

- [54] ABRASIVE BLASTING EQUIPMENT AND  
SELF-CLEANING ABRASIVE TRAP  
THEREFORE

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- [22] Filed: **Apr. 12, 1971**

- [21] Appl. No.: 133,014

- [52] U.S. Cl. .... 51/12

- [51] Int. Cl. .... B24c 7/00

- [58] **Field of Search**..... 51/8, 12

- [56]

### References Cited

## UNITED STATES PATENTS

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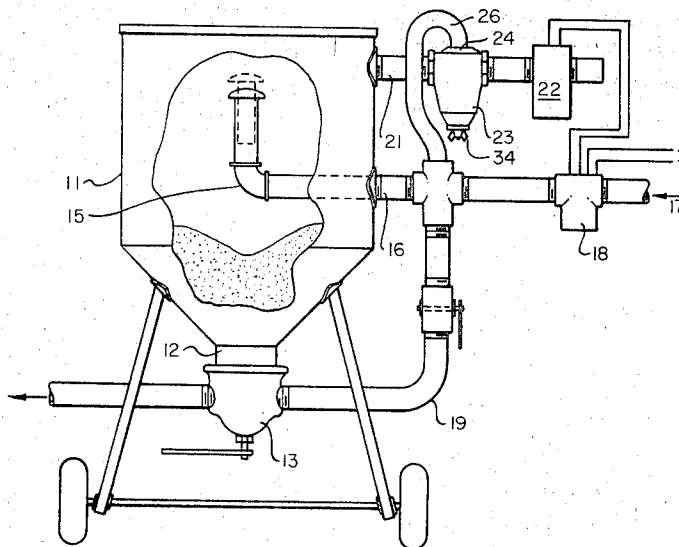
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- [57]

## ABSTRACT

Abrasive blasting equipment of the type where the tank is depressurized to stop blasting having a self-cleaning abrasive trap interposed between the tank and the exhaust valve to protect the valve from wear by abrasive entrained in the exhaust stream.

### 5 Claims, 3 Drawing Figures



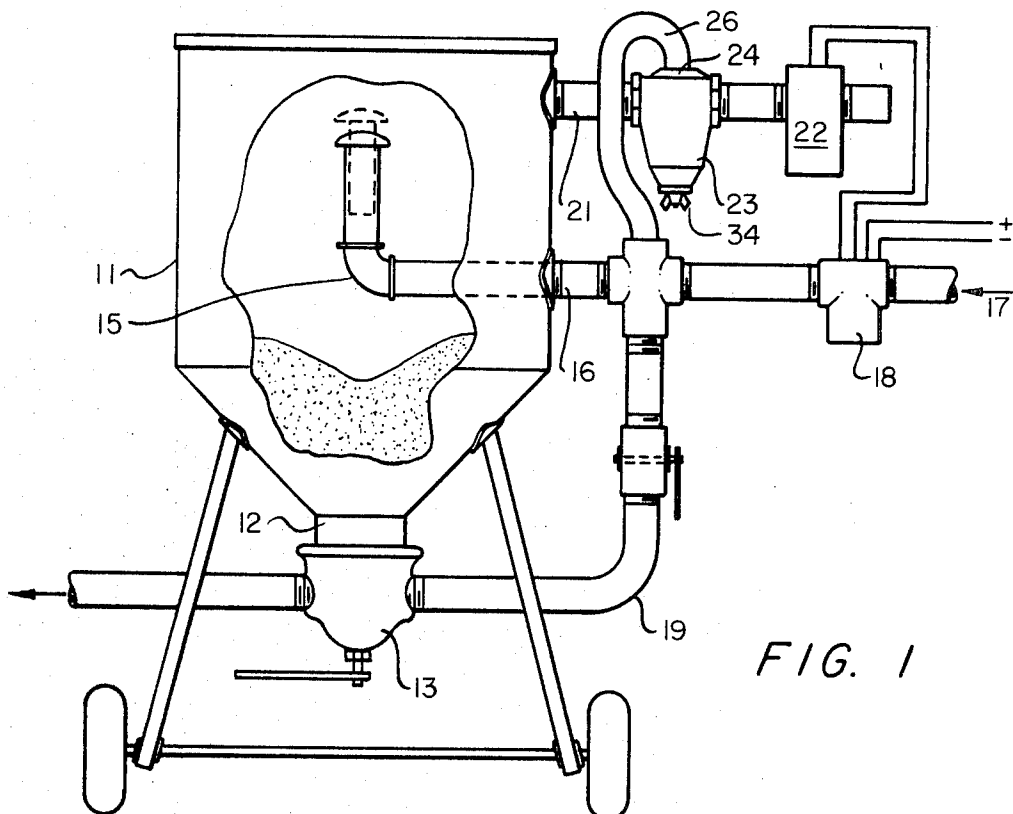


FIG. 1

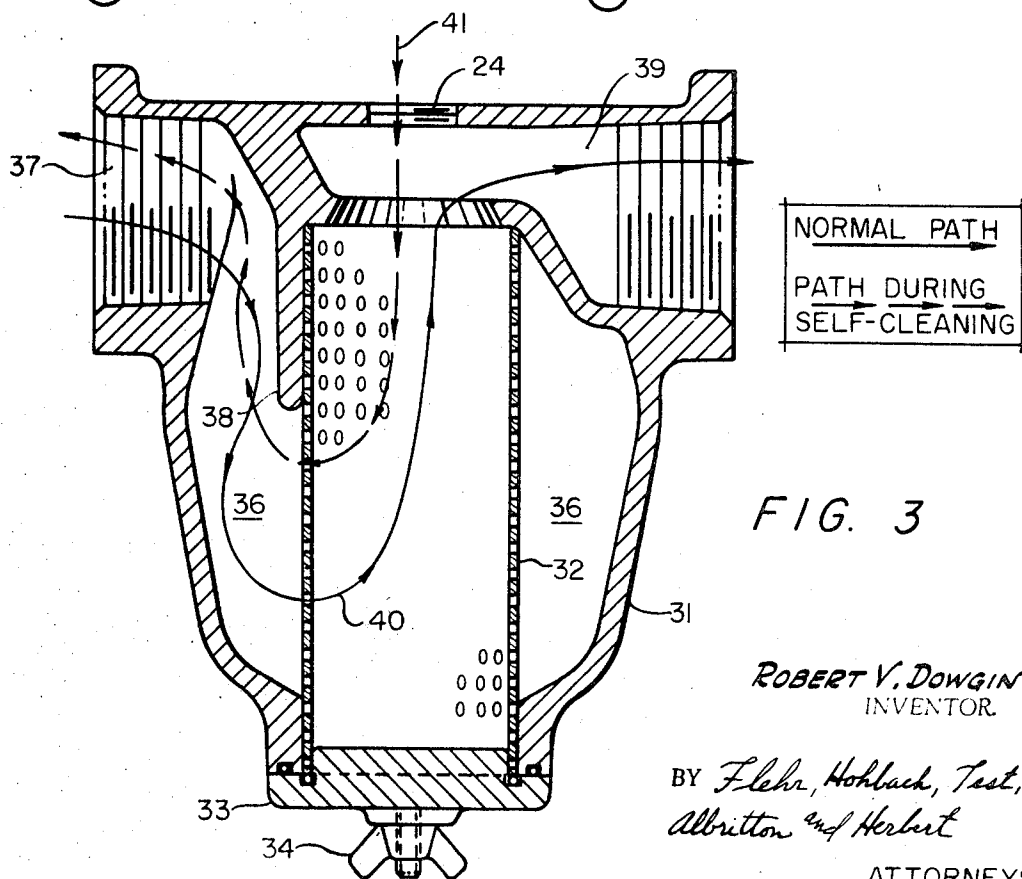


FIG. 3

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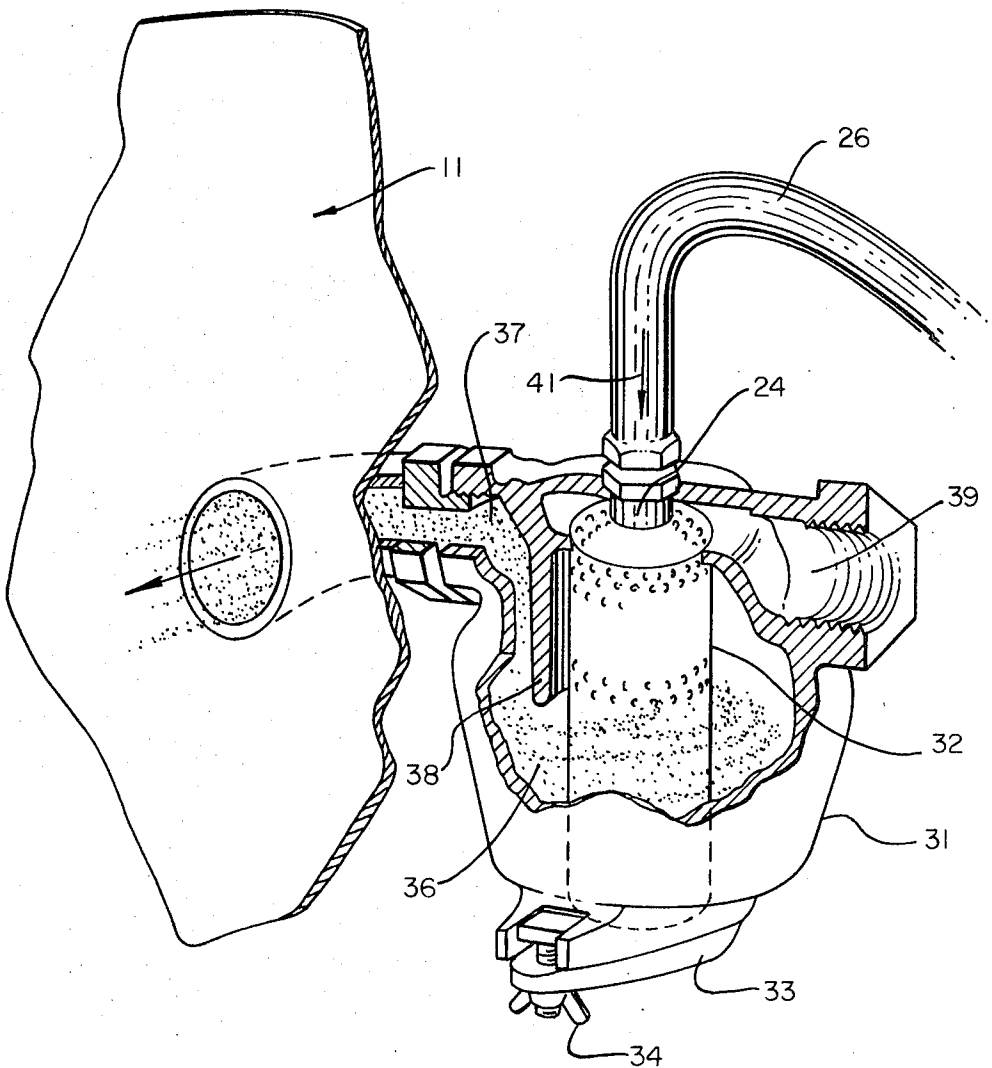


FIG. 2

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## ABRASIVE BLASTING EQUIPMENT AND SELF-CLEANING ABRASIVE TRAP THEREFORE

### BACKGROUND OF THE INVENTION

This invention relates generally to abrasive blasting equipment and more particularly to abrasive blasting equipment employing a self-cleaning abrasive trap and to a self-cleaning abrasive trap.

In abrasive blasting equipment where the tank is depressurized to stop blasting, an abrasive trap is normally installed in front of the exhaust valve to protect the valve from rapid wear due to abrasives entrained in the exhaust stream. In average duty, this trap requires maintenance once or twice daily and is generally the only item of the equipment which requires daily care.

### OBJECTS AND SUMMARY OF THE INVENTION

It is a general object of the present invention to provide improved abrasive blasting equipment and a self-cleaning abrasive trap therefore.

The foregoing and other objects of the invention are met by an abrasive blasting equipment including a tank having a pressurizing inlet, an input valve serving to selectively apply pressure to the blasting equipment and tank inlet from associated equipment, an exhaust outlet, an exhaust valve connected to said exhaust outlet adapted to depressurize the tank, an abrasive trap interposed between the tank and the exhaust valve and means connected between the outlet side of the input valve and the abrasive trap so that when the inlet valve is opened a burst of air is directed backward through the abrasive trap, loosening abrasive collected in the trap and carrying the abrasive back into the tank.

### BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is an elevational view of abrasive blasting equipment in accordance with the invention.

FIG. 2 is a perspective view of a self-cleaning trap in accordance with the invention incorporated in the equipment of FIG. 1.

FIG. 3 is a sectional elevational view of the abrasive trap shown in FIGS. 1 and 2.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, the equipment comprises a conventional tank 11 which is charged with abrasive prior to blasting. The tank is provided with a material outlet 12 which may include a material metering valve 13. The tank is provided with an inlet 16 which is connected to high pressure air applied at 17 through inlet valve 18 to pressurize the tank in a conventional manner. The inlet 16 cooperates with a conventional pop-up valve connected to standpipe 15 in the tank 11. The high pressure air also travels along the pusher line 19 to entrain abrasive at the outlet 12.

The tank includes an exhaust outlet 21 which communicates with exhaust valve 22. The inlet valve 18 and exhaust valve 22 may be remotely operated. With the inlet valve 18 closed, the exhaust valve 22 may be opened to depressurize the tank to stop blasting. An abrasive trap 23 is interposed between the outlet 21 and the exhaust valve 22 to protect the exhaust valve from entrained abrasive in the exhaust air. In accordance with the present invention, a self-cleaning abrasive trap, to be described below, is employed. It includes an inlet port 24 which is connected on the down-

stream side of the valve 18 by a conduit 26. Every time the valve 18 is opened to pressurize the tank, air is directed through the conduit 26 through the abrasive trap, loosening abrasive in the trap and carrying the abrasive back into the tank. Air also flows through 16 to pop-up standpipe 15 to pressurize the tank. As soon as the pressure in the tank is brought up to normal, there is little or no reverse flow through the trap.

FIG. 2 is a perspective view of a trap in accordance with the invention. The trap includes a casting 31 providing a housing which accommodates a screening device such as screen 32. The screen is replaced by removing the plate 33 secured to the casting by thumb screws 34. The outlet from the tank is connected to the housing and communicates with the chamber 36 surrounding the screen via passage 37. A baffle member 38 serves to deflect entrained abrasive whereby it does not impinge directly upon the screen during the exhaust cycle. The exhaust air then travels inwardly through the screen, upwardly through the center of the screen through passage 39 to the exhaust valve 22, as shown by arrow 40. Conduit 26 is connected to the port 24 of the trap 23. During the pressurizing cycle, air flows through conduit 26 downwardly into the center of the screen, outwardly through the screen, loosening all the collected abrasive and entraining the abrasive whereby it is carried back through the outlet opening 37 into the tank as shown by arrow 41.

FIG. 3 is a sectional view of the abrasive trap showing in detail the baffle 38 and the passages 37 and 39, the screen 32 and plate 33. The same reference numerals as used in FIG. 2 are applied in FIG. 3 for like parts.

In operation of the abrasive blasting equipment, the tank is pressurized by opening the valve 18 and closing valve 22. Simultaneously, upon opening of the valve 18, pressure is applied to the interior of the tank through the inlet 16 and through the exhaust outlet 21 via the trap 23 which receives air along the conduit 26 which then flows through and cleans the trap. When blasting is completed, the valve 18 is closed and valve 22 is opened to depressurize the tank. Any entrained abrasive in the exhaust air impinges upon and is screened by the screen 32. It has been found that not only does the self-cleaning trap eliminate or reduce maintenance down-time, but it also prevents abrasive build-up in the pop-up stems, moisture separators, pusher lines and other associated equipment.

It is, of course, understood that the abrasive trap can be of other construction. The important feature of this invention is the ability to clean the abrasive trap by the simple expedient of providing a reverse flow of air through the abrasive collector to clean it without the necessity of disassembly.

We claim:

1. Abrasive blasting equipment having an abrasive outlet for directing abrasive entrained in an air stream upon a surface including a tank having a pressure inlet, an inlet valve serving to admit air under pressure to the tank through said pressure inlet, and to said abrasive outlet, an exhaust outlet from said tank, an exhaust valve connected to said exhaust outlet to depressurize the tank, an abrasive trap interposed between the exhaust outlet and the exhaust valve, a pop-up valve to block reverse flow through said pressure inlet when said exhaust valve is opened, and means for directing inlet air to said trap and said pressure inlet upon opening said inlet valve so that the air travels backward

through said trap and said exhaust outlet to clean the trap, said inlet and exhaust valves being controlled to operate in mutually opposite open and closed conditions.

2. Abrasive blasting equipment as in claim 1 wherein said abrasive trap includes a screen adapted to collect abrasive entrained in the exhaust air flow when said tank is exhausting.

3. Abrasive blasting equipment as in claim 1 wherein said means for directing inlet air to said trap comprises a conduit connected between the downstream side of said inlet valve and the abrasive trap to admit inlet air under pressure to said trap whereby air travels backward through said trap from the time the inlet valve is opened until the pressures in the trap and the tank are equalized.

4. Abrasive blasting equipment as in claim 2 wherein said screen is cylindrical and exhaust air flows inwardly from the outside and inlet air flows outwardly from the inside.

5. Abrasive blasting equipment for use with a high pressure air source including a tank, a pressurizing path attached to said tank, an inlet valve in said pressurizing path for communication with said high pressure air source, an exhaust path attached to said tank, an exhaust valve in said exhaust path for communication with ambient pressure, an abrasive trap between said tank and said exhaust valve, a conduit attached to the downstream side of said inlet valve in communication with said abrasive trap, a pop-up valve for preventing reverse flow in said pressurizing path, and means for causing said inlet and exhaust valves to operate in mutually opposite open and closed conditions whereby when said exhaust valve is opened abrasive entrained in air flow through said exhaust path is collected in said trap and when said inlet valve is opened abrasive collected in said trap is entrained in air flow through said exhaust path and returned to said tank until said tank and trap pressures equalize.

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