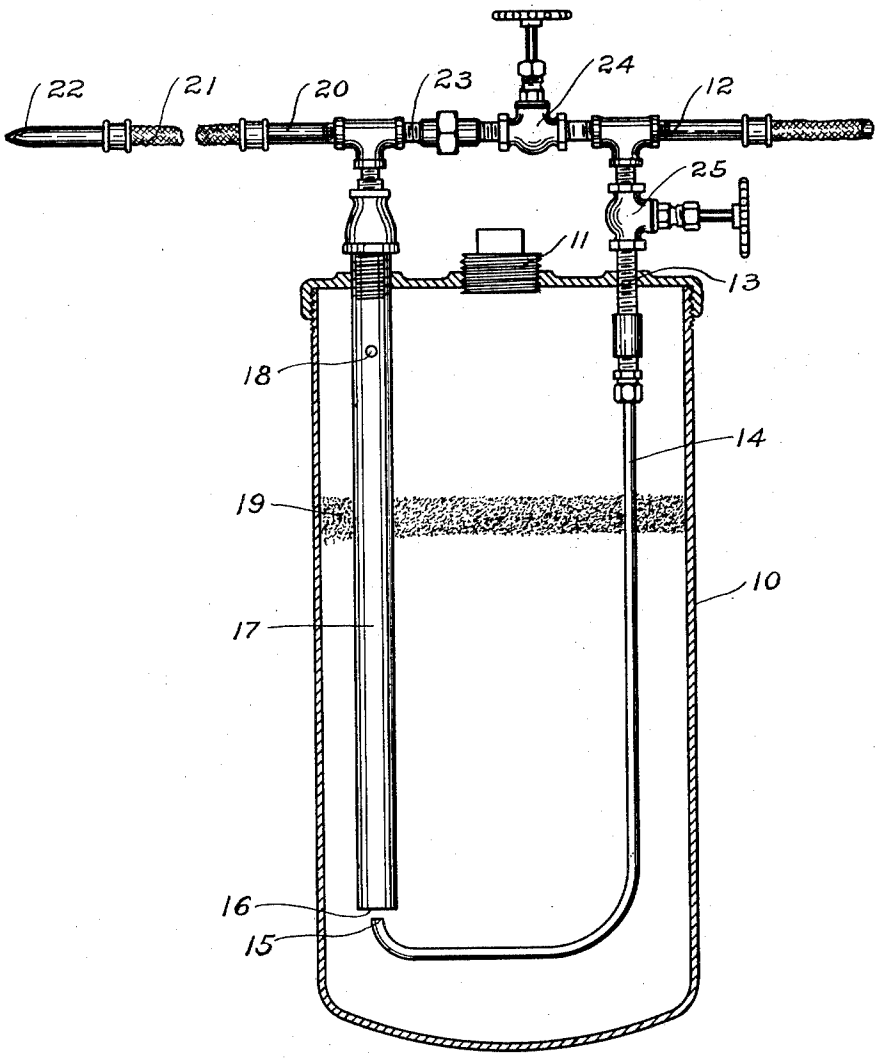
May 14, 1929. E. WYTCHERLEY 1,712,804

SAND BLAST DEVICE

Filed July 26, 1926



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Patented May 14, 1929. 1,712,804

UNITED STATES PATENT OFFICE

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SAND-BLAST DEVICE.

Application filed July 26, 1926. Serial No. 124,947.

This invention relates to a sand blast device for use in inscribing on stones, renovating stone of all descriptions, and for other uses wherein a combined blast of air and sand, or air and other material, is adapted to be mixed and projected under high pressure.

One of the objects of the invention is in the provision of a sand blast device of simple construction, the same being adapted to be used either as a portable or as a unitary structure.

Another object is in the provision of a sand blast device fashioned in a manner to insure, at all times, an even feed of sand.

Still another object is in the provision of a sand blast device comprising a reservoir, wherein there is such an arrangement of air and feed pipes as to insure the proper discharge of sand and air.

Other objects will appear in the following specification taken in connection with the annexed drawings, in which the single figure shows in side elevation, partially in section, my sand blast device which may be utilized either as a unitary or as a portable structure.

Referring to the drawings, I have shown the main reservoir 10, which may be of various capacities, as desired, the same having a suitable closure portion 11. A main air inlet pipe 12 is shown, air pressure being adapted to be applied to such air pipe by any pneumatic means desired. The air inlet pipe 12 enters the reservoir at the point 13, assuming a smaller diameter, as shown at 14, and is then angled in such manner that the discharge end 15 opens into the lower end 16, of a sand blast pipe 17, the latter being of considerably larger diameter than the air pipe.

The sand blast pipe 17 has an aperture 18 disposed adjacent the upper end thereof, said aperture opening into the upper portion of the reservoir at a point above the sand level, in the present instance shown at 19. This sand blast pipe is connected to a pipe 20, which carries the sand and air mixture through a flexible coupling 21 to a nozzle 22. An air by-pass is shown at 23, the same having a valve member 24 therein controlling the amount of air to be bypassed and therefore acting as a means for adjusting the blast. A second valve member 25 similarly acts as a means for adjusting the blast, as desired.

Referring to the operation of the present device, air under high pressure passes through the tube 12, and into the reservoir 10, through the tube 14. Means for controlling this air pressure is provided not only in the valve 24, but also in valve 25. The blast of air that is projected from the opening 15 picks up the sand around the lower end 16 of the pipe 17 and carries it upwardly through the said pipe, thence through the pipe 20, flexible coupling 21, and finally out the nozzle 22, said nozzle being restricted, as shown, in a manner to increase the speed of the projected sand and air particles propelled by the high pressure air.

In order to insure the forcing of the sand to the lower part of the reservoir 10, the aperture 18 is provided in the sand blast pipe, whereby a portion of the air blast passes through said aperture and exerts a downward pressure upon the sand, which is maintained at a level lower than this aperture. This pressure upon the upper side of the reservoir insures the collection of sand about the air blast nozzle 15. This aperture 18, as above described, not only provides for pressure upon the abrasive content in the reservoir, but also operates in a more important capacity to automatically compensate for the excessive amount of sand contained in the mixture that is being projected through the tube 17 and finally to the nozzle 22. In other words, there is a tendency for the sand which is picked up by the air pipe 15 and projected through the outlet pipe 17 to contain an excessive amount of sand and unless there were some means permitting escape of said sand, same would obviously finally accumulate at the small orifice in nozzle 22 and therefore prevent satisfactory operation of the device in that merely a small trickle of sand would be projected therefrom.

It may be stated at this time that unless some means is provided in an apparatus of the character described herein for automatically compensating for the excess amount of abrasive that is being rapidly projected through the pipe 17 that said device obviously would not operate efficiently. As a matter of fact, the feature of compensating for this excessive amount of abrasive is of paramount importance and the feature of exerting an air pressure upon the upper layer of the abrasive is of lesser importance

in view of the fact that the reservoir itself is, under ordinary conditions, adapted to contain approximately one thousand pounds of abrasive, which weight would force said abrasive about the ejector end of the outlet pipe 17 and in such manner that it would be readily picked up by the air inlet 15. Similarly, the fashioning of the sand blast pipe 17 of larger diameter than the air pipe, insures the desired sand feed into the air blast, with a consequent evening of the blast at the nozzle.

The various classes of work to which this device is adapted, makes necessary means for adjusting the amount of air delivered to the sand and hence valve members 24 and 25 have been provided to control the amount of air to be used. Adjustment of these valve members obviously results in the desired mixture of sand and air.

What I claim is:

1. In a sand blast device, in combination, a reservoir adapted to receive a supply of abrasive for a portion of its depth, a top on the reservoir, an air inlet projecting into said reservoir to a point below the level of the abrasive, and an outlet pipe disposed within the reservoir, the ejector end of the pipe lying adjacent the open end of the air inlet pipe, said outlet pipe projecting from the reservoir and being provided with means for removing an excess supply of abrasive from said pipe.

2. In a sand blast device, in combination, a reservoir adapted to receive a supply of abrasive for a portion of its depth, a top on the reservoir, an air inlet projecting into said reservoir to a point below the level of the abrasive, and an outlet pipe of larger diameter than the inlet pipe disposed within the reservoir, the ejector end of said pipe lying adjacent the open end of the air inlet pipe, said outlet pipe projecting from the reservoir and terminating in a nozzle, means being provided in said outlet pipe for discharging abrasive therefrom in excess of the normal capacity of the nozzle.

3. In a sand blast device, in combination, a reservoir adapted to receive a supply of abrasive for a portion of its depth, a top on the reservoir, an air inlet projecting into said reservoir to a point below the level of the abrasive, and an outlet pipe of larger diameter than the inlet pipe disposed within the reservoir, the ejector end of said outlet pipe lying adjacent the open end of the air inlet pipe, said outlet pipe passing through the space above the surface of the abrasive and projecting from the reservoir, means being provided in the outlet pipe at a point above the surface of the abrasive for providing air pressure in the space above the abrasive and for discharging abrasive material in excess of the normal capacity of the nozzle when the capacity of the nozzle has been reached.

4. In a sand blast device, in combination, a pressure tank adapted to receive a supply of abrasive for a portion of its depth, an air inlet projecting into said tank to a point below the level of the abrasive, and an outlet pipe of larger diameter than the inlet pipe disposed within the tank, the ejector end of said outlet pipe lying adjacent the open end of the air inlet pipe, said outlet pipe passing through the space within the tank above the surface of the abrasive and projecting from the tank, said outlet pipe being provided with an aperture at a point within the tank and above the level of the abrasive for supplying air pressure upon the abrasive content of the tank and for discharging abrasive material within the pipe in excess of the normal capacity of the nozzle when the capacity of the nozzle has been reached.

In testimony whereof I have hereunto affixed my signature.

EDWARD WYTCHERLEY.