April 25, 1933. J. S. FULTON 1,905,698

SAND BLAST NOZZLE

Filed Nov. 11, 1932

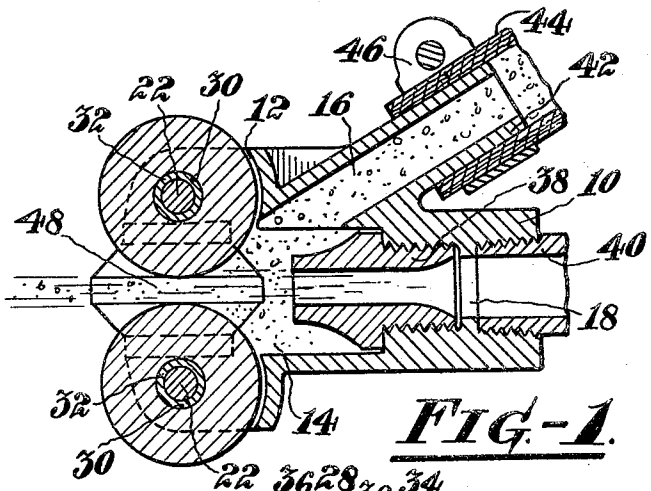


FIG.-1.

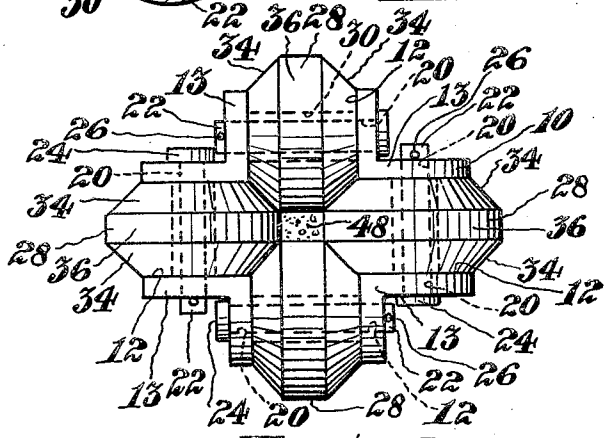


FIG.-2.

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UNITED STATES PATENT OFFICE

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SAND BLAST NOZZLE

Application filed November 11, 1932. Serial No. 642,198.

This invention relates to sand blasting apparatus, but more particularly to nozzles for a sand blasting device.

Those familiar with the art of sand blasting are aware of the fact that the abrasive action of the grit or sand on the nozzle produces very rapid deterioration of the nozzle which must be replaced relatively frequently. The useful life of an ordinary nozzle is not much more than five hours, and the necessity of replacement is a source of annoyance and expense.

It is an object of this invention to enable the construction of a nozzle which shall be inexpensive and durable.

Another object is the construction of a sand blast nozzle which will be of moderate weight, easily handled and effective in directing the sand blast accurately and efficiently against the material subjected to the blast.

Other objects will be in part obvious and in part pointed out hereinafter and are obtained by the device shown in the accompanying drawing, in which

Figure 1 is a longitudinal sectional view of the nozzle, and

Figure 2 is an end view showing the orifice and disposition of the walls and frame around the orifice.

Referring more particularly to the drawing, 10 designates the frame element of the nozzle. A cruciform opening 12 is formed in the forward end of the frame 10. The walls 13 of the opening 12 partially enclose a chamber 14 into which opens passages 16 and 18. The axes of the passages 16 and 18 form an acute angle with each other.

Apertures 20 are formed in the walls 13 to provide bearings for pins 22. The pins 22 are provided with heads 24 and are bored from the opposite end to receive a cotter pin or other fastening device 26. Rollers 28 are adapted to rotate on the pins 22. The rollers are pierced by an aperture 30 and a bearing 32 is placed in the aperture. The pins 22 form axles for the rollers 28.

The rollers may be made of any suitable material and one of the preferred materials is rubber since it is well known that rubber is a suitable material for resisting abrasion. However, the inventor does not limit the construction of the rollers to any specific material. The shape of the rollers is doubly coniform or more specifically two truncated cones 34 have a common cylindrical base 36 in the form of a right circular cylinder. The rollers are formed of such size and shape and so placed that the imaginary axes of adjacent cones intersect and the only contact between adjacent cones is contact on the common element of the conical surfaces which passes through the point of intersection of the axes. This well known principle of construction permits the conical surfaces to roll together without sliding friction.

The passage 18 is threaded to receive a nozzle 38 and a pipe 40. The passage 16 extends outwardly to form a nipple 42 which is adapted to couple with a sand conveying hose 44. The hose is clamped to the nipple 42 by a clamp 46.

The operation of the device is as follows: Sand or grit from a source not shown, fed through the passage 16, is entrained in a jet of air coming from the nozzle 38 and directed into the aperture 48 between the four rollers 28. The outgoing blast of air and sand causes the rollers to rotate and the peripheral velocity of the rollers is substantially equal to the velocity of the particles of grit or sand passing therebetween, as a result there is no relative velocity between the sand and rollers at the point of discharge and abrasion of the rollers is thereby eliminated.

Thus the objects hereinbefore referred to are attained.

I claim:

1. A sand blast nozzle comprising in combination, a frame, a conduit for pressure fluid, a conduit for abrasive material, a plurality of rotatably movable elements mounted in the frame, the walls of said rotatable elements forming an aperture which permits discharge of a mixture of sand and pressure fluid from the nozzle.

2. A sand blast nozzle comprising in combination, a frame, a conduit for pressure fluid, a conduit for abrasive material, a plurality of rotatably movable elements having

axles mounted in said frame, said rotatable elements being formed of abrasion resisting material and being so mounted that the walls and peripheries of the rotatable elements form an aperture to permit the discharge of a stream of pressure fluid and entrained abrasive material from the nozzle.

3. A sand blast nozzle comprising in combination, a frame, a conduit for pressure fluid, a conduit for abrasive material, an aperture to permit the discharge of a mixture of abrasive material and pressure fluid from the nozzle, the walls of the aperture being formed by a plurality of rotatably movable elements mounted on axles fixed in the frame in such a manner that the relative velocity between the walls of the discharge aperture and the abrasive particles is reduced to a minimum due to the rotation of the elements forming the nozzle.

In testimony whereof I have signed this specification.

JAMES S. FULTON.