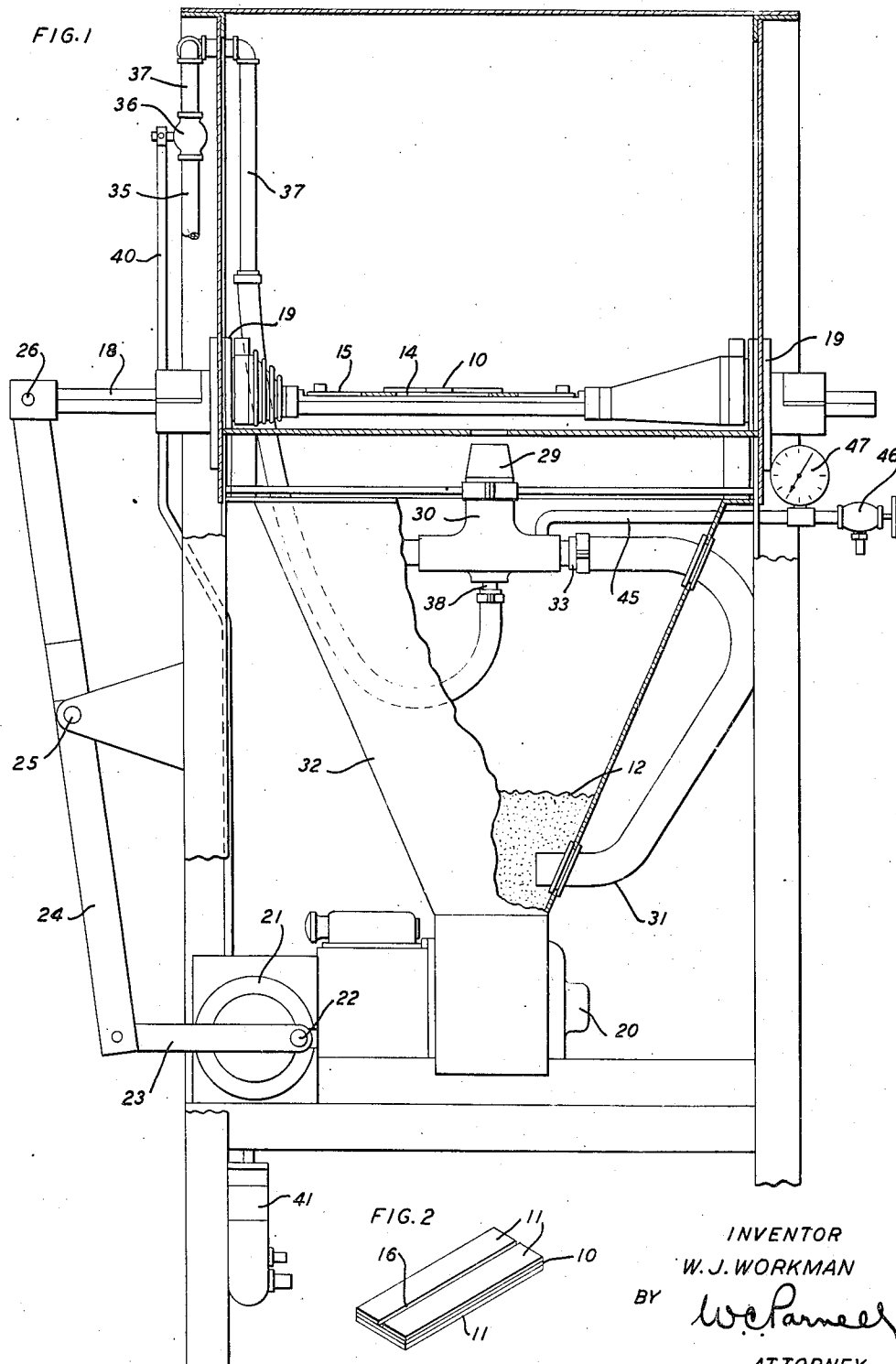


Oct. 4, 1949.

W. J. WORKMAN
SAND BLASTING MACHINE

2,483,956

Filed June 9, 1947



UNITED STATES PATENT OFFICE

2,483,956

SAND-BLASTING MACHINE

William J. Workman, North Arlington, N. J., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York.

Application June 9, 1947, Serial No. 753,408

1 Claim. (Cl. 51—8)

1

This invention relates to sand blasting machines, and more particularly to an abrasive control therefor.

Conventional types of sand blasting machines are employed to condition external surfaces of articles and in such instances, it is not essential that variable quantities of abrasive material be directed toward the articles. In the present invention the abrasive material is directed through a narrow slot or aperture to remove silver coating material from a quartz crystal along a given line, defined by a narrow aperture in a mask, to divide the silver coating in two parts. It has been found that the narrow aperture in the mask may become clogged with the abrasive material creating undesirable effect on the coated crystals; if the abrasive material is forced in greater quantities than may be received readily in the narrow aperture.

It is the object of the present invention to provide a simple and efficient control for a sand blast unit, in a sand blasting machine, wherein abrasive material of variable amounts may be forced through the unit.

With this and other objects in view, the invention comprises a unit in a sand blasting machine including a nozzle to direct an abrasive material in a given path. A hopper for a supply of the abrasive material has a conduit leading therefrom to the unit. A valve is actuable to admit air under pressure to the unit, and through the unit and nozzle thereof, to create a vacuum in the unit drawing the abrasive material from the hopper. The salient feature of the invention is a provision of means to admit air to the unit short of the nozzle to reduce the said vacuum to reduce the amount of the abrasive material drawn into the unit. More specifically, this means includes an air line entering the unit adjacent the portion where the vacuum is created and including a valve to admit variable quantities of air at atmospheric pressure into the unit to vary the vacuum therein to vary the amount of abrasive material drawn into the unit. There is also positioned in this air line a gage to indicate the vacuum in the unit.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawings, wherein

Fig. 1 is a front elevational view of a sand blasting machine embodying the invention, portions thereof being shown in section; and

Fig. 2 is a perspective view of an article which is to be sand blasted by the machine.

2

The sand blasting machine in general is not shown in detail as it is substantially identical with the sand blasting machine shown in the copending application of C. J. Kammerer and A. N. MacKinnon, Serial No. 753,448, filed June 9, 1947, with the power means disclosed in the copending application of H. H. Merwin, Serial No. 753,535, filed June 9, 1947, now Patent No. 2,463,895, dated March 8, 1949.

The article shown in Fig. 2 includes a quartz crystal wafer 10 with coatings 11 of silver. The coatings 11 are to be divided in two parts by the abrasive material 12 forced through a narrow aperture 14 in a mask or carriage 15. The upper coating 14 as shown in Fig. 2 has been divided in two parts by a groove 16.

The carriage 15 is supported on parallel rods 18, only one of which is shown in the drawing, these rods being supported in bearings 19 which are carried by the main frame of the machine. A power unit 20 drives a fly wheel 21 which carries a stub shaft 22 connected to one end of a link 23, the other end of the link being pivotally connected to a lever 24. The lever 24 is pivotally supported at 25 intermediate its ends while its upper end is pivotally connected at 26 to the rods 18. In this manner, the carriage 15 is moved through an operating cycle from its starting or loading position shown in Fig. 1 to a given position to move the article through the path of abrasive material and back to the starting position.

The path of the abrasive material extends vertically from a nozzle 29 of a unit 30. The unit 30 may be similar to the conventional sand blasting units in that a vacuum is created therein by air under pressure travelling therethrough to draw the abrasive material into the unit and force it through the nozzle in the given path. A conduit 31, leading from a hopper 32 which houses the supply of abrasive material 12, has its upper end connected at 33 to the unit 30. A supply line 35 for air under pressure is connected through a valve 36 to an air line 37, which extends to the unit 30 and is connected thereto at 38 in alignment with the nozzle 29. A pull rod 40 is under the control of a treadle 41 which also operates a one revolution clutch (not shown) to connect the power means 20 to the fly wheel 21.

The salient feature of the invention includes an air line 45 connected to the unit 30 and communicating with the inner portion of the unit where the vacuum is created. The air line 45 is provided with a valve 46 which may be opened variable amounts to admit air under pressure through the line 45 and into the unit 30. A gage

3

47 disposed in the line 45 short of the valve 46 indicates the degree of vacuum in the unit 30.

During operation of the sand blasting machine, an article 10 is placed on the carriage 15 over the narrow aperture 14 after which a treadle 41 is actuated to cause reciprocation of the carriage and to open the valve 36 holding it open during movement of the carriage. The air under pressure entering the unit 30 from the air line 37 will pass through the unit and the nozzle creating a vacuum in the unit to draw abrasive material 12 from the hopper 32 through the conduit 31 and into the unit 30 where the material will be forced through the nozzle as it enters the path of the air under pressure. The amount of abrasive material may be varied by reducing the vacuum in the unit. This is accomplished by adjusting the valve 46 from a closed position to a partially opened position, admitting air at atmospheric pressure in variable amounts to reduce the amount of abrasive material forced through the unit to the article. In this manner, the most efficient results may be accomplished completely severing the coating 11 on the quartz crystal in two parts without damaging the crystal.

Although specific improvements of the invention have been shown and described, it will be understood that they are but illustrative and that various modifications may be made therein without departing from the scope and spirit of this invention as defined by the appended claim.

What is claimed is:

In a sand blasting machine a unit including a nozzle, to direct an abrasive material such as sand in a given path, a vacuum chamber, an air inlet to the vacuum chamber, an abrasive inlet to the vacuum chamber spaced from the air inlet and an auxiliary air inlet to the vacuum chamber between the air inlet and the abrasive

4

inlet, a hopper for a supply of the abrasive material, a conduit for the abrasive material connecting the hopper to the abrasive inlet of the unit, a supply line for air under pressure, an air line connecting the supply line to the air inlet of the unit, a normally closed valve interposed between the supply line and the air line actuable to open communication between the lines whereby the air under pressure travelling through the unit and out of the nozzle will create a vacuum in the vacuum chamber to draw the abrasive material through the conduit from the hopper where it will be forced through the nozzle by the air under pressure, the quantity of abrasive material being withdrawn from the hopper depending upon the vacuum in the vacuum chamber, an auxiliary air line connected to the auxiliary air inlet, and a valve in the auxiliary air line actuable to admit varied quantities of air at atmospheric pressure into the vacuum chamber between the air and abrasive inlets to vary the vacuum in the chamber to vary the amount of abrasive material drawn into the unit.

WILLIAM J. WORKMAN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,073,149	Lawrence	Sept. 16, 1913
2,388,818	Bick	Nov. 13, 1945
2,421,806	Perry	June 10, 1947

FOREIGN PATENTS

Number	Country	Date
166,761	Great Britain	July 28, 1921