July 27, 1943. R. O. HOWARD 2,325,517

SAND BLAST NOZZLE

Filed Feb. 7, 1942

Fig. 1.

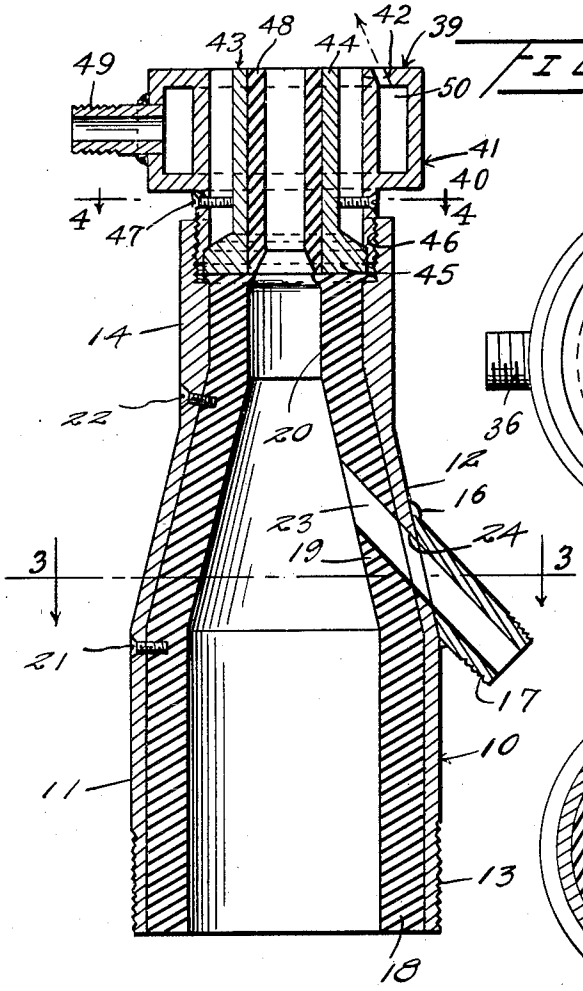


Fig. 2.

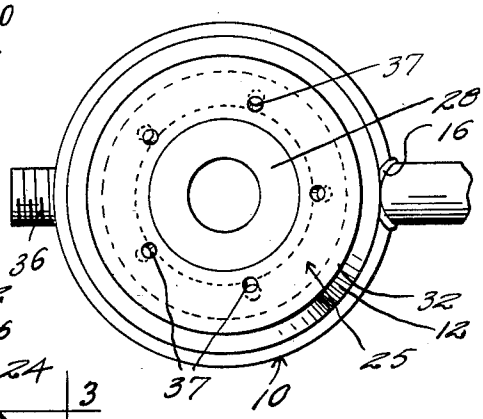


Fig. 3.

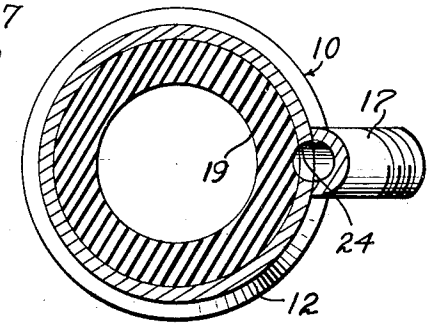
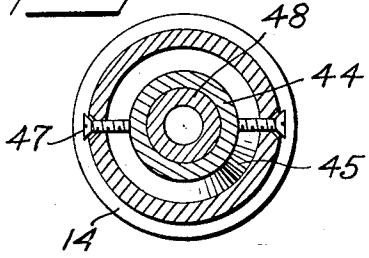


Fig. 4.



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SANDBLAST NOZZLE

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5 Claims. (Cl. 51—11)

This invention relates to sand blast nozzles.

An object of this invention is to provide a nozzle formed of an outer shell and an inner lining having a characteristic to resist abrasion by the sand flowing therethrough.

Another object of this invention is to provide in a sand blast nozzle means for discharging water thereinto rearwardly of the tip.

A further object of this invention is to provide a nozzle of this kind with an improved tip having means for directing a conical head of water forwardly of the tip.

A further object of this invention is to provide in a nozzle of this kind an improved tip formed with a water jacket provided with jet openings adapted to produce a conical body of water forwardly of the tip for washing or cleaning the sand from the work.

A further object of this invention is to provide a nozzle structure including a lined body formed with a tapered forward end on which tips of various types may be mounted.

To the foregoing objects and others which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically referred to and illustrated in the accompanying drawing, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawing:

Figure 1 is a longitudinal section of a sand blast nozzle constructed according to an embodiment of this invention,

Figure 2 is a detail front end elevation of the nozzle,

Figure 3 is a sectional view taken on the line 3—3 of Figure 1,

Figure 4 is a sectional view taken on the line 4—4 of Figure 1.

Referring to the drawing the numeral 10 designates generally an outer metallic jacket which is formed of a cylindrical body part 11 having threads 13 at its rear end for connection with a sand conducting tube wherein the sand is under air or other fluid pressure.

The jacket member 10 also includes a frustoconical jacket member 12 terminating at its forward end in a reduced cylindrical jacket member 14 having interior threads 15.

The jacket member 12 has fixedly secured thereto as at 16 an obtusely disposed water conducting nipple 17 which is adapted to be connected to a source of water supply, so that water may be discharged into the interior of the jacket 10. The inclination of the nipple 17 is such as to force the sand and water within the jacket 10 forwardly for discharge through the forward end of the jacket 10.

A rubber lining 18 is disposed within the jacket member 11 and is constructed of what is known as sand blast rubber hose which is of a construction to resist abrasion by the sand passing therethrough. The forward jacket member 12 is also formed with a lining 19 constructed of rubber such as sand blast rubber or the like, and the lining is formed integral with the lining 18. The lining 19 at its forward or reduced end terminates in a cylindrical forward lining member 20 disposed within the nipple or tip coupling 18.

The lining members comprising the parts 18, 19 and 20 may be removably held in the jacket members 11, 12 and 14 by means of set screws 21 and 22, so that when it is desirable or necessary to replace the lining members, the set screws 21 and 22 may be released, and the lining removed and substituted by a new lining. The lining member 19 is formed with an inclined opening 23 which registers with the inner end of the opening 24 formed in the jacket 12. The openings 23 and 24 are coaxial with the nipple 17, so that the water discharged into the jacket 10 from the nipple 17 will be in the direction of the flow of the sand.

A tip structure 39 is threaded into the forward end of the nipple 14 of the nozzle structure 10 shown in Figure 1. The tip structure 39 includes an outer cylindrical member 40 which has a water jacket 41 on the forward end portion thereof. The jacket 41 is similar in every detail to the jacket 25, being provided with a plurality of forwardly and inwardly inclined jet openings 42 for discharging a conical column of water forwardly of the tip.

An inner tip member 43 is disposed within the cylindrical outer tip member 40 and includes a cylindrical tip member or nipple 44 which at its rear end is formed with an annular flange 45. The flange 45 is adapted to seat at its rear end on the forward end of the nipple or coupling member 14 of the jacket 10. The rear portion of the cylindrical tip member 42 is provided with an annular recess 46 within which the outer portion of the rib or flange 45 is adapted to engage. Preferably, the width of the flange 45 is slightly greater than the depth of the groove or recess 46, so that a portion of the flange 45 will project rearwardly of the outer jacket member 40. In this manner when the tip 39 is tightened within

the nipple 14, the flange 45 will tightly bear against the forward end of the nipple 14, and will be tightly pressed into the recess or groove 46.

The cylindrical tip member 45 is held concentrically of the outer jacket member 40 by means of a plurality of circumferentially spaced apart set screws 47. An inner rubber lining 48 is disposed within the interior of the nipple member 44, so as to prevent the sand from coming in direct contact with the metal forming the reduced nipple member 44. The jacket 41 has connected thereto a coupling nipple 49 which is adapted to be connected to a source of fluid supply, so as to permit the discharge of water into the chamber 50 formed within the jacket 41. If desired, the lining 48 may be formed of steel having a resistant characteristic to prevent undue abrasion from the sand passing therethrough.

In the use and operation of this nozzle the threads 13 of the jacket or nozzle member 10 are adapted to be connected to a source of sand supply under air or other fluid pressure, and the nipple 17 is adapted to be connected to a source of water supply. The nipple 49 is also adapted to be connected to a source of water supply for discharging water through the jet openings 42. As the sand moves through the axially aligned lining members within the body or jacket 10, the water discharged into the interior of the lining members from the nipple 17 will flow through the opening 23 in the jacket member 19.

The sand, being under air pressure, will move forwardly through the tip 39 and at the same time that the combined sand and water is being ejected from the tip 39 a substantially conical column of water or head will be discharged onto the work from the jet openings 42, so that the sand will wash off of the work after the sand has completed its abrasive action on the work.

What is claimed is:

1. In a sand blast nozzle including an outer body having a substantially frusto-conical forward end portion terminating in a cylindrical coupling member, a tip detachably connected with said coupling member and comprising a cylindrical outer tip member, a water jacket about the forward portion of said outer member, said jacket having a plurality of circumferentially spaced apart jet openings in the forward wall thereof inclined forwardly and inwardly to thereby provide a substantially conical head of water forwardly of said tip, an inner tip member including a cylindrical inner tip body, an annular flange carried by the inner end of said inner tip body, said outer tip member having an internal rearwardly opening groove in the rear end thereof within which said flange is adapted to engage, means holding said inner tip body concentric of said outer tip member, and a rubber lining within said inner tip body.

2. In a sand blast nozzle including an outer body having a substantially frusto-conical forward end portion terminating in a cylindrical coupling member, a tip detachably connected with said coupling member and comprising a cylindrical outer tip member, a water jacket about the forward portion of said outer member, said jacket having a plurality of circumferentially spaced apart jet openings in the forward wall thereof inclined forwardly and inwardly to thereby provide a substantially conical head of water forwardly of said tip, an inner tip member including a cylindrical inner tip body, an annular flange carried by the inner end of said inner tip body, said outer tip member having an internal rearwardly opening groove in the rear end thereof within which said flange is adapted to engage, means holding said inner tip body concentric of said outer tip member, and a rubber lining within said inner tip body, said flange having a depth greater than the width of said groove whereby a portion of said flange will project rearwardly of said outer tip member, thereby tightly maintaining said inner tip body within said outer tip member when the tip is coupled to said coupling member.

3. A tip for connection with the forward end of a sand blast nozzle comprising a cylindrical body formed with threads at the rear portion thereof for connection with the nozzle, a water jacket disposed about said cylindrical body adjacent the forward end thereof, said jacket including an outer cylindrical wall, a rear wall and a forward wall, said forward wall having a plurality of circumferentially spaced apart openings inclined forwardly and inwardly to thereby eject a plurality of inwardly extending water streams forwardly of the tip, a nipple carried by said jacket for connection with a source of water supply, an inner tip member within said body, means securing said inner tip member concentrically of said body, and a rubber lining in said inner tip member.

4. A sand blast nozzle tip comprising an outer cylindrical body provided with means at its inner end for attachment to the nozzle and provided with an annular recess in the inner end thereof, an inner cylindrical tip member, a flange at the inner end of said inner tip member engaging in said annular recess, means outwardly of said flange holding said inner tip member concentrically of said outer body, and a rubber lining in said inner tip member.

5. A sand blast nozzle tip comprising an outer cylindrical body provided with means at its inner end for attachment to the nozzle and formed with an annular recess in the inner end thereof, a water chamber carried by the outer end portion of said body, said chamber including circumferentially arranged jet openings inclined forwardly toward the axial center of said body whereby a substantially conical column of water may be projected forwardly of said body, means connecting said chamber with a source of liquid pressure supply, an inner cylindrical tip member, a flange at the inner end of said inner tip member engaging in said annular recess, means outwardly of said flange holding said inner tip member concentrically of said outer body, and a rubber lining in said inner tip member.

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