slit 10 when it is desired to supply a flat stream, and with it is employed a collar 6′ having an oval aperture 7 aligned with the slit 10. When a slitted disc is under pressure and an oval apertured collar 6′ is provided, the central portion of spray or film will be of greater thickness than the film discharged from the ends of said slit. This is occasioned by the fluid pressure against the disc 4 distending the central portion and causing the slit to open to a greater degree at its center than at its ends.

It is to be noted that when the pressure against the disc 4 is reduced, the disc will return in proportion to the pressure to its normal position, as shown in Fig. 8, and due to the elasticity of the disc and the minuteness of the aperture 5 or slit 10, said aperture 5 or slit 10 will close on the elimination of pressure behind the same precluding liquid leaking from said tip.

The punctured or slitted elastic disc is equally as well adapted for use in sand blast apparatus as well as in liquid spraying apparatus, it having been established that the cutting action of sand or other hard particles on the edges of the puncture or slit are reduced to a minimum due to the elasticity,

flexibility and yieldability of the disc structure.

Due to the elasticity of the disc 4, the same is self clearing of solid particles forced against the rear thereof, the particles propelled by the pressure distort the disc until they pass through the opening therein.

The shape of the collars 6 and 6' and the orifice or slot 10 therein control the operative shape of the disc 4.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent of the United States is:—

1. In combination with a spray pipe, an elastic disc disposed transversely across the discharge end thereof and centrally punctured affording a spray orifice, and means for peripherally holding the disc in position with its center free for distension from its normal position on the application of pressure to one face thereof, said means provided with an orifice through which the disc is distended, said orifice last mentioned controlling the contour of the distended portion of the disc.

2. In combination with a spray pipe, an elastic disc disposed transversely across the discharge end thereof and transversely slit affording a spray orifice, the walls of which are normally in contact, and means for peripherally holding the disc to the outlet end of the spray pipe, said means provided with an oval orifice in alignment with the slit and through which the disc is distended on the application of pressure to one face thereof.

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

JOHN D. MURRAY.