Nov. 2, 1926. 1,605,617

R. RUEMELIN

SAND BLAST GUN

Filed June 3, 1921

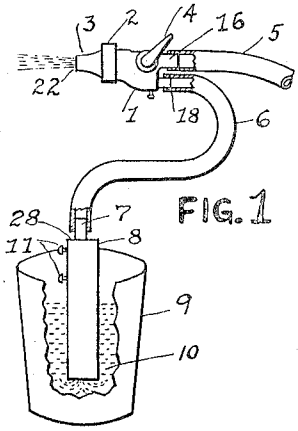


FIG. 1

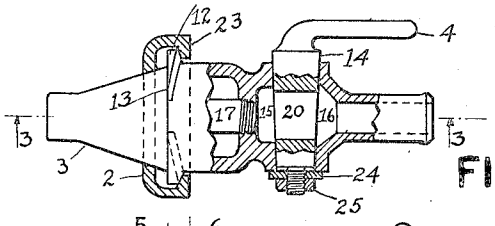


FIG. 2

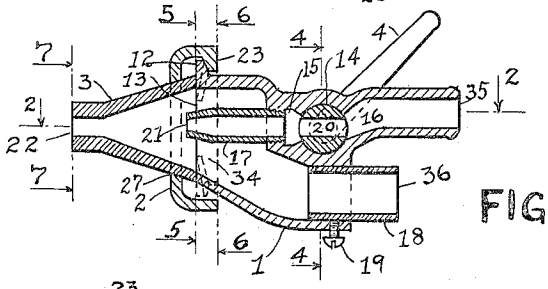


FIG. 3

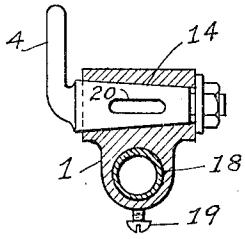


FIG. 4

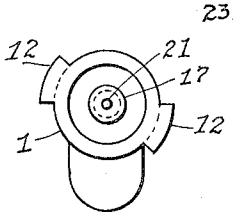


FIG. 5

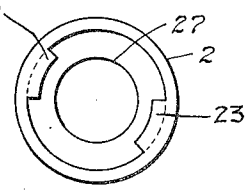


FIG. 6

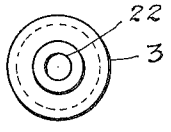


FIG. 7

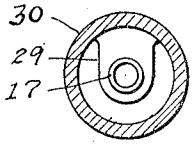


FIG. 8

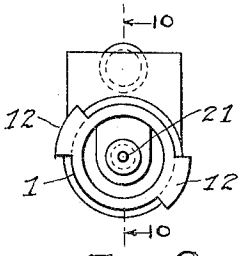


FIG. 9

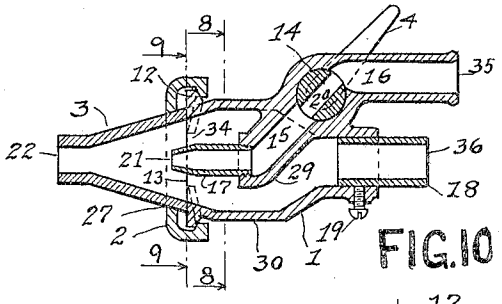


FIG. 10

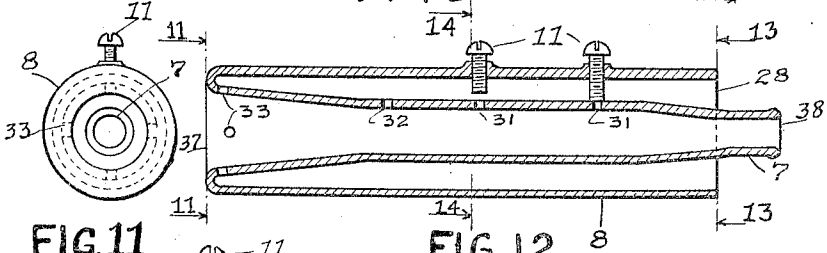


FIG. 11

FIG. 12

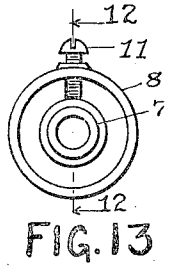


FIG. 13

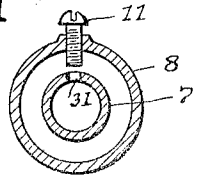


FIG. 14

INVENTOR

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BY Paul & Paul

ATTYS

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UNITED STATES PATENT OFFICE.

RICHARD RUEMELIN, OF STILLWATER, MINNESOTA.

SAND-BLAST GUN.

Application filed June 3, 1921. Serial No. 474,791.

This invention relates to improvements in sand-blast nozzles, or guns, as they are usually designated, and especially to devices of this kind wherein the sand is delivered by suction to the nozzle and discharged by compressed air or steam.

Devices of this kind are used in the industries for removing rust, dirt, scale, old paint, etc., from parts that it is desired to clean, or where it is desired to expose a clean surface. The principal objects of the invention are the provision of a quickly removable sand-blast tip, for renewal or inspection; flat machined surfaces between the base of the tip and the body of the gun, providing an air-tight trunk between these parts; a sand suction device which thoroughly mixes the sand with air to produce buoyancy of the sand, and an adjustable air inlet supply which is necessary to transport the sand to high elevations.

The invention consists generally in the constructions and combinations hereinafter described and particularly pointed out in the claims.

In the drawings:

Figure 1 is a side elevation of the assembled device, the parts being shown on a small scale;

Figure 2 is a partial sectional view and partial elevation of the nozzle, the section being taken on lines 2—2 of Figure 3;

Figure 3 is a longitudinal section on line 3—3 of Figure 2;

Figure 4 is a transverse section on line 4—4 of Figure 3, with the air-valve shown in section;

Figure 5 is an elevation looking at the end of the nozzle with the tip removed, the view being substantially on line 5—5 of Figure 3, looking in the direction of the arrows with the tip and lock nut removed;

Figure 6 is an elevation, looking towards the interior thereof substantially on line 6—6 of Figure 3, of the clamp for securing the removable tip to the body of the nozzle;

Figure 7 is an end view of the removable tip, looking in the direction of the arrows 7—7 in Figure 3;

Figure 8 is a transverse section looking in the direction of the arrows on the line 8—8 of Figure 10;

Figure 9 is an elevation of the end of the body of the nozzle with the tip and lock nut removed, looking in the direction of the arrows 9—9 in Figure 10;

Figure 10 shows a modified construction and is a longitudinal vertical section on line 10—10 of Figure 9;

Figure 11 is an end elevation of the inlet supply device, looking in the direction of the arrows 11—11 of Figure 12;

Figure 12 is a vertical section on line 12—12 of Figure 13;

Figure 13 is an elevation of the end of the inlet supply device, looking in the direction of the arrows 13—13 in Figure 12;

Figure 14 is a transverse vertical section on line 14—14 of Figure 12, looking in the direction of the arrow.

In the drawings 1 represents the body of the nozzle or gun, 3 the removable tip and 2 the clamp nut for clamping the tip 3 to the body 1. The end of the body upon which the tip fits is provided with a flat surface, and the large end of the tip 3 is provided with a corresponding flat surface which forms an air-tight joint with the end of the body. The end of the body is provided with oppositely extending lugs 12—12, provided with beveled surfaces. The locking nut 2 is provided with corresponding lugs 23 also provided with correspondingly beveled surfaces. By placing the tip in position so that the flat faces come together and form the seat 13, between the tip and the body, I provide an air-tight joint at this point. By means of the clamp nut 2, having lugs 23 engaging the lugs 12 on the body of the nozzle, these parts may be held firmly together as indicated in Figures 2, 3 and 10 of the drawings.

As shown in Figures 2 and 3 of the drawings, the opening in the nozzle body, that receives the sand hose connection 18, is located at one side of the body, and the hose connection 18 is provided with an opening or sand inlet 36 and is secured in position by means of a suitable set-screw 19. A hose 6, of any suitable material and of any suitable length, is connected to the hose connection 18, as indicated in Figure 1 of the drawings.

The nozzle body is provided with a tubular hose connection 35, having a port 16 extending therethrough in which is located a transverse valve 4, with an air port 20 extending therethrough. This valve is provided with an operating handle 4. A port 15 forms an extension of the port 16 so that when the valve 14 is in the position shown in Figures 2 and 3 of the drawings, the port 20 forms a connection between said ports 16

and 15. By turning the valve 14, by means of the handle 4, the port 20 may be partially or wholly closed.

A short tube or nipple 17 is connected to the nozzle body so as to register preferably with the port 15, and it is provided at its forward end with a discharge opening 21, which is substantially located centrally of the nozzle body and substantially in line with the opening 22 at the end of the tip 3.

A suitable hose 5 is connected to the tubular hose connection 35, as indicated in Figure 1 of the drawings. By this means a blast of compressed air, or steam, is forced through the ports 16, 20, 15, and the tube 17, emerging through the opening 21 and creating a suction through the hose connection 18 and the hose 6 arranged thereon.

In Figure 10 I have shown a slightly different arrangement in which the hose connection 18, for the sand delivery hose 6, is located centrally of the tip 3, and in which the hose connection 35 is arranged at one side of the nozzle body with the port 15 inclined so as to bring the tube 17 into a central position in the nozzle body.

I consider the arrangement of the parts shown in Figure 10 to be preferable to that shown in Figures 2 and 3, as the same is thereby brought directly into a central position in the nozzle body.

In Figure 12 of the drawings I have shown a suitable sand suction device, having a tube 7 to which the sand hose 6 may be coupled, as indicated in Figure 1 of the drawings. The tube 7 is surrounded by an outer tube 8, the tubes being connected or formed integrally at the lower end, as indicated in Figure 12, and being separated at the upper end, forming the air inlet opening 28. The inner tube 7 is provided with a series of air inlet openings 31, 32 and 33, as indicated in Figure 12 of the drawings. Adjustable screws 11 are preferably arranged in the outer tube in position to cover and close the openings 31 as indicated in Figure 12.

In operating the device a supply of sand 10 to be used for cleaning purposes, is placed in a suitable receptacle 9, and the tubular inlet device is dropped into said sand supply, allowing this device, however, to stand in a substantially upright position, with the open end of the tube 8 above the top of the sand, as indicated in Figure 1 of the drawings. Compressed air or steam is forced through the hose 5, the passage thereof being regulated by the valve 14, and is forced out of the opening 21 in the tube 17. The sand is, by the suction created, drawn into the nozzle body and through the space 34 around the end of the tube 17 and is forced out through the opening 22 with sufficient force to properly clean the surface to which it is applied.

The openings 33 near the lower end of the suction device permit air passing therethrough to create a lifting or buoyant effect on the sand extending into the lower end of the tubular inlet device assisting in the lifting of the same.

The hose 6 may be of any suitable length, as may also be the hose 5, the air-compressor, or steam generator, supplying compressed air or steam through the nozzle located at any desired point.

It is found in practice that the tips of the nozzles are worn out rather quickly by the action of the sand upon their inner surface. With my construction each nozzle may be provided with a supply of these tips, and the same may be quickly removed and replaced by proper manipulation of the clamping nut 2.

I do not limit myself to the details of construction as the same may be varied in many particulars without departing from my invention.

I claim as my invention:

1. The combination, with a sand blast gun, provided with a flexible hose for supplying a regulated blast of compressed air or steam thereto of a sand delivery hose, an intake device provided upon the suction end of said sand delivery hose, and comprising a tube having open ends with a series of perforations in its wall, means for closing the perforations in the wall of said tube, and a second tube surrounding said first named tube and spaced therefrom, the space between the tubes of said device being open at the upper end.

2. An intake device for a sand delivery hose comprising a tube open at its upper and lower ends and adapted for connection at its upper end to a sand hose, the lower end of said tube adapted to fit within a sand delivery receptacle, the wall of said tube having perforations therein, a second tube encircling said first-named tube and spaced therefrom, said space at the top of said tubes being open for the entrance of air and closed at the lower ends of said tubes, and means mounted in said second tube for adjustment therein to open or close the perforations in said first-named tube.

In witness whereof, I have hereunto set my hand this 31st day of May 1921.

RICHARD RUEMELIN.