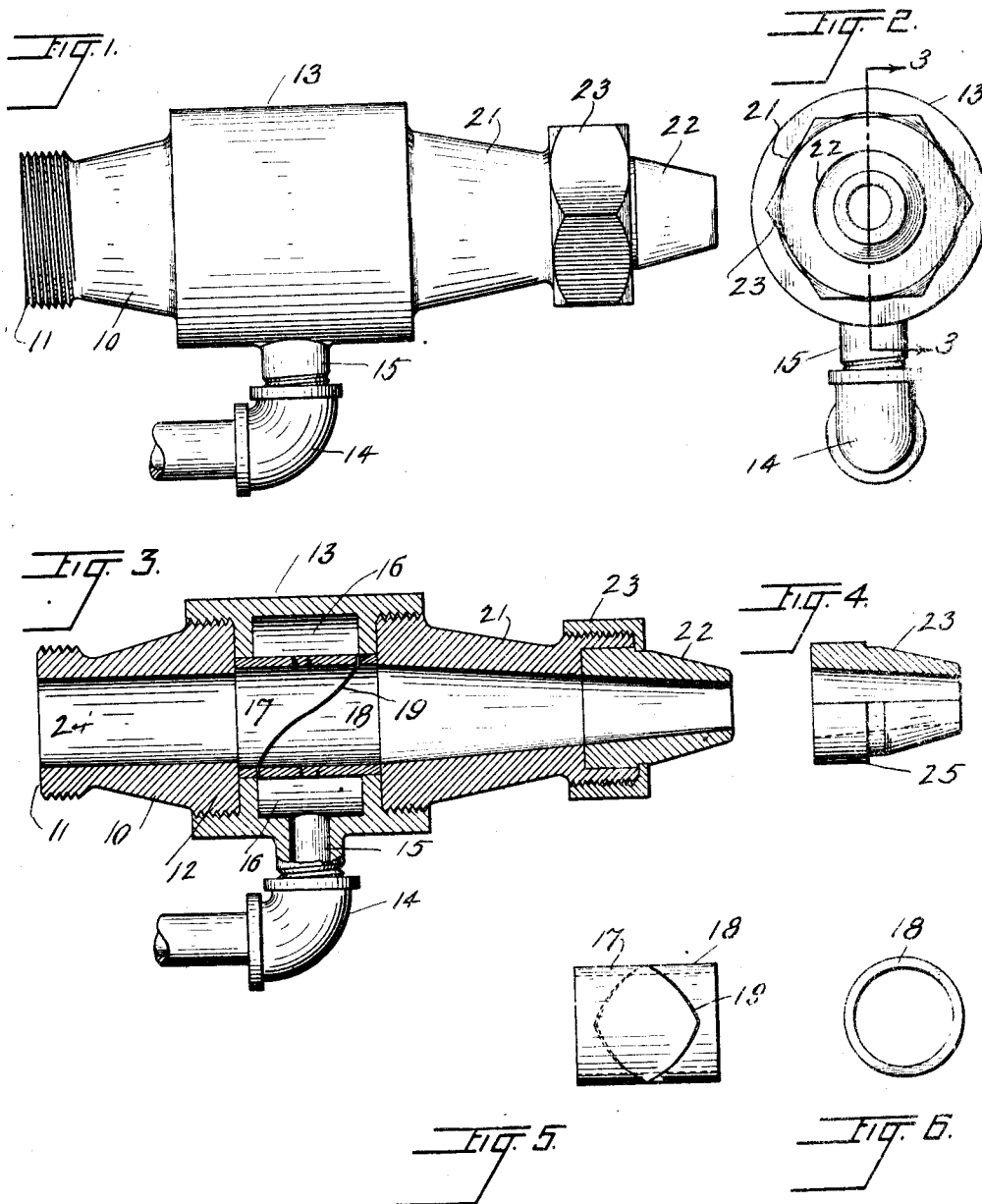


E. K. HAND.
NOZZLE.
APPLICATION FILED MAY 28, 1913.

Patented Feb. 10, 1914.

1,087,086.



WITNESSES:
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EDGAR K. HAND, OF CHICAGO, ILLINOIS.

NOZZLE.

1,087,086.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDGAR K. HAND, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Nozzles, of which the following is a specification.

This invention relates to nozzles, and particularly to nozzles for combining and discharging comminuted solids and liquids, or to use either separately, with or without the use of compressed air.

The object of the invention is to improve nozzles used for the purposes indicated.

When gritty materials are discharged, considerable wear takes place at the discharge outlet and I therefore provide a detachable end piece which can be easily replaced.

Comminuted solids, such as plaster or the like, when delivered from a nozzle must be saturated with water at a point close to the place of deposit, to obtain practical results, for instance in spraying a wall with liquid plaster or mortar, and I therefore provide a nozzle having a jacket for the liquid, having an internal outlet into the main bore of the nozzle, with pipe or other connections for supplying the solid material and the liquid.

In mixing nozzles of the type referred to sprays have been produced by forcing liquid through one or more openings in the side of the nozzle, and tapered openings have also been used, all of which have been found to be faulty. I provide a spiral slot leading from a jacket into the bore of the nozzle, and this slot provides means for wetting the exterior surface of any comminuted solid or mixture that may be passing through the nozzle, the slot producing a blade like stream of liquid which will thoroughly saturate said material, the liquid entering the bore of the nozzle around the whole circumference thereof and being directed toward the axis of the nozzle. The slotted aperture is less liable to become stopped or choked, since drilled apertures are easily stopped up and the spacing thereof will not permit or produce a continuous circular flow of liquid into the body of material passing through the nozzle.

A nozzle constructed according to my invention is illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of the same.

Fig. 2 is a front end view. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is a detail of the removable end piece. Figs. 5 and 6 are details in side and end view of the inner wall of the jacket having the curved or spiral slot.

Referring specifically to the drawings, 10 indicates the rear end piece or member of the nozzle, threaded at each end, the end 11 being designed for the attachment of a pipe or conduit for the comminuted solid or granular material, and the opposite end 12 is screwed into the annular liquid jacket 13, which at one side has a connection 15 for a water pipe 14 through which liquid is applied to the inner annular chamber 16 of the jacket, the inner wall of the chamber being formed by tubular sections 17 and 18 which are spaced apart to produce a continuous spiral or curved slot 19 therebetween, said tube sections being confined in the jacket between the rear piece 10 and the front piece 21 which is screwed into the front end of the jacket.

The front end of the member 21 is recessed to receive a removable tubular end piece 22 which is held in place by a locknut 23 screwed on the end of the member 21, with a flange engaging an external shoulder 25 on the end piece.

The bore 24 of the rear member 10 is somewhat smaller than that of the inner wall sections 17 and 18 of the jacket, which permits the material being forced through the nozzle to expand and loosen as it passes through said sections, whereby the water forced through the slot 19 is enabled to more freely enter the material, thereby obtaining a more complete and thorough saturation; and the bore of the members 21 and 22 tapers from a diameter equal to that of the member 18 to a smaller diameter at the mouth. This tapered bore produces a choking effect on the material, after it is saturated, and forces the particles close together, thereby obtaining greater density, which in certain cases is desirable for practical results.

The comminuted solids or the like are forced through the main bore under pressure, and the liquid supplied through the pipe 14 to the annular chamber 16 escapes in a continuous sheet through the curved groove 19 and penetrates and saturates the material, forming a plastic or semifluid

composition which is discharged through the end piece. The end piece can be renewed as often as it wears out.

What I claim as new is:

5 . A mixing nozzle provided with an annular fluid-supply chamber extending around the same, the inner wall of the chamber having a continuous slot connecting said chamber and the bore and extending
10 around the latter.

2. A mixing nozzle provided with a jacket extending around the same and forming an annular liquid-supply chamber, the inner wall of the chamber having a slot extending
15 around the same and opening from said chamber into the bore of the nozzle, the said bore being enlarged within said chamber, to permit expansion of material passing through said bore.

20 3. A mixing nozzle comprising tubular inlet and outlet members, an intermediate jacket member therebetween, and inner tu-

bular sections within said jacket member, forming an annular fluid-supply chamber therein, the said sections being spaced apart 25 to form a slot connecting said chamber and the inner bore.

4. A mixing nozzle comprising tubular inlet and outlet members, an intermediate jacket member therebetween, and inner tu- 30 bular sections within said jacket member, forming an annular fluid-supply chamber therein, the said sections being spaced apart to form a slot connecting said chamber and the inner bore, the internal diameter of said 35 sections being greater than that of the inlet member.

In testimony whereof, I affix my signature in presence of two witnesses.

EDGAR K. HAND.

Witnesses:

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HENRY S. MOON.