March 20, 1934. L. D. PEIK 1,951,627

ROTARY SAND BLAST PRESSURE GUN

Filed Sept. 27, 1930

Fig. 1

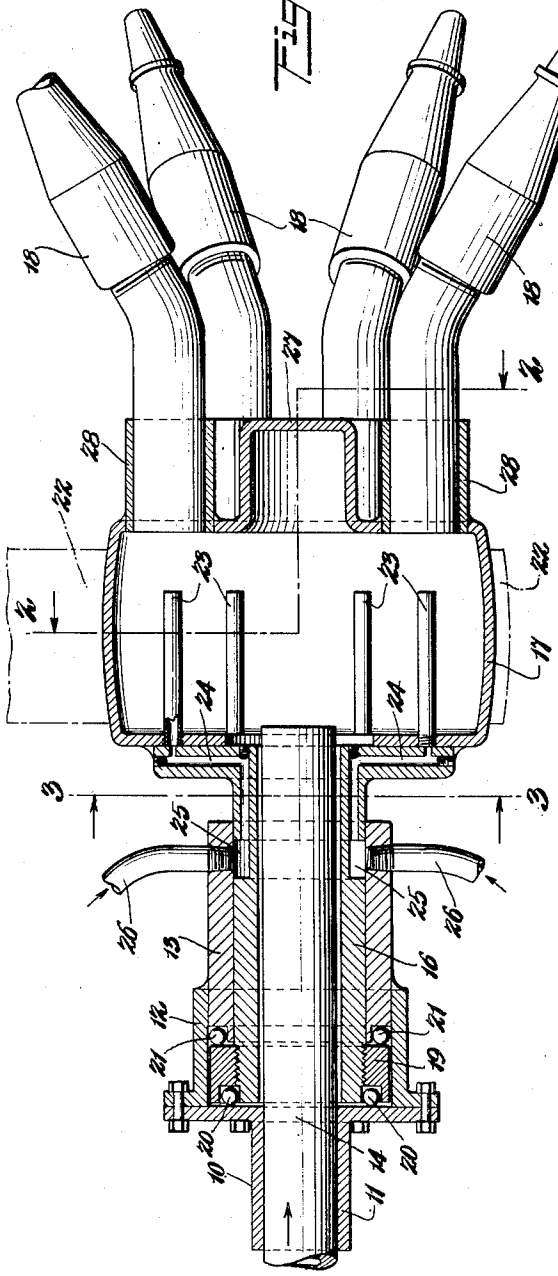


Fig. 3

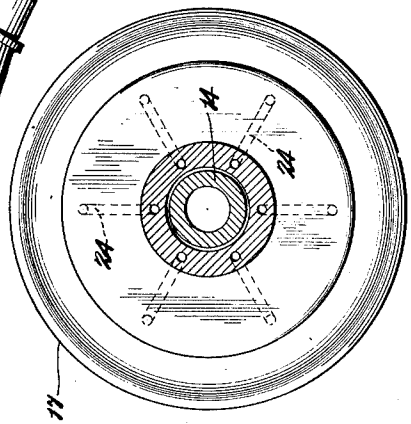
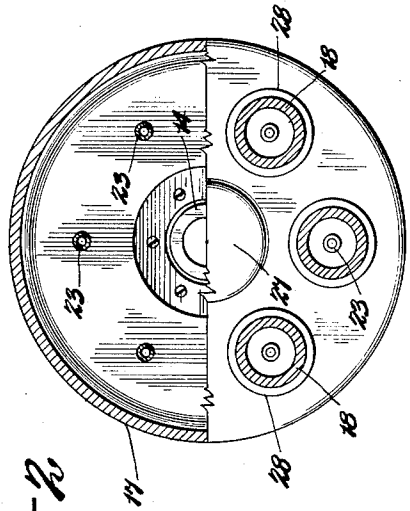


Fig. 2



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ROTARY SAND BLAST PRESSURE GUN

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8 Claims. (Cl. 51—11)

The invention relates in general to an equipment for cleaning castings and the like, and more particularly to a rotary gun for delivering a blast of sand or other abrasive.

According to one form which the invention may take a rotary gun for a sand blast system is provided which has a rotary reservoir supporting the several individual nozzles. A mixture of air and abrasive under pressure is supplied to the reservoir and the reservoir nozzles are rotated at a proper speed to evenly and uniformly distribute the abrasive among the several nozzles. If desired, a plurality of boosters may be used to increase the force of the blast, one booster being used for each individual nozzle. Also, the reservoir may be provided with a recess opposite the supply pipe which will fill up with sand and act as a buffer to prevent premature wearing of the rotary nozzle.

The invention also consists in certain new and original features of construction and combinations of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, the mode of its operation and the manner of its organization may be better understood by referring to the following description taken in connection with the accompanying drawing forming a part thereof, in which

Fig. 1 is a longitudinal section through the rotary nozzle; and

Figs. 2 and 3 are sections on the lines 2—2 and 3—3, respectively.

In the following description and in the claims parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

Like reference characters denote like parts in the several figures of the drawing.

In the drawing accompanying and forming part of this specification, a practical commercial embodiment of the invention is shown, but as such illustration is primarily for purposes of disclosure, it will be understood that the structure may be modified in various respects without departure from the broad spirit and scope of the invention as hereinafter defined and claimed.

Referring now to the drawing, the rotary composite nozzle comprises a stationary support 10 made up of sections 11, 12 and 13 in which is journalled a rotary element made up of sections 16, 17 and 18.

The sections 11 and 12 are provided with flanges which are bolted together as shown and the section 12 may be secured to the section 13 by welding or any other desired expedient. The section 13 acts as a bearing for the journal 16. A supply pipe 14 is supported by the section 11 and passes loosely through the journal 16 to the reservoir section 17. A mixture of air and sand, the air carrying sand in suspension, is adapted to be supplied to the supply pipe 14, as will be understood by those in the art.

The section 17 constitutes a drum shaped reservoir and is secured to the journal section 16 by welding or any other desired manner. The drum 17 has its outer circumference crowned as indicated to support a driving belt 22 which extends to suitable driving apparatus (not shown) for rotating the nozzles 18 at desired speed. It is obvious that other driving means may be also used to rotate the reservoir 17. The journal 16 has threaded thereto a collar 19 which has an annular groove seating a plurality of balls 20. The section 13 also has an annular groove seating a plurality of balls 21. The balls 20 and 21 act as axial thrust bearings for the rotary nozzle.

The reservoir 17 is provided with a plurality of tubular extensions 28 disposed circularly and parallel to the axis of the supply pipe 14. Secured in these members 28 are the individual nozzles 18 which may be arranged in the directions shown.

In the embodiment illustrated a plurality of booster pipes or nozzles 23 are threaded into the back wall of the drum 17 and are symmetrically arranged with respect to the several nozzles 18. These booster nozzles 23 communicate through passages 24 with an annular air chamber 25 to which air under pressure is supplied by the pipes 26.

Opposite the supply pipe 14 the front wall of the reservoir 17 is provided with a recess 27 for the purpose of providing a buffer to take the force of the air and sand which comes out of pipe 14 at a high velocity. This prevents undue wearing of the reservoir 17 at this point.

To use the apparatus above described it will be understood that a mixture of sand or other abrasive and air will be supplied to the pipe 14 under suitable pressure and air alone will be supplied to the pipes 26 under suitable pressure. Since the abrasive particles and air are already mixed before being supplied to the rotary nozzle or gun, the mixture may be said to be pre-carburetted. The reservoir 17 will be rotated by the belt 22 and the work will be presented in front

of the individual nozzles 18 in best position for obtaining the maximum cleaning action. For best operation the reservoir must be rotated at proper speed which in some cases may be in the neighborhood of sixty revolutions per minute. In some instances, especially with small sizes, it may not be necessary to use the auxiliary booster air supply, and indeed, if desired, the auxiliary nozzles 23 and other parts for providing the booster air supply may be omitted.

It will be understood that the current of air under pressure carrying the sand in suspension issues from the pipe 14 with considerable velocity and hits upon the opposite wall of the reservoir with considerable force. The recess 27 soon fills up with spent sand which acts as a buffer or wearing surface preventing the metal of the reservoir from being eaten through at this point.

Thus a rotary nozzle has been described which has excellent cleaning action. It not only delivers the abrasive with maximum force, but it delivers it over a large area. Furthermore, the device is long-wearing and it is not liable to get clogged up due to wet sand or other causes. Furthermore, the great turbulence of the abrasive particles in the chamber 17, together with the rotation of the reservoir 17 at proper speed assists in an equal and uniform distribution of the blast among the several nozzles. Furthermore, the rotary nozzle may be used in any position, either vertically or horizontally. When the booster nozzles are used the additional air serves to give an additional impetus to the blast streams, which provides a more effective blasting action in many cases, particularly with large sizes. It will, of course, be understood that the proper relations must be maintained between the pressure supplied to pipe 14 and that supplied to pipes 26 to prevent any backing up of the sand.

It will be noted that the individual nozzles 18 do not rotate on their own axis but are fixed to the reservoir 17 to revolve therewith about the main axis of the reservoir by the driving action of the belt 22.

While certain novel features of the invention have been shown and described and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes in the forms and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. In a rotary scrubbing device, a plurality of revolving nozzles, a common rotary reservoir serving said nozzles, means supplying a pre-carburetted mixture of air and abrasive particles to said reservoir under pressure, and boosting nozzles for supplying air alone to boost said mixture, said boosting nozzles comprising individual conduits in line with the several nozzles and located within said reservoir, and means for rotating said reservoir and nozzles about a common axis.

2. In a scrubbing device, a plurality of revolving nozzles, a common reservoir serving said nozzles, means supplying a pre-carburetted mixture of air and abrasive particles to said reservoir under pressure, and boosting means for supplying air alone to said nozzles to boost said mixture, and means for rotating said reservoir and nozzles about a common axis.

3. In a device of the character described, a reservoir, a supply pipe entering the back wall of said reservoir, a plurality of nozzles leaving the front wall of said reservoir opposite said supply pipe, said reservoir having a recess opposite said supply pipe to hold abrasive particles and thereby act as a buffer to protect the wall of said reservoir from the force of the blast issuing from said supply pipe.

4. In a rotary scrubbing device, a plurality of revolving nozzles, a rotary common reservoir serving said nozzles, means supplying a pre-carburetted mixture of air and abrasive particles to said reservoir under pressure, and boosting means for supplying air alone to boost said mixture, said boosting means comprising individual conduits for the several nozzles.

5. In a rotary blast gun, a turbulence chamber, a plurality of revolving nozzles communicating with said chamber, said nozzles rotating about an axis parallel to the inlets to said nozzles, a supply pipe on said axis and entering said chamber opposite said nozzles, and means for feeding said supply pipe with a pre-carburetted mixture of air and abrasive particles.

6. In a rotary sand blast gun, a stationary support, a drum shaped casing having a journal portion journaled in said support to rotate about the axis of said casing, a main supply pipe passing through said support into said casing on said axis, more than two discharge nozzles circularly arranged on said casing having inlets parallel to said axis and symmetrically spaced about said axis, a plurality of booster pipes supported by the back wall of said casing in line with said inlets, there being an annular air ring between said support and journal portion, passages in said drum connecting said air ring and booster pipes, a booster supply pipe connected to said support and communicating with said air ring, and means for rotating said drum in the neighborhood of 60 R. P. M.

7. In a rotary sand blast gun, a stationary support, a drum shaped casing having a journal portion journaled on said support to rotate about the axis of said casing, a main supply pipe passing through said support into said casing on said axis, more than two discharge nozzles circularly arranged on said casing having inlets parallel to said axis and spaced about said axis, a plurality of booster pipes supported by the back wall of said chamber in line with said inlets, there being an annular air ring between said support and journal portion, passages in said drum connecting said air ring and booster pipes, and a booster supply pipe connected to said support to supply said air ring.

8. In a rotary sand blast gun, a turbulence chamber, a plurality of revolving nozzles communicating with said chamber, said chamber rotating with said nozzles, said nozzles rotating about an axis parallel to the inlets to said nozzles, a supply pipe on said axis and entering said chamber opposite said nozzles, said chamber having a recess opposite said inlet pipe to act as a buffer, means for rotating said nozzles at about 60 R. P. M., and means for supplying said supply pipe with a mixture of air and sand under pressure.

LOUIS D. PEIK.