

R. RUEMELIN.
SAND BLAST APPARATUS.
APPLICATION FILED JUNE 4, 1920.

1,415,403.

Patented May 9, 1922.
2 SHEETS—SHEET 1.

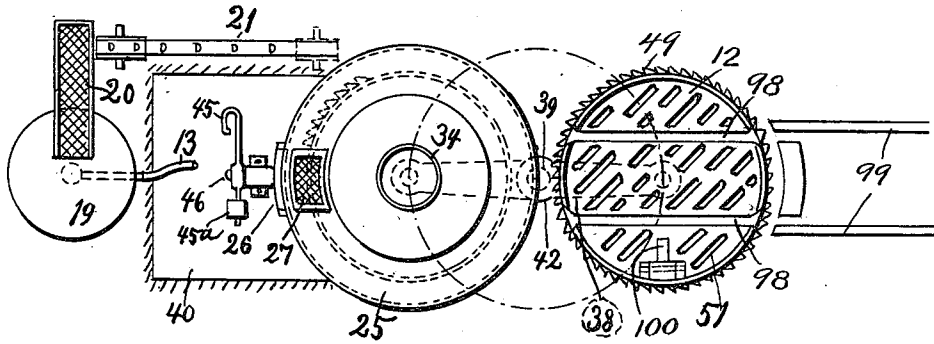


FIG. 1.

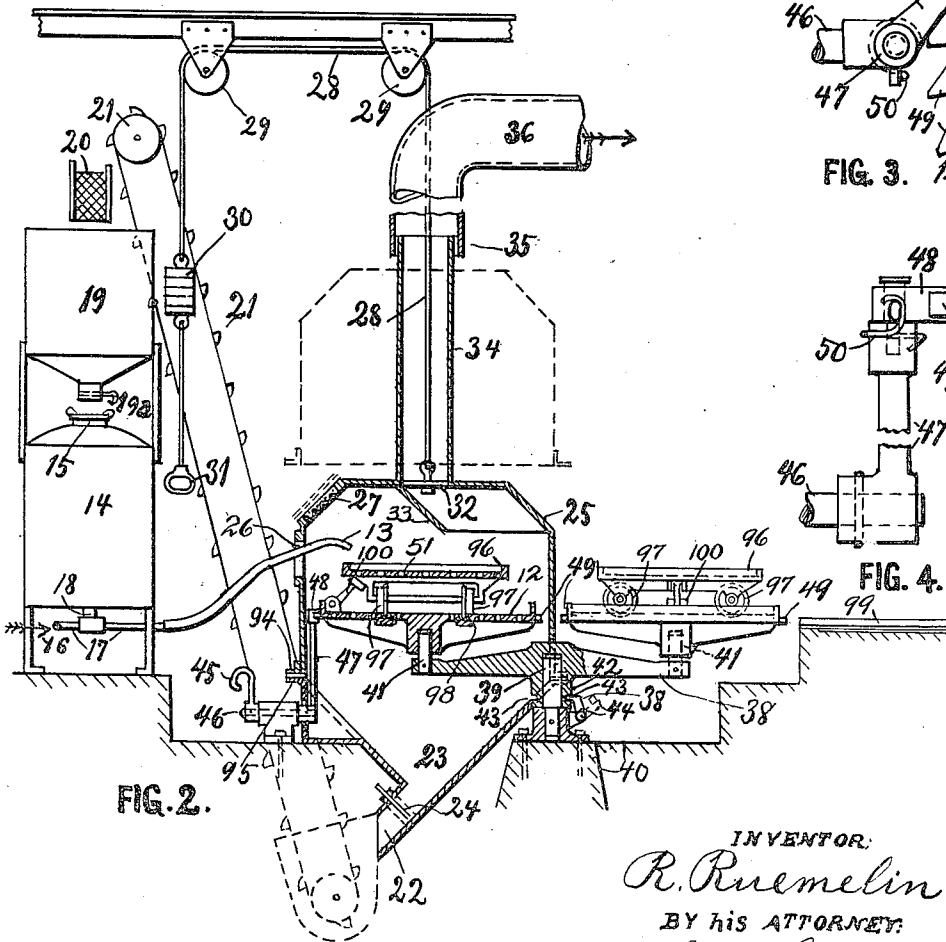


FIG. 2.

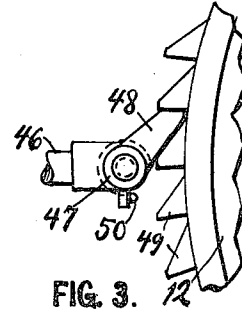


FIG. 3.

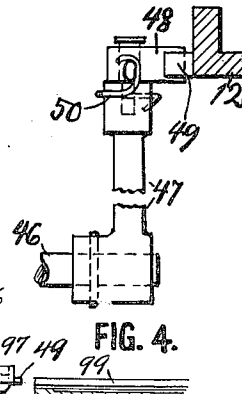


FIG. 4.

INVENTOR:
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BY his ATTORNEY:
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2 SHEETS—SHEET 2.

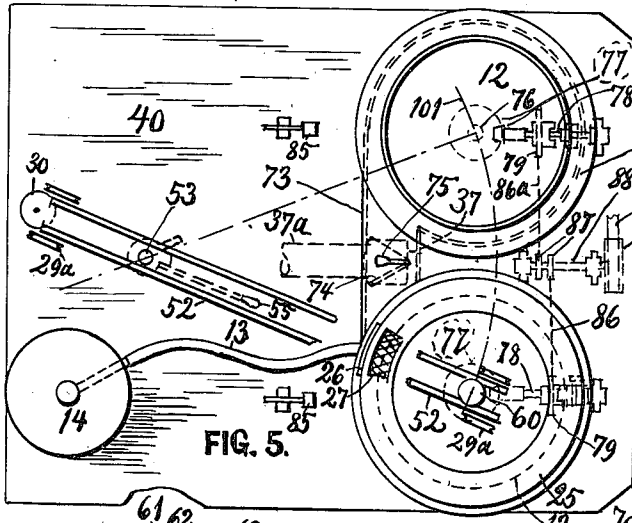


FIG. 5.

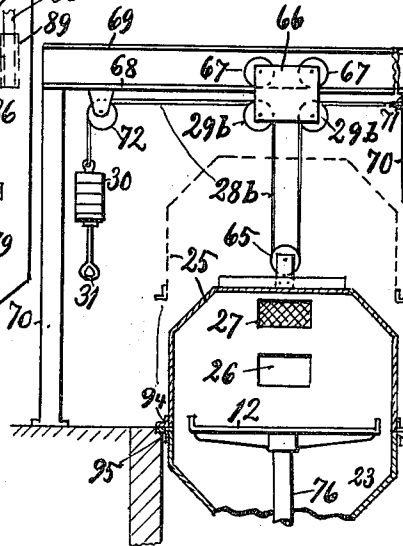


FIG. 7.

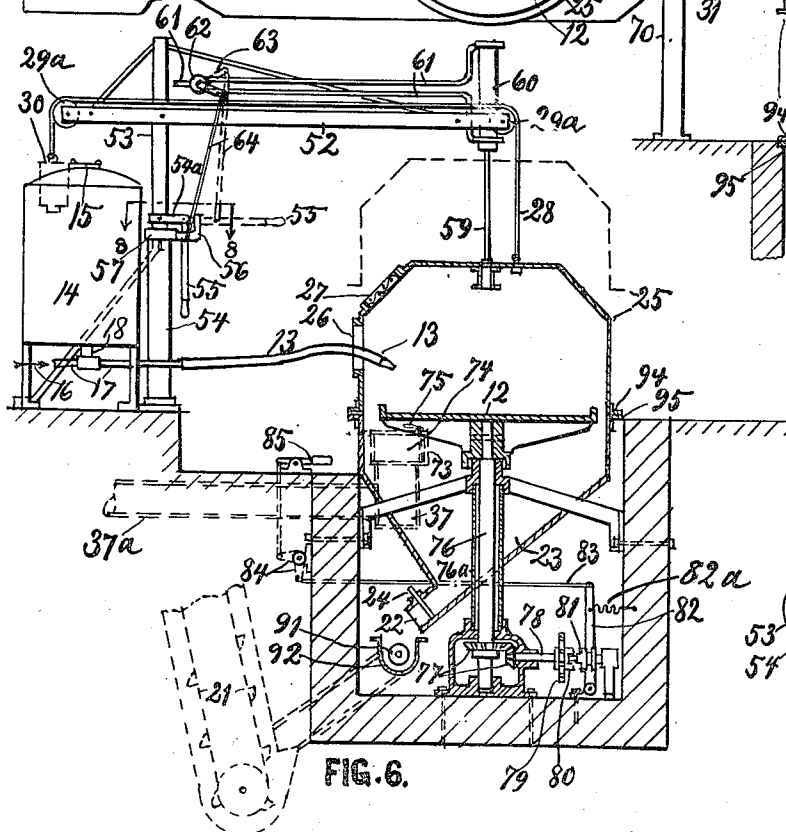


FIG. 6.

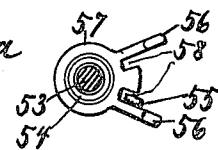


FIG. 8.

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UNITED STATES PATENT OFFICE.

RICHARD RUEMELIN, OF STILLWATER, MINNESOTA.

SAND-BLAST APPARATUS.

1,415,403.

Specification of Letters Patent.

Patented May 9, 1922.

Application filed June 4, 1920. Serial No. 386,570.

To all whom it may concern:

Be it known that I, RICHARD RUEMELIN, a citizen of the United States, residing at Stillwater, in the county of Washington and State of Minnesota, have invented a new and useful Sand-Blast Apparatus, of which the following is a specification.

My invention relates to sand blast machines, for cleaning castings by blowing sand against them upon a slowly rotated perforated table. The object is to so improve said kind of machines that they will be more efficient and easy to operate and more sanitary than those heretofore employed. This and other objects I attain by the novel construction and combinations of parts illustrated in the accompanying drawing in which:—

Fig. 1 is a top or plan view of the main parts of a sand blast apparatus embodying my invention in a simple and general way. Fig. 2 is a partly sectional side elevation of Fig. 1, with a lifting means for a hood of the machine added. Fig. 3 is a fragmentary plan view showing in detail a portion of the supporting table for the castings to be cleaned and a simple means for rotating said table. Fig. 4 is Fig. 3 in elevation. Fig. 5 is a top view of the apparatus modified. Fig. 6 is a partly sectional side elevation of Fig. 5. Fig. 7 is a portion of Fig. 6 with many parts omitted, showing a modification in the hood lifting and moving means. Fig. 8 is a detail section on the line 8—8 in Fig. 6 with the bracket 54^a omitted.

Referring to the drawing by reference numerals, I will first mention the parts which are common in most sand blasting machines, namely a rotatable table 12 upon which the castings are placed and the table slowly rotated while sand is being blown onto them from a hose 13 which is suitably connected with a sand tank 14 having a lid 15 closing its top, while compressed air 16 is blown through pipe 17 and the hose so as to carry with it the sand passing down the pipe 18. The tank 14 is filled or supplied periodically with sand from a hopper 19, having a valve 19^a, and which when the machine is in operation receives sand through a grate or screen 20 to which the sand is constantly carried by an elevator 21 from the spout 22 of a pit 23, into which the sand

gathers from the perforated table 12, 24 being a valve to admit the sand to the elevator. In the common sand blasting machines so far described only half of the table 12 and the castings placed on it are covered by a housing or shield, so that the sand and dust rebounding from or blown over the casting spread into the air that must be inhaled by the operator, which of course is very unsanitary and dangerous. The table is also usually so arranged that much time is wasted by stopping it and keeping it idle while emptying it and then supplying it with the next lot of castings to be cleaned. All of these difficulties and objections I overcome by various improvements as follows:

In all the views a cylindrical hood 25 covers the entire table 12 and the castings placed on it so no sand can be blown into the room where the operator stands while introducing the hose 13 through an aperture 26 and looking into the hood through a fine wire cloth 27.

To cover or uncover the castings on the table the hood 25 is moved vertically by a suspension cable 28 guided over pulleys 29 overhead and having a counter balancing weight 30 and a handle 31 (see Fig. 2). In the last mentioned view is also shown that the hood is provided with a central top aperture 32 having an inclined baffle plate 33 below it. From the aperture 32 extends a vertical tube 34, which is slidable in a tube 35 and the latter has a horizontal portion 36 through which a suction fan (not shown) draws the dust from within the hood 25. As a modification of the pipe 34, 36, in Figs. 1 and 2, I have shown in Figs. 5 and 6 that a dust suction pipe 37—37^a may be extended from the pit or base hopper 23 to the suction fan.

In most cases I employ two tables 12, so that one of them may be operated under the single hood 25 while the other is being emptied and reloaded with castings. Such exchanging of the hood from one table to the other may be carried out in various modified manners. Thus in Figs. 1 and 2 a beam 38 is mounted to rotate on a vertical stud 39 fixed in a suitable base 40, said beam carries two upright studs 41, on which the two tables 12 are centrally journaled. The beam has a hub 42 with two radial notches,

43, in which a catch 44 may engage alternately and thus hold either table centrally below the hood.

In Figs. 1 and 2, 45 designates a foot lever fixed on a rock-shaft 46 having a weight 45^a and a radial arm 47 carrying a dog 48, which when the lever is operated engages the teeth 49; 50 is a spring to hold the dog in engagement with the teeth of the table. Each table is formed with perforations 51 for the downward escape of the sand after acting on the castings to clean them.

In the modification shown in Figs. 5 and 6 the two tables 12 remain always in their respective positions and the hood is suspended from a derrick boom 52, projecting horizontally from a rotatable mast 53, which is journaled in a base 54, and carries in a bracket 54^a a downwardly foldable radial lever 55, by which to swing the derrick until the lever stops against either one of two horns 56 (see Fig. 8) of a collar 57 fixed at the top of the base or tubular post, 54. When the lever is against one of said horns the hood is directly over one of the tables and may be locked in that position by swinging the lever 55 into one of the notches 58 in the collar 57.

In Fig. 6 is also shown that for large hoods 25 the cable 28 and pulleys 29^a and weight 30 are only to counter balance the hood, but the hood is raised and lowered by a piston rod 59 from a piston in an air cylinder 60 which receives compressed air into either end from piping 61 and a valve 62; the latter having its handle 63 connected by a rod 64 to the lever 55, which lever thus serves the four purposes of swinging, stopping, and locking the derrick and also controlling its hoisting power.

In the modification Fig. 7 is shown that the hood may be raised and lowered by a cable 28^b having its middle portion taken underneath a rope sheave 65 at the top of the hood, and over two sheaves 29^b, mounted in a trolley frame 66, the latter having wheels 67 rolling upon the base flanges 68 of a horizontal beam 69 fixed on two posts 70. One end of the cable is fixed at 71 and the other is passed over a sheave 72 and attached to the counterbalancing weight 30.

In Fig. 5 is shown that the two pits 23, one below each table 12, are connected by a dust removing tube 73, from which the suction tube 37^a extends, and at the junction of said tubes is a valve 74 having a handle 75 by which it may be set in position to connect with the suction pipe the pit 23 below which-ever table 12 is in operation.

In the form shown in Figs. 1 and 2 the table in operation or service is rotated slowly by the foot lever 45, or in large machines said lever may be automatically operated by giving it any suitable connection with the elevator driving mechanism. And

in Figs. 5, 6, 7, where the tables have no planetary movement, each of them may be fixed to an upright shaft 76, which is inclosed in a tube 76^a and is driven by gears 77, shaft 78 and a loose sprocket 79 having a clutch member 80 adapted to drive a clutch member 81 which is slidably keyed on the shaft and shifted by a lever 82, which has a spring 82^a holding the clutch members normally disengaged, but they may at any time be engaged when the lever 82 is operated by a rod 83, bell-crank lever 84 and foot lever 85. Of said foot levers there are two, one for each table, as shown at 85 in Fig. 5.

Each sprocket 79 is driven by a different link belt 86 or 86^a from smaller sprockets 87 fixed on a shaft 88, which shaft has a pulley 89 rotated by a belt 90 run by a suitable motor or other means (not shown).

In Fig. 6 91, 92 designates a screw conveyor that conveys the used sand from either one of the pits 23 and delivers it by a single spout 93 into the elevator 21.

In the operation of the apparatus the castings are placed on one of the tables 12, the hood lowered to cover the castings and the table, it fitting with its base flange 94 upon the top edge 95 of the lower hopper or pit 23, the table is then rotated while the sand is being blasted onto the castings it carries; meanwhile the next lot of castings is being arranged upon the exposed table, so that when the first lot is cleaned the hood may be raised and then lowered over the second table, and so on with both tables in alternate order. In doing this with the form of the machine shown in Fig. 1, the two tables exchange places to get under the hood one at a time. In the modified form Fig. 5 the hood is swung on a segmental line from one table to the other; and in Fig. 7 the hood is pushed along in a straight line from one table to the other on the wheels 67. The raising and lowering of the hood has already been described.

When the apparatus is designed for very heavy castings I make up each table of a lower member 12 (see Figs. 1 and 2) and an upper member 96, the latter mounted on wheels 97, for which the member 12 may preferably have grooves 98 in line with track rails 99 beyond the table 12. In this case the two table members are locked sufficiently together by a catch 100 which may be pivoted on either member and engage in a notch in the other member when the two members are in concentric position.

What I claim is:

1. In an apparatus of the kind described, the combination with a rotary table, of a cylindrical hood arranged to cover the table and its contents, and means for raising and lowering the hood.

2. In an apparatus of the kind described, two tables on which to support the castings

to be cleaned, means for rotating either one of the tables while the other table stands still, a hood having a vertical movement and adapted to cover alternately either one of the tables, and means for quickly establishing a vertical central relation between the hood and either one of the tables.

3. In a sand blast apparatus, a rotary table consisting of a lower perforated member to which rotary movement is imparted, and an upper perforated member adapted to be supported by the lower member, means for locking the members together so that the upper member will not move during rotation, said upper member having supporting rollers or wheels which rest on the lower member, means for supplying and directing a blast of sand onto articles carried by the upper member, and a track beyond the lower member for said wheels to roll on in removing and replacing the upper member.

4. In a sand blast apparatus for cleaning castings, a sand pit, a rotary table mounted in the upper part of the sand pit, a removable hood arranged to cover the table and with the pit form an enclosure, means for removing said hood from the pit, a suction pipe arranged to draw dust from said enclosure, and means for rotating said table.

5. In a sand blast apparatus, a base, a pit in the base, a plurality of tables rotatably mounted at the top of the pit, a hood cooperating with the pit to inclose one of said tables, means for directing a blast of sand

upon articles carried by the enclosed table, and means for rotating one table independently of the other table.

6. In an apparatus of the kind described, a plurality of tables and means for rotating them, and a hood having a vertical movement, and means for establishing central relation between the hood and any of the said tables.

7. In a sand blast machine, a rotatable table, a dust hopper member arranged beneath the table, a hood member designed to rest on the hopper and forming with the hopper a complete enclosure for said table, means for directing a blast of sand onto articles carried by said table, and means for moving one of said members relatively to the other member in order to permit articles on the table to be reached by the operator.

8. In a sand blast machine, a supporting member carrying a plurality of rotatable tables, a casing for normally enclosing one of said tables and including a dust receiving hopper and a hood member, means for moving one of said members relatively to the other member in order that said hood member may cover either of said tables, means for actuating said hood member to uncover one of said tables, means for rotating one of said tables, and means for directing a blast of sand onto articles carried by one of said tables.

In testimony whereof I affix my signature.

RICHARD RUEMELIN.