

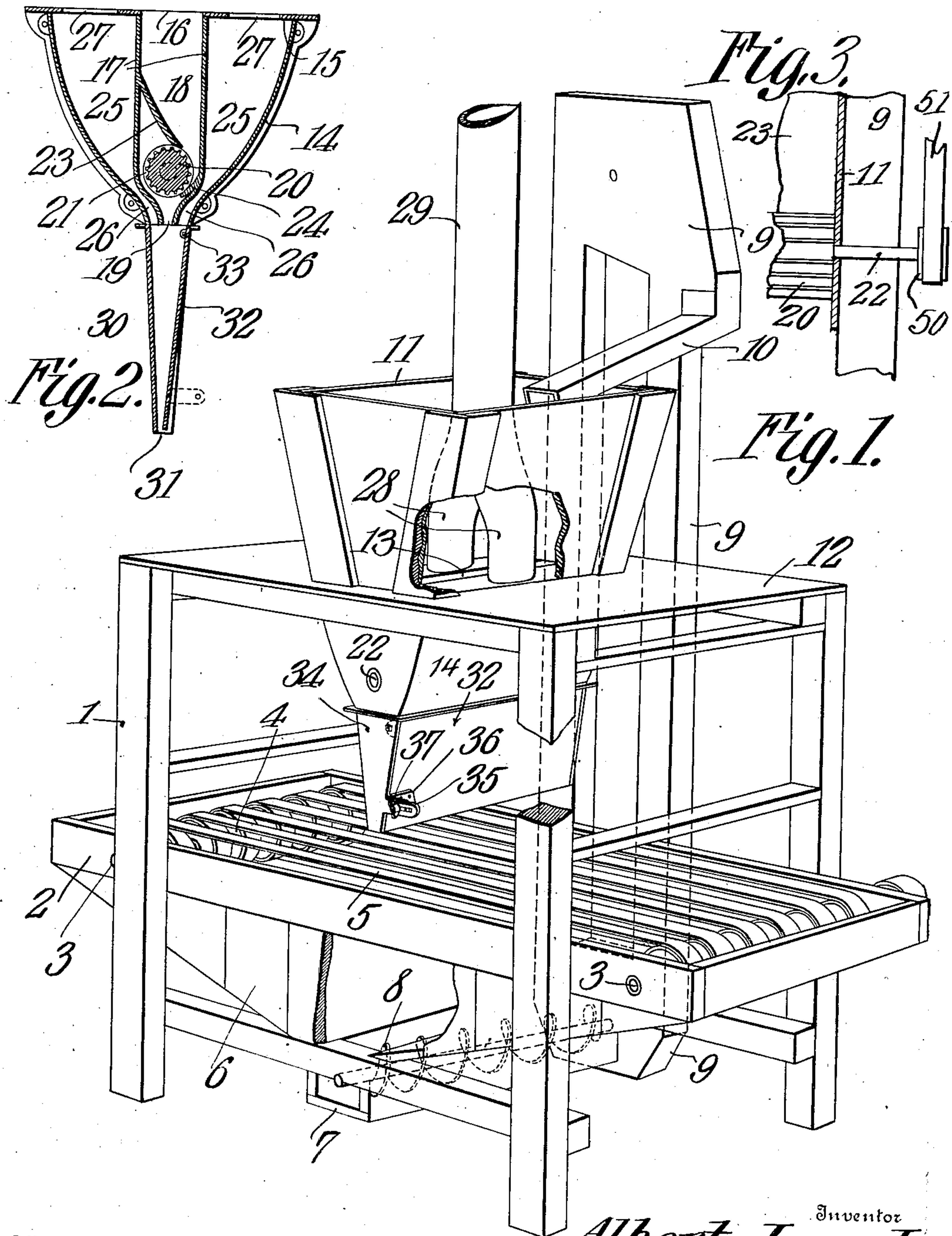
No. 894,272.

PATENTED JULY 28, 1908.

A. JORN, JR.

SAND BLAST APPARATUS.

APPLICATION FILED JAN. 18, 1908.



Witnesses

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SAND-BLAST APPARATUS.

No. 894,272.

Specification of Letters Patent.

Patented July 28, 1908.

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To all whom it may concern:

Be it known that I, ALBERT JORN, Jr., a citizen of the United States, residing at Waukegan, in the county of Lake and State of Illinois, have invented a new and useful Sand-Blast Apparatus, of which the following is a specification.

This invention has reference to improvements in sand blast apparatus, and is designed more particularly for use in cleaning castings and other articles.

The invention comprises a sand blast apparatus in which the sand after having been projected upon the articles to be cleansed is again conveyed to the blast apparatus to be used over again, and this use continues so long as the sand remains sharp enough for the purposes for which it is used.

The invention includes means for directing the sand under air pressure against the articles to be cleansed, and in this respect it consists of a nozzle with an adjustable mouth, and this nozzle is in line with the delivery end of a hopper, which end contains a grooved roller kept in rotation so long as the apparatus is in use to carry charges of sand from the supply in the hopper to a point where it may be dropped in successive charges into the path of an air blast delivered into the nozzle in a direction to carry the sand through the mouth of the nozzle and into contact with the articles to be cleansed, the nozzle providing means whereby the sand blast may be limited to a circumscribed area.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings forming a part of this specification, in which drawings—

Figure 1 is a perspective view, with parts in section and other parts omitted, of the sand blast apparatus, and Fig. 2 is a vertical cross section through the nozzle and adjoining parts. Fig. 3 is a detail view illustrating one means for rotating the sand feeding drum.

Referring to the drawings, there is shown a framework 1 in which is located another frame 2, at the ends of which latter are journaled transverse shafts 3 carrying rollers 4, and these rollers serve as supports for endless belts 5 upon which the articles to be treated are placed. As shown in the drawings, the framework 1 is an open frame, but

in practice this framework and so much of the frame 2 and belts 5 as are included in the limits of the frame 1 are suitably inclosed, and the interior is suitably protected by a rubber lining and the belts are also of rubber or rubber lined, as is the usual practice in sand blast apparatus. Below the frame 2 there is formed a receptacle 6 having its bottom inclined toward a central point where it discharges into a trough 7 containing a suitable screw conveyer 8 leading to the bottom of an elevator structure 9. This latter structure is only shown in outline in the drawings since the elevator may be of the ordinary construction by which the sand delivered by the conveyer 8 is elevated along one limb of the conveyer frame, and is ultimately delivered to a spout 10 from which it gravitates into a hopper 11 fast on the platform 12 carried by the frame 1. The platform 12 is formed with a longitudinal slot 13, and immediately below the platform 12 there is located a receptacle 14 which may be made of sheet metal if so desired. This receptacle 14 is formed with a top 15 which may be secured directly beneath the platform 12 and extending longitudinally through the top 15 is a slot 16, on opposite sides of which are two downwardly-directed parallel walls 17 inclosing a chamber 18. The lower end of the walls 17 approach each other to form a contracted throat 19, and above this throat the chamber 18 has within it a drum 20 provided with a circumferential series of longitudinal grooves 21. The drum 20 is mounted upon a shaft 22 having bearings in the end walls of the casing 14, and at one end this shaft may be provided with suitable means for imparting rotation thereto at the desired speed. One means for rotating the drum is shown in Fig. 3 and comprises a pulley 20^a mounted on one end of the drum shaft around which passes a belt 20^b driven by a pulley on a constantly rotating shaft forming a part of the apparatus. Within the chamber 18 is a deflector board 23 for directing sand received from the hopper 11 through the slots 13 and 16 into the compartment 18 toward one side of the drum 20, and the sand is prevented from passing by said drum and so into the throat 19 by a longitudinal lip 24 closely embracing the drum near the lower edge thereof. Sand received from the hopper and lying in the compartment 18 is carried into that portion of the compartment in direct communication

with the throat 19 by the rotative movement of the drum 20, which latter, as viewed in Fig. 2, will in action rotate counter clock wise. Assuming the rotation to be continuous, it is
 5 seen that each groove 21 will carry a charge of sand from one section of the compartment 18 to the other section by the deflector 23, and a continuous series of charges will gravitate through the throat 19.

10 Between the outer walls of the casing 14 and the walls 17 are formed chambers 25 one on each side of the compartment 18, and the outer walls of the casing 14 are made to approach toward their lower ends into
 15 close relation with the approached walls 17 adjacent to the throat 19, thus forming on each side of the throat 19 other throats 26 in communication with the respective chambers 25. Through the top 15 are openings
 20 27 one for each chamber 25, and these openings receive the legs 28 diverging from an air conduit 29 coming from a suitable source of air pressure and passing into and through the hopper 11 to the openings 27.

Below the throats 19 and 26 and in free communication therewith, is a nozzle 30, the walls of which approach each other toward the discharge end 31. One side wall 32 of the nozzle 30 is hinged thereto at
 30 its upper end as indicated at 33, so that the area of the discharge end 31 may be regulated at will. Any suitable adjusting means may be provided for this purpose. In the drawings one of the end members 34 of the
 nozzle 30 is provided with a slotted ear 35, and a bracket 36 is attached to the movable side 32. A bracket is provided with a
 40 threaded pin extending through the slot in the ear 35, and this pin receives a wing nut 37 by means of which the side 32 may be adjusted, as desired, to determine the size of the opening 31. The adjusting means shown and described are to be taken simply as indicative of any desired adjusting means and not as constituting the only type of adjusting means for this purpose.

Suppose, now, that the hopper 11 is charged with sand and that through suitable driving means the shafts 3, the conveyer
 50 8, the elevator within the elevator casing 9 and the drum 20 are set in movement all in the proper time relation and that air is being fed under suitable pressure through the conduit 29. The articles to be cleansed are placed upon the belts 5 and are slowly conveyed beneath the open end of the
 nozzle 30. In the meantime the drum 20 is rotated in the proper direction to carry sand lodged in the grooves 21 under the
 60 lower end of the deflector 23 and ultimately to a position where the sand gravitates from these grooves and falls through the throat 19. The streams of air entering the chambers 25 pass forcibly through the throats 26 and into the nozzle 30. At this point the

sand is caught by the falling air stream and forcibly projected through the nozzle opening 31 and onto the articles to be treated as they pass slowly under the lower end of the
 nozzle while resting upon the belts 5. After
 70 the sand has performed its work it falls through the spaces between the belts, and ultimately finds its way into the trough 7 where it is carried by the conveyer 8 into the lower end of the elevator structure 9 to
 75 be carried to the top of the latter and delivered again into the hopper through the spout 10. The size of the stream passing out through the nozzle and in a measure the speed of the stream of sand-laden air, may
 80 be determined by adjusting the side 32 to increase or decrease the area of the opening 31, and this may be done while the air pressure in the pipe or conduit 29 has been maintained practically constant. In machines of this character it is desirable that
 85 the same prime mover propel the various parts including the blower by means of which air pressure is maintained, and consequently it is advantageous to regulate the
 90 force of projection of the stream of sand laden air by constricting or expanding the nozzle opening rather than changing the air pressure by varying the speed of the blower. By adjusting one side of the nozzle so as to
 95 vary the relative inclination of the nozzle sides, the abrasive action of the sand upon the walls of the nozzle is practically annihilated.

While from the foregoing description it
 100 has been stated that the machine is especially adapted for the cleaning of castings, it is to be understood that it may be used for sand blasting glass either plain or in ornamental designs, or the sand blasting apparatus may
 105 be used for any other purpose for which it is adapted.

What is claimed is:—

1. In an air blast apparatus, a sand receptacle, a delivery nozzle, rotatable means between the sand receptacle and the delivery
 110 nozzle for delivering sand to the nozzle in predetermined successive quantities, and means for directing air under pressure into the nozzle in the path of the sand delivered
 115 thereinto.

2. In a sand blast apparatus, a sand receptacle, a delivery nozzle, a chamber between the sand receptacle and nozzle, a longitudinally grooved rotatable drum within the
 120 intermediate receptacle for delivering sand therefrom to the nozzle in successive charges, and means for directing air under pressure to the nozzle adjacent to the point of entry of the air blast thereinto.
 125

3. In a sand blast apparatus, a means for delivering successive charges of sand to the air blast comprising a compartment for the sand, a longitudinally grooved rotatable
 130 drum therein, a deflector for directing the

sand in the compartment to one side of the axis of the drum, and means for preventing the sand from gravitating by the drum.

4. In an air blast apparatus, means for directing a sand-laden air blast to the articles to be treated comprising a casing having its lower end contracted, division walls within the casing having their lower ends approaching and constituting a delivery throat at their contracted ends and also coacting with the walls of the casing to constitute other throats adjacent to the first-named throat, a nozzle leading from the said throats, a longitudinally-grooved rotatable drum between
15 the division walls in the casing, a deflector

plate leading from one side wall of the casing to a point beyond the vertical plane of the axis of the drum, a lip underriding the drum for preventing the escape of sand by the drum, and means for directing air under 20 pressure to the throats on each side of the throat communicating with the space between the division walls.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature 25 in the presence of two witnesses.

ALBERT JORN, JR.

Witnesses:

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ELMER V. ORVIS.