C. E. BILLINGS.

SAND BLAST APPARATUS.

APPLICATION FILED FEB. 4, 1915.

1,214,641.

Patented Feb. 6, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

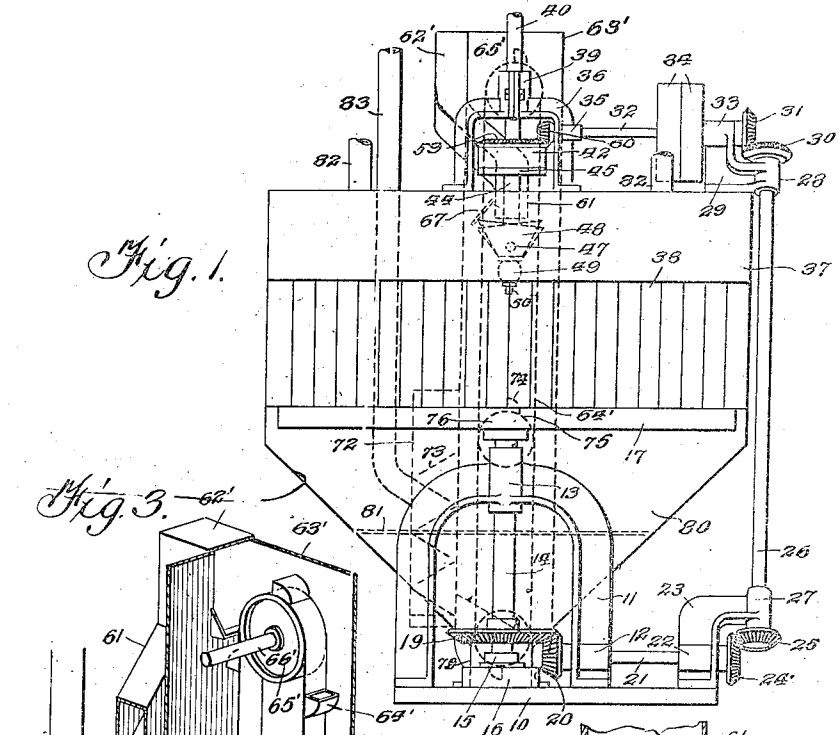


Fig. 3.

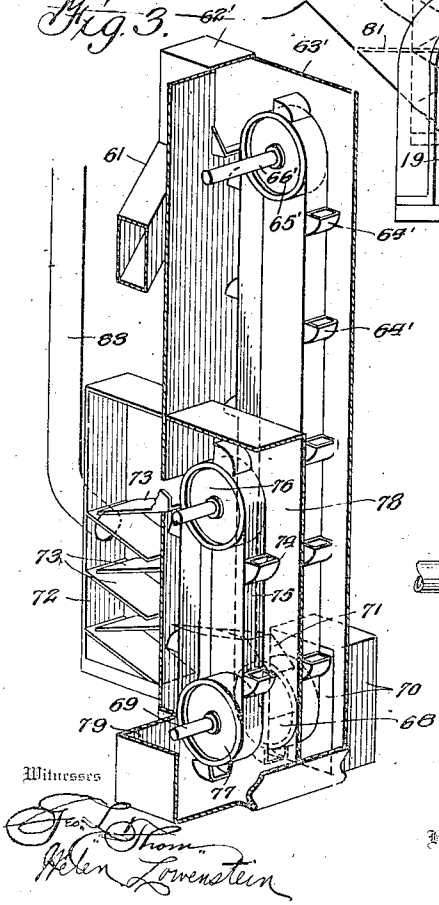


Fig. 4.

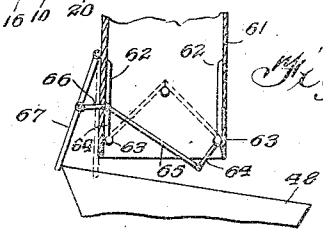
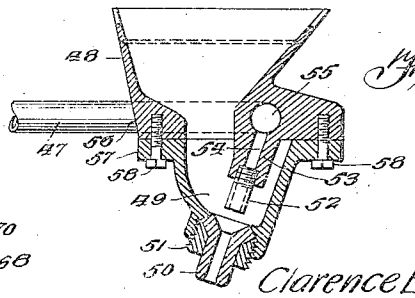


Fig. 5.



Witnesses

Geo. L. Thom.

Helen Lowenstein

Inventor

Clarence E. Billings

By Mason Fenwick & Lawrence

Attorneys

C. E. BILLINGS.

SAND BLAST APPARATUS.

APPLICATION FILED FEB. 4, 1915.

1,214,641.

Patented Feb. 6, 1917.

2 SHEETS—SHEET 2.

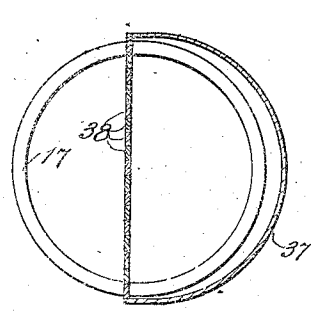


Fig. 9.

Fig. 2.

Fig. 7.

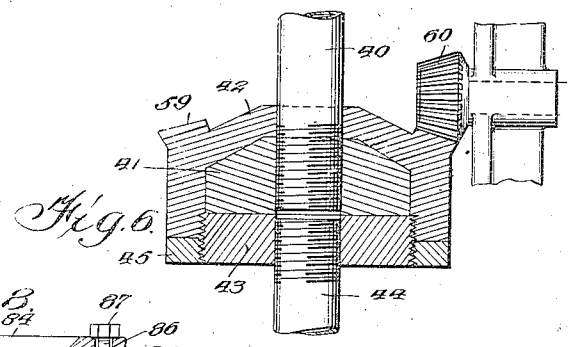


Fig. 6.

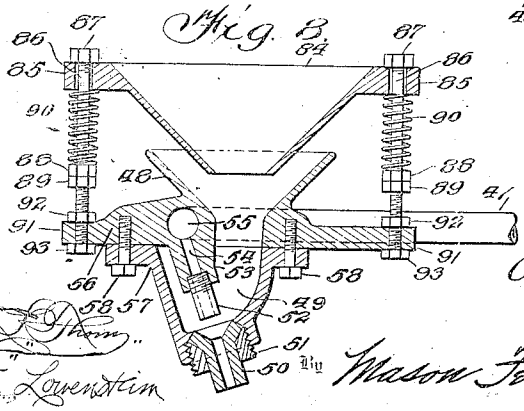


Fig. 8.

Witnesses

Helen Lowenstein

Inventor

Clarence E. Billings,

By Mason Fenwick & Lawrence

Attorneys

UNITED STATES PATENT OFFICE.

CLARENCE E. BILLINGS, OF NEW HAVEN, CONNECTICUT.

SAND-BLAST APPARATUS.

1,214,641. Specification of Letters Patent. Patented Feb. 6, 1917.

Application filed February 4, 1915. Serial No. 6,194.

To all whom it may concern:

Be it known that I, CLARENCE E. BILLINGS, citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Sand-Blast Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to sand blasts and more particularly to the self-contained type wherein the operative elements are confined in a protective housing.

It has for an object to provide an improved means for directing the sand blast upon the articles being treated.

A further object of this invention is provision of an improved form of spray head with the sand hopper carried thereby.

A further object of this invention is provision of a union in the air line between a stationary and moving part in which one part forms the bearing about which the other part rotates and the further provision of a driving means for the rotating part.

A further object of this invention is a provision of a sand-hopper in combination with a blast in which said hopper automatically controls the supply of sand thereto as it passes a delivering chute.

Further objects will be apparent from the following specification, appended claims and drawings thereof, in which,

Figure 1 is a front elevation of the device constructed in accordance with this invention, Fig. 2 is a side elevation thereof, Fig. 3 is a perspective view showing parts in section of the conveying mechanism and its associated parts, Fig. 4 is a sectional view through the delivering chute showing one form of valve mechanism, Fig. 5 is a vertical sectional view through the spray head and sand hopper, Fig. 6 is a sectional view through the joint supporting the revolving spray heads, Fig. 7 is a plan view of a small portion of the table which supports the articles being treated, Fig. 8 is a vertical sectional view through a modified form of spray head with an adjustable hopper carried thereby, and Fig. 9 is a horizontal sectional view as on the line 9—9 of Fig. 2.

In machines of this character, it is customary to confine the operative parts in a housing to prevent the escape of dust to the injury of an operator and this invention is along these lines but it simplifies the handling of the articles being treated by the sand blast in permitting all of the exposed faces of the said articles to be subjected to the sand blast which obviates the necessity of rehandling said articles as the turn-table which supports such articles during their treatment passes from the interior of the chamber.

Referring to the drawings forming part of this application, there is shown a base 10 upon which a standard 11 is mounted and this standard is provided with bearings 12 and 13. A vertical shaft 14 passes through the bearing 13 and has its lower end mounted in a bearing 15 upon a step 16. A turn-table 17 is mounted upon the upper end of the shaft 14 and the face of this turn-table is slotted to permit sand being blown against articles on the table to pass through said slots to a compartment in which said sand and dust are collected. The shaft 14 is further provided with a beveled gear 19 which meshes with a pinion 20 carried by the shaft 21 which passes through the bearing 12 and a bearing 22 in standard 23 which is also supported by the base 10. The shaft 21 supports a beveled gear 24 which meshes with a corresponding gear 25 carried by the shaft 26 which passes through the bearings 27 and 28 of which the bearing 27 is an integral part of the standard 23 and the bearing 28 is part of the standard 29. A gear 30 is mounted upon the upper end of the shaft 26 and this gear meshes with the corresponding gear 31 mounted upon one end of the shaft 32 which is journaled in the bearing 33 formed on the standard 29. Pulleys 34 are mounted upon the shaft 32 in the usual manner of which one of said pulleys may be loosely mounted upon said shaft and the other fixed thereto. The shaft 32 is also journaled in a bearing 35 in a standard 36 which together with the standard 29 is mounted upon a housing 37 which may be of semicircular design to partly surround the turn-table 17 and the front wall of said housing may be provided with an opening which is normally closed by a curtain 38 comprising a plurality of depending strips of flexible material to effectively close said opening against the escape of dust or other fine particles.

As the fixed pulley 34 is rotated, the table

17 is rotated through the gearing and shafting shown and any articles placed on said table for treatment are carried past the curtain 38 into the chamber formed by the housing 37 where they are subjected to the treatment of a sand blast, which in this application is directed against all of the exposed sides of the article as will be apparent from the following. The standard 36 has a fitting 39 formed thereon in two sections as shown which are adapted to clamp and support an air supply pipe 40 which passes vertically therethrough. This pipe supports a bearing block 41 on the lower end thereof, and said bearing block rotatably supports a shell 42 into the lower end of which a plug 43 is screwed. The plug 43 supports a depending tube 44 and a lock nut 45 which binds against the lower end of the shell 42. The tube 44 passes downwardly from the top of the housing 37 and is provided with a T 46 from which extend branch pipes 47 to support sand hoppers and spray heads at the ends thereof. As the hopper and spray head are formed in the same casting, they may be termed the spray head and as shown in Fig. 5, the hopper to receive sand is shown at 48. The lower end of said sand hopper terminates in the lower chamber 49 into which the nozzle 50 is inserted and held as by a nut 51, and through this nozzle sand is forced by an air spray from a jet 52. The jet 52 is carried by a nipple 53 having a passage 54 which communicates with the end of the branch 47 as at 55. The spray head may be formed of complemental halves as shown at 56 and 57 having bolts 58 as fastening means for said sections, this construction providing easy access to all parts in the interior thereof. It is apparent that air under pressure fed to the pipe 40 is distributed through the branches 47, passages 55 and 54 through the jet 52 where it collects particles of sand and forces the same through nozzle 50 to form a blast and through the rotation of the pipe 44, all parts of articles placed upon the table 17 are acted upon by the sand blast.

The shell 42 is provided with a gear 59 which meshes with a pinion 60 carried by the end of the shaft 32 and through rotation of the shaft 32 the table 17 as well as the sand blasts are rotated.

The sand is fed into the hopper 48 from a chute 61 which is provided at its lower end with a valve mechanism comprising dampers 62 which are mounted upon the shafts 63 having cranks 64 formed thereon to which ends of a link 65 are connected to cause said dampers to move in unison. One of said levers is connected as by a link 66 to a trip 67 which is adapted to engage the forward edge of the hopper 48.

The chute 61 is supplied from the housing 62′ formed on the housing 63′ which incloses a conveyer 64′ carried by the pulley 65′ on the shaft 66′ to which a pulley 67′ is also attached and the pulley 68 on the shaft 69. Sand is fed to the conveyer 64′ through a chamber 70, chute 71 from the separator housing 72 in which baffle plates 73 are mounted. Buckets 74 on a belt 75 passing over pulleys 76 and 77 in the chamber 78, raise sand for delivery over the baffle plates 73, from the chamber 79 which is at the bottom of the inclined bottom 80. A screen 81 is placed in the lower compartment of the housing 37. Dust may be removed from the several compartments as by suction through the exhaust pipes 82 and 83.

To facilitate in exposing all the sides of an article placed upon the turn-table 17 to the action of the sand blast, the axis of the revolving spray heads is eccentric to that of the turn-table as clearly shown in Fig. 2 of the drawing.

Fig. 8 shows a modification of the sand blast in which the branch pipe 47 and air nozzle remain the same as in the former description, but superposed above the hopper 48 is a supplemental hopper 84 having the desired capacity and having ears 85 extending therefrom which receive pins 86. These pins are provided at their upper ends with heads 87 which limit the upward movement of the ears 85 and said pins are further provided with adjusting nuts 88 and lock nuts 89 to regulate compression of the coil springs 90. The lower ends of the pins 86 pass through the extensions 91 and are held in fixed relation therein as by nuts 92 and 93. In this construction rotation of the sand blasts will cause the hoppers 84 to pass under the chute 61 in the usual order and when the hopper 84 is approximately emptied, the springs 90 raise said hopper to cause the edge thereof to engage the trip 67 but if a quantity of sand remains in the hopper, its weight causes the springs 90 to yield to cause the upper edge of the hopper to pass below the trip 67.

The operation of this device has been described in the foregoing description of the several parts and it is thought that further description is unnecessary.

Various modifications may be made within the scope of this invention without departing from the spirit thereof and the drawings are submitted for illustrative purpose only.

Having thus described my invention, I claim:—

1. A sand blast of the class described, comprising revolving spray heads, a sand chute disposed over the path of said spray heads in the rotation thereof, a delivery valve in said chute, and a valve operating trip actuated by said spray heads to discharge a quantity of sand from said chutes

to said sand blasts in the rotation of said spray heads.

2. A sand blast of the class described, comprising a revolving fitting having a continuous air supply thereto, sand blasts carried by said fitting, hoppers carried by said spray heads, a chute disposed over the path of said hoppers, a trip carried by said chute and actuated by said hoppers for delivering a quantity of sand into said hoppers, said hoppers having vertical movement with respect to said trip dependent upon the quantity of sand contained therein, and said hopper engaging said trip when in raised position to refill said hopper.

3. A sand blast of the class described, comprising a rotatable sand blast, said sand blast comprising a hopper to receive a quantity of sand therein, a chute for delivering said sand to said hopper as said hopper passes thereunder, and a valve mechanism carried by said chute actuated by said hopper when said hopper is positioned properly under said chute.

4. In a sand blast of the class described, a housing, a supply pipe for delivering a fluid pressure to the interior of said housing, a standard carried by said housing supporting said supply pipe, a head carried by the end of said supply pipe, a shell rotatably carried by said head, a plug carried by said shell to envelop said head with said shell and plug, an extension from said supply pipe rotatably carried by said shell and plug with respect to said head, a spray head carried by said rotatable extension and means for rotating said shell about said head.

In testimony whereof I affix my signature in presence of two witnesses.

CLARENCE E. BILLINGS.

Witnesses:
GEORGE L. THOM,
HUGO MOCK.