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Haker

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[54] **SAND BLAST ROOM**

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[52] **U.S. Cl.** ..... **51/8 R,** 51/270, 98/43, 214/307

[51] **Int. Cl.** **B24c 9/00**

[58] **Field of Search** ..... 51/268, 270, 8 R, 9, 14, 51/15; 98/43, 110; 214/17 R, 17 D, 17 DA, 35 A, 302, 307

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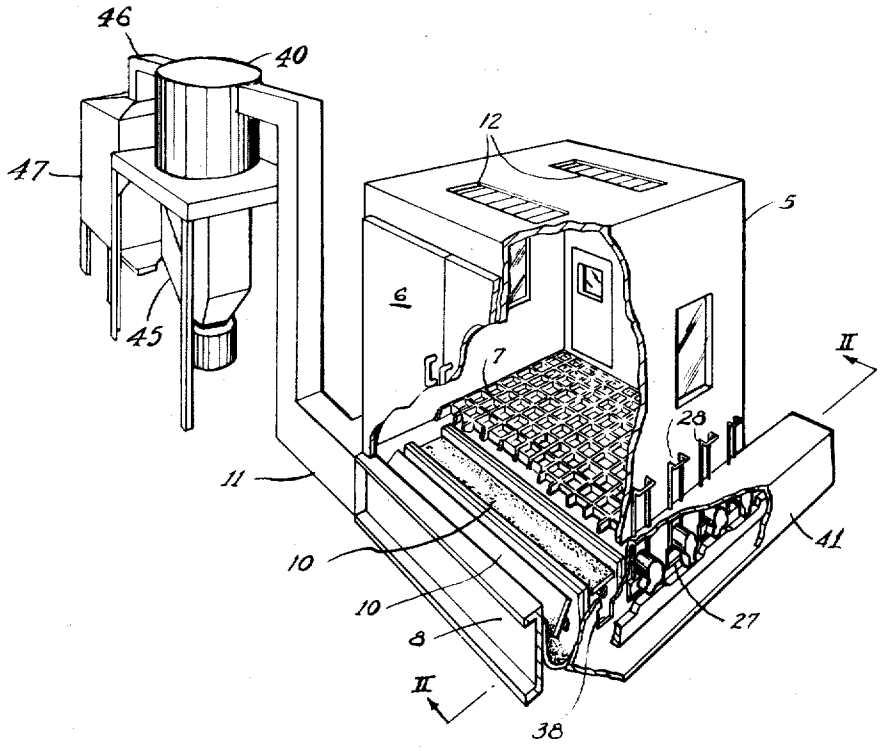
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Attorney, Agent, or Firm—Christel & Bean

[57] **ABSTRACT**

A sand blast room has a grid-like floor through which abrasive material resulting from sand blasting operations may fall. A series of parallel adjacent channels extends beneath the grid-like floor to receive the abrasive material. A suction duct is connected to one end of each channel and a closure plate is disposed at the upper portion of each channel and movable between open and closed positions. When a given closure plate is closed the suction is horizontal through the associated channel and clears the same of abrasive material. When a closure plate is open the suction draws air downwardly through the blast room and the grid floor and into the channel to clear the air in the blast room. The arrangement is such that every other channel has its closure plate open while the intervening channel cover plates are closed and the relative positions are continuously reversed during operation of the apparatus.

6 Claims, 5 Drawing Figures



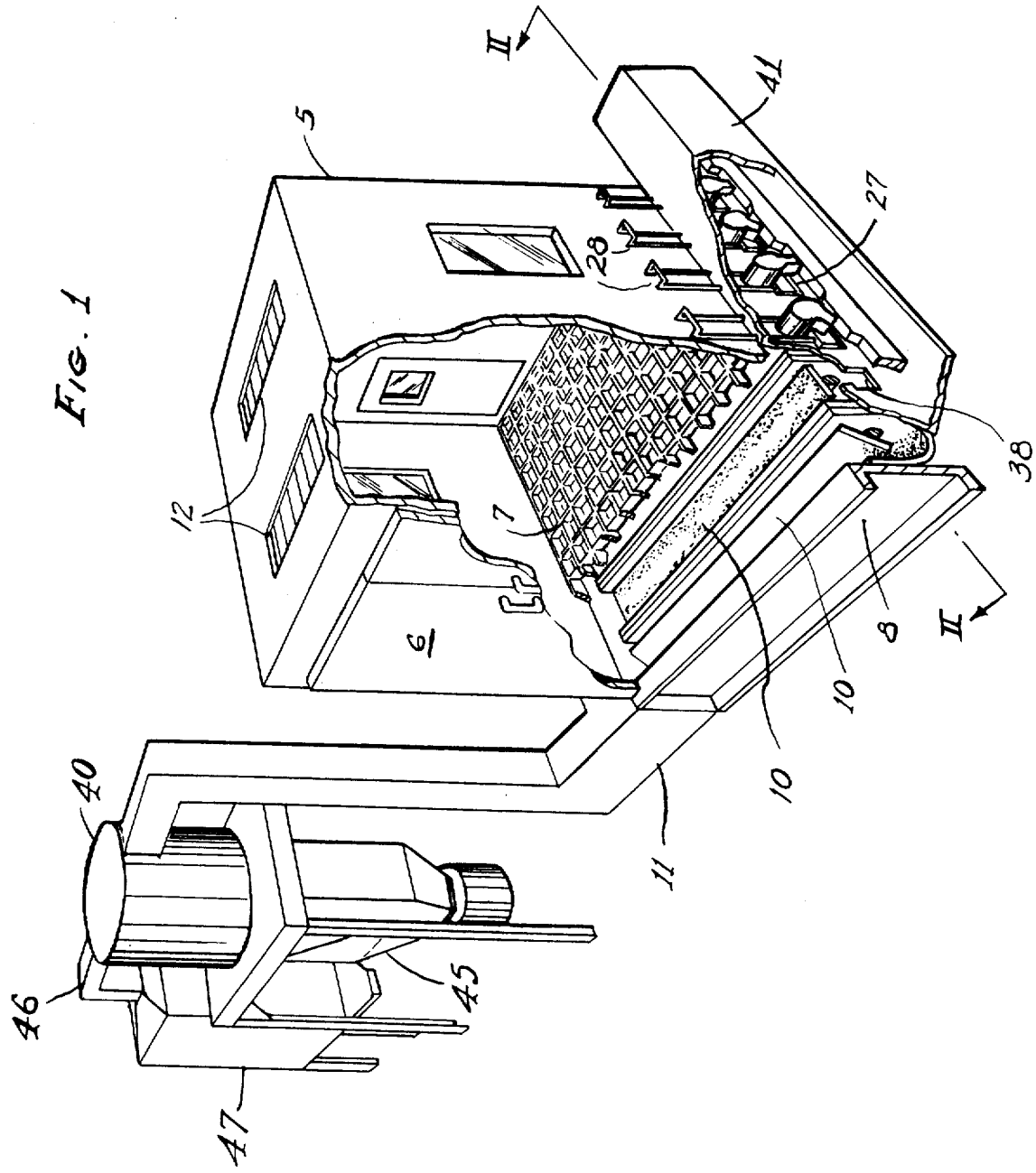


FIG. 1

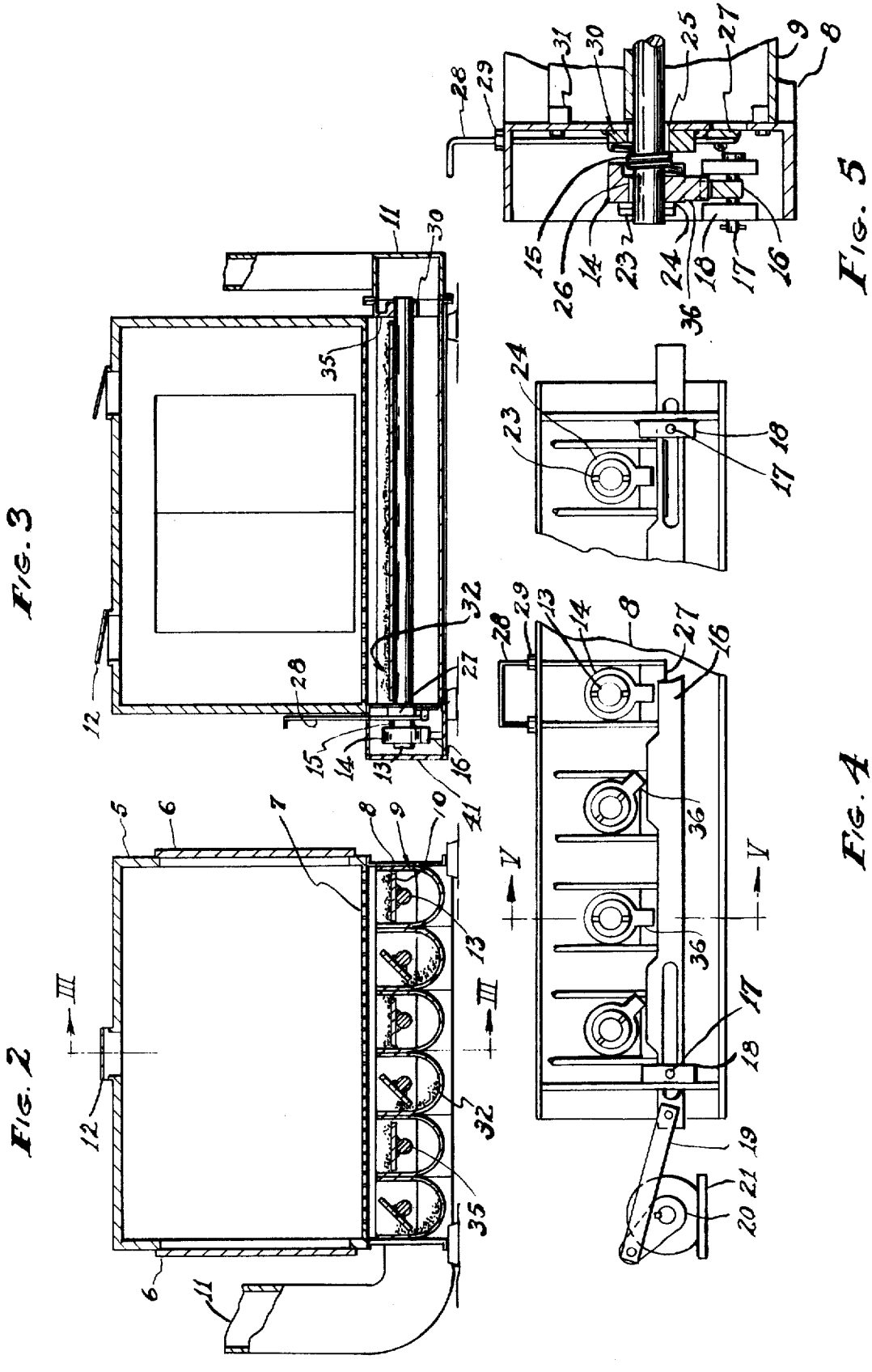


FIG. 2

FIG. 3

FIG. 4

FIG. 5

SAND BLAST ROOM

BACKGROUND OF THE INVENTION

This invention relates to a blast room, that is, a room in which sand blasting operations are performed. The invention relates more particularly to an arrangement and apparatus whereby such a blast room is efficiently and effectively maintained in a relatively dust-free condition and whereby the substantial quantities of abrasives which are discharged during sandblasting are collected and removed from the blast room area.

In some of the blast room arrangements of the prior art the removal of dust from the air in the room is accomplished by drawing air horizontally through the room to collect dust and the like from the atmosphere in the room. In such installations the means for maintaining the air in the room in a relatively clean condition is entirely separate from the problem of collecting the abrasive material which falls to the floor of the room during sandblasting operations.

Attempts have been made to draw air downwardly through the room and through a grid-like floor to clear the air in the room and at the same time remove the abrasive material which falls through the grid-like floor of the room. The quantities of air required in this type of operation reduce the air velocity to a point where the abrasive material cannot be effectively collected from beneath the grid-like floor. Furthermore, the downward direction of air through the floor militates against collecting the abrasive material in a horizontal direction to remove the same from beneath the floor.

SUMMARY OF THE INVENTION

The method and apparatus provided by the present invention renders it feasible and efficient to employ down draft air flow for clearing the air in the blast room in conjunction with horizontal air flow beneath the floor of the room to remove the abrasive material which falls through the perforated or grid-like floor of the room during sandblasting operations. Speaking generally, this is accomplished by providing a sub floor beneath the grid-like floor and dividing this sub floor into alternate areas, each area being closable by valve means. The arrangement is such that a portion of the valve means, for instance every other valve, is closed while the remaining valves are open, and vice versa. In this way the down draft air flows first through one set of valve means which are then open and then through the other set of valve means which opens in alternation with the first set. When a given set of valve means are closed the suction which is applied to the space beneath the sub floor is effective to create a substantial generally horizontal air flow to clear the space beneath such closed valve means of abrasive material which falls through the grid-like floor.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a general perspective view of one form of the apparatus of the present invention;

FIG. 2 is a vertical cross-sectional view taken generally on the line II—II of FIG. 1;

FIG. 3 is a cross-sectional view taken on the line III—III of FIG. 2;

FIG. 4 is a fragmentary end elevational view of a cam mechanism viewed in the same direction as FIG. 2; and

FIG. 5 is a fragmentary cross-sectional view taken on the line V—V of FIG. 4.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

In the drawings the numeral 5 designates a ceiling and wall structure forming a blast room and having access doors 6 and a floor 7 which comprises a grid or grating through which sand or other abrasive material may fall during sandblasting operations.

The blast room generally and the floor 7 particularly are supported in an elevated position by a pair of horizontal channel members 8. The collection means for the abrasive material falling through floor 7 comprises a series of troughs 9 disposed beneath floor 7 as best shown in FIG. 2. The troughs 9 comprise a series of abutting, parallel U-shaped channels as best shown in FIG. 2.

The right hand ends of channels 9 as viewed in FIG. 3, the outlet ends, are closed at their upper portions by plates 35, leaving the lower end portions open for air flow from the channels into a duct 11 which leads to separating apparatus as will presently appear. Each channel 9 is provided with a closure plate 10 which extends lengthwise of the channel and is fixed to a shaft 13 which bears at its opposite ends in bearings 30 supported by the end wall portions of the channels.

By reference to FIG. 2 it will be noted that alternate plates 10 are in a laterally inclined position while the intervening plates are horizontal. Movement of the plates 10 between these alternate positions is effected by rotation of the supporting shafts 13 and in the present embodiment such rotation is effected as follows. Each shaft 13 has a collar 14 keyed thereto as at 26 and a torsion spring 15 acts between the collar and the adjacent fixed bearing 30 to urge each collar to the position shown for the second, fourth and sixth collars in FIG. 4. Each collar 14 has an arm portion 36 for engagement by a cam bar 16 which is guided for horizontal movement at right angles to the axes of the several shafts 13. To this end cam bar 16 is slotted to receive fixed guide rods 17 which are supported by blocks 18. The several arm portions 36 are normally retained in downwardly extending positions by the action of the spring 15 and are rocked to plate tilting positions by reciprocation of cam bar 16.

In FIG. 1 the numeral 40 designates a conventional cyclone reclaimer which includes a high velocity air displacement means whose inlet end is connected to duct 11, thus producing air flow through the several channels 9 in a direction from left to right as viewed in FIG. 3. The inlet end of each channel 9 is provided with an air inlet opening 38, each such opening 38 having a damper plate 27 which is manually vertically adjustable by means of a handle 28. A manifold 41 encloses the several damper openings 38 and is open at its right-hand end as viewed in FIG. 1.

It is desired that the suction from the cyclone reclaimer 40 serve the dual purpose of drawing air through the several damper openings 38 to clear the same of abrasive material and also draw air downwardly through the blast room 5 to remove dust from the interior of the blast room. For this purpose air openings 12 are provided in the ceiling of the blast room.

However, if all of the channels are continuously open beneath floor 7 the suction is too greatly dissipated in

drawing air downwardly through the grid which forms floor 7 to have a sufficiently effective longitudinal movement through the channels to clear the latter of abrasive material. Accordingly, the present apparatus is so arranged that communication between the interior of the blast room and the several channels 9 is intermittent. When a given plate 10 of a channel 9 is in horizontal position, thus closing the upper portion of channel 9, horizontal air flow through such channel beneath plate 10 is at substantial velocity and adequate to clear the same of abrasive material.

When a given closure plate is inclined so that abrasive material falls from the closure plate to the interior of the channel 9 and there is free air communication downwardly through floor 7 and into channel 9, there is not sufficient horizontal air flow through the damper opening 38 to carry adequate amounts of abrasive material from the channel but during such period air is drawn downwardly through the interior of the blast room and into such channels 9 as have their plates 10 pivoted to open position.

In the present instance the closure plates are shown as operating alternately. In FIG. 1 the first, third and fifth closure plates 10 are in inclined open position while the second, fourth and sixth plates 10 are in horizontally closed position. Thus at this particular phase of operation air will flow entirely horizontally through the second, fourth and sixth channels to clear the same of abrasive material while air flowing into the first, third and fifth channels through the grid floor 7 serves to rid the air at the interior of the blast room from dust. With each cycle of reciprocation of cam bar 16 the relative open and closed positions of the plates 10 are reversed. As shown in FIG. 4, a motor 21 has a crank 20 fixed to its drive shaft and a link 19 connects the crank with cam bar 16 to continuously reciprocate the same.

Any sequence of opening and closing movements of plates 10 may be employed and in fact all of the plates 10 may be arranged to alternately open and close at the same time so that during one phase of operation suction from the cyclone reclaimer 40 is effective to clear all of the channels 9 while at a subsequent phase of operation substantially all of the air drawn through duct 11 by cyclone reclaimer 40 will pass downwardly through the blast room for dust collection purposes.

The cyclone reclaimer 40 and the associated apparatus shown at the left-hand side of FIG. 1 is conventional in blast room operation. Abrasive material collected by the reclaimer falls to a hopper 45 from which it is removed for re-use. The air and suspended dust particles pass from the cyclone reclaimer by way of a duct 46 to a conventional dust collector 47 and the clean air therefrom may be discharged to the atmosphere or, as in some blast room installations, may be conducted back to the entry duct 41.

A preferred embodiment of the present invention has been described herein and shown in the accompanying drawings to illustrate the underlying principles of the invention but it is to be understood that numerous modifications may be made without departing from the broad spirit and scope of the invention.

I claim:

1. Apparatus for performing sand blasting operations comprising a sand blast room having a grid-like floor through which abrasive materials may fall during sand blasting, a plurality of parallel channels beneath said floor for receiving said materials, means for covering the upper sides of said channels and movable between channel closing and channel opening positions, said channels having air inlet openings at one end of each and duct means communicating with the opposite ends of said channels, suction means connected to said duct means for causing air flow through said channels to said suction means, and means for alternately opening and closing said channel covering means to produce maximum horizontal air flow through said channels when said means are closed and for producing purifying air flow downwardly from said room and through said floor when said means are open.

2. Apparatus according to claim 1 including means for continuously alternately opening and closing said covering means.

3. Apparatus according to claim 2 wherein the opening and closing means are arranged so that alternate covering means are closed when the intervening covering means are closed.

4. Apparatus for performing sand blasting operations comprising a sand blast room having a grid-like floor through which abrasive materials may fall during said blasting, a plurality of parallel channels beneath said floor for receiving said materials, cover plates at the upper portions of said channels movable between horizontal channel closing positions and inclined channel opening positions, said channels having air inlet openings at one end of each and duct means communicating with the opposite ends of said channels, suction means connected to said duct means for causing air flow through said channels to said suction means, and means for alternately opening and closing said cover plates to produce maximum horizontal air flow through said channels when said cover plates are closed and for producing purifying air flow downwardly from said room and through said floor when said cover plates are open.

5. Apparatus according to claim 4 including means for continuously alternately opening and closing said cover plates.

6. Apparatus according to claim 5 wherein the cover plate opening and closing means are arranged so that alternate cover plates are closed when the intervening cover plates are closed and vice versa.

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