

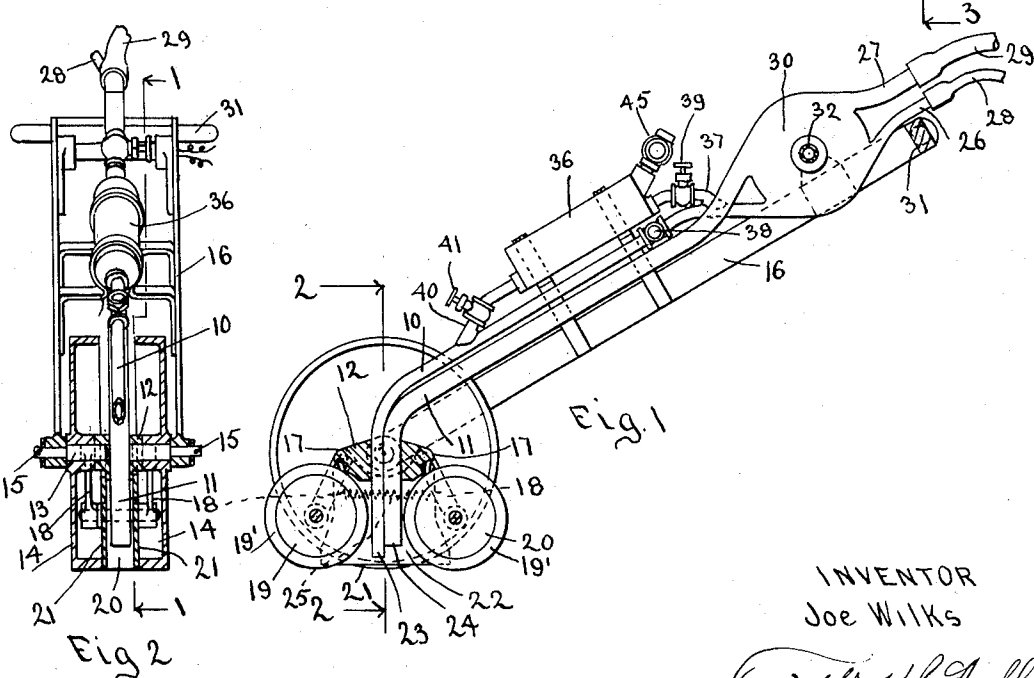
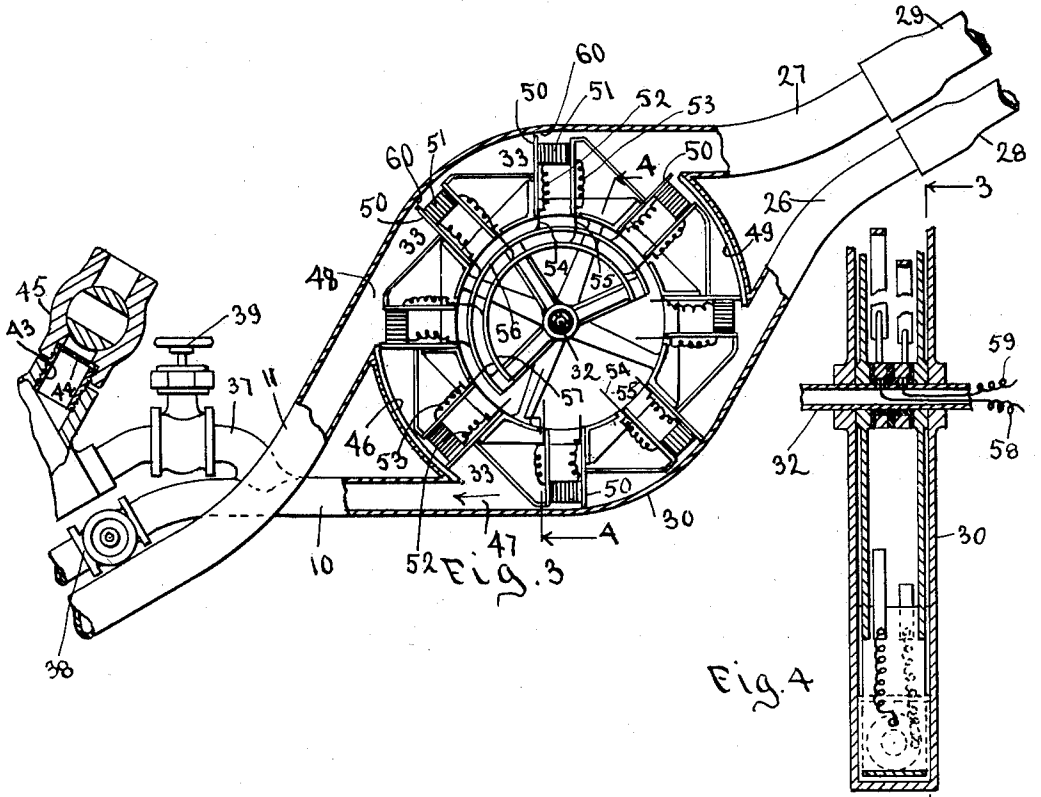
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MACHINE FOR ABRADING CONCRETE SURFACES

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MACHINE FOR ABRADING CONCRETE SURFACES

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7 Claims. (Cl. 51-8)

My invention relates to machines for cleaning and roughening concrete surfaces by means of an abrasive blast.

One object of my invention is to provide a machine of portable nature, that may be moved over the top of a concrete wall in process of construction, to remove the cement skin and to roughen the surface to aid the bonding of a subsequent pouring.

A second object is to provide a machine of this character in which the abrasive may be repeatedly used.

A third object is to provide a machine of this character in which the volume of abrasive material may be varied according to conditions.

A further object is to provide a machine of this character in which an abrasive of ferrous character may be used, and separated from the waste by magnetic means, returning the abrasive to the abrading current.

My invention consists in the novel combination of elements, and the means employed for accomplishing the foregoing objects.

Other objects and novel features will appear in the accompanying specifications and claims, and the drawing forming a part thereof, in which I have described and illustrated a preferred form of my invention.

I do not confine myself to the particular embodiment of my invention described and shown, as modifications may be made within the scope of the appended claims.

In the drawing,

Fig. 1 is a sectional elevation substantially on line 1-1, Fig. 2, of a machine embodying my invention.

Fig. 2 is a sectional end elevation on 2-2, Fig. 1.

Fig. 3 is an enlarged sectional elevation, on line 3-3, Fig. 4.

Fig. 4 is a further enlarged sectional fragment substantially on line 4-4, Fig. 3.

Referring to the drawing, the blast pipe 10, and the vacuum pipe 11, are supported in the element 12, studs 13 projecting in opposite directions serving as journals for the supporting wheels 14, rotatable on either side of the pipes 10, 11, extensions 15 of the studs serving as trunnions on which the frame 16 is swivelled. The element 12 is formed with ears 17, to which are swivelled pairs of links 18. Each link is connected with its opposite link by a stud on which is journaled the wheels 19, 20 rotatable between the wheels 14, and secured to the element 12 and

extending downwardly outside the wheels 19, 20 on either side, are plates 21 forming with said wheels, a chamber 22, open at the bottom, and into which the pipes 10, 11 extend, the discharge end of the blast pipe 10 extending below the inlet of the vacuum pipe 11, the respective ends being designated at 23, 24. The operative parts of the machine are movably supported by the wheels 14, and the wheels 19, 20 supported by the links 18, are retained in yielding engagement with the surface to be operated upon, by means of springs 25. The wheels 19-20 thus form movable opposite walls of the chamber 22, the character of their supporting connections providing for maintaining contact with the surface to be operated upon, back and front, and the side walls 21, extending downwardly nearly to the surface, thus preventing flying particles of debris as the machine is operated and moved on the surface.

I prefer to provide the wheels 19, 20 with rubber tires 19' to further insure contact with the surface where it may be uneven. The pipes 10, 11 connect with a separator to be presently described, other pipes 26, 27 respectively connecting with air pressure supply and with vacuum producing means not shown, flexible connections 28, 29 permitting movement of the machine within reasonable limits across the surface operated upon.

The separator includes a casing 30 rigidly supported on the frame 16 which is provided with a cross bar 31 serving as a handle by means of which the machine may be guided in its operation. Extending through the casing 30 is a hollow shaft 32, on which is journaled a fan wheel 33 formed with a plurality of compartments 33. The walls of these compartments fit the casing sufficiently close to prevent undue leakage of the air pressure as the fan is rotated thereby. This current of air under pressure passes from the separator through the blast pipe 10. Supported in operative relation to the separator and the pipes is a reservoir for abrasive material 36.

In the embodiment shown I use an iron abrasive, but other abrasive material may be similarly stored and supplied to be used with a modified separator. In connection with the reservoir and the blast pipe are suitable connections and valves providing for supplying, removing or regulating the amount of abrasive material supplied to the blast pipe 10, as I will now explain. The reservoir 36 is connected to the blast pipe 10, adjacent to the separator, by a fitting 37, in which valves 38, 39 are provided. At the other end of the reservoir is a similar fitting connect-

ing with the blast pipe 10 as at 40, provided with the valve 41. The reservoir is also provided with a special fitting, comprising the nipple 43, a screen 44 and the valve 45, for the purpose to be presently explained.

The operation for supplying, removing and regulating the amount of abrasive used will be described in connection with the description of the operation of the machine.

As the fan is rotated by the air blast, the blades engage a packed portion 46 of the case, separating the blast outlet 47 from the vacuum inlet 48 to the separator, and similarly the pipes supplying the blast and connecting with the vacuum pipe are separated as at 49. Referring to Figs. 3, 4, the compartments 33 are each formed with a wall 50 which may be magnetized as shown conventionally at 51, leads 52, 53 terminating in brushes 54, 55. Mounted on the hollow shaft 32 are the arcs 56, 57 connected by wires 58, 59 with a source of electric supply not shown. The several elements are suitably insulated in the usual manner, and the arcs are so formed that as the fan is rotated, the brushes engage the respective arcs as the compartments rotate through the portion of rotation acted upon by vacuum action, and the walls 50 are magnetized and attract the iron abrasive particles removing the abrasive from the vacuum current which passes with the debris through the outlet pipe 27 and the flexible pipe 29 to the waste pile.

When the compartment has passed this outlet the respective brushes pass beyond the arcs, the magnetic influence ceases, and the abrasive is returned to the blast current to be again used. In the portion of the casing within the vacuum action, I provide a clearance between the walls 50 and the casing as at 60 to insure improved vacuum action.

The machine is operated in the following manner; with the air blast, vacuum and electric current connected with respective sources of supply, and all valves closed connecting the blast with the separator and the reservoir, the valves 39 and 41 are opened, by-passing the blast through the reservoir and operating to supply the required amount of abrasive to the blast pipe 10. The valve 38 is now opened and the valves 39, 41 closed, and the abrasive passes from the blast outlet 23, abrading the concrete surface, the vacuum operating to remove the debris and abrasive through the pipe 11 to the separator, the iron abrasive being carried beyond the vacuum outlet by the magnetized walls of the several compartments, and as the brushes disengage the arcs, the abrasive is returned to the blast current. When work on the concrete is completed, the valves 39 and 45 are opened, and the valves 38 and 41 are closed thus bypassing the blast into the reservoir, depositing the abrasive and escaping through the valve 45, the screen 44 preventing the escape of abrasive, while permitting the blast to escape. The apparatus may be wheeled over the concrete surface of the wall, abrading preliminary to pouring a subsequent form, and removing the debris leaving a roughened surface.

Having thus described my invention, I claim:—

1. A machine for abrading concrete surfaces comprising a carriage; a chamber supported thereby; rolls rotatably supported by the carriage and bearing on the surface to be cleaned,

forming opposite walls of the chamber; a blast pipe and a vacuum pipe extending into the chamber, having respective outlet and inlet in operative relation to the surface to be cleaned; means for supplying a blast current of abrasive to the blast pipe; and means for applying suction to the vacuum pipe.

2. A machine for abrading concrete surfaces comprising a carriage; a chamber supported thereby; rolls rotatably supported by the carriage and bearing yieldingly on the surface to be cleaned, forming opposite walls of the chamber; a blast pipe and a vacuum pipe extending into the chamber, having respective outlet and inlet in operative relation to the surface to be cleaned; means for supplying a blast current of abrasive to the blast pipe; and means for applying suction to the vacuum pipe.

3. A machine for abrading concrete surfaces comprising a carriage; a chamber supported thereby; rolls rotatably supported by the carriage and bearing on the surface to be cleaned, forming opposite walls of the chamber; a blast pipe and a vacuum pipe extending into the chamber, having respective outlet and inlet in operative relation to the surface to be cleaned; means for supplying a blast current of abrasive to the blast pipe; means for applying suction to the vacuum pipe; and means for separating the abrasive material from the exhaust current and returning it to the blast current.

4. In a machine of the character described in claim 3, a reservoir for containing abrasive material; means for supplying abrasive material to the blast current by passing said current through the reservoir; and means for regulating the amount of abrasive material to be supplied.

5. In a machine of the character described in claim 3, a reservoir for storing abrasive material; means for supplying abrasive material to the blast current by passing the said current through the reservoir; and means for returning the abrasive material to the reservoir by connecting the said current with the reservoir.

6. In a machine of the character described in claim 3, means for separating iron abrasive material from the exhaust current, comprising a housing; inlets thereto and outlets therefrom through which blast and exhaust currents may respectively pass; a member rotatable within the housing and provided with a plurality of compartments, and adapted to separate the currents, and to rotate the compartments alternately through the currents; magnetic means for deflecting the iron abrasive material in the exhaust current while passing through the housing; and means for returning it to the blast current.

7. In a machine of the character described in claim 3, means for separating iron abrasive material from the exhaust current, comprising a housing; inlets thereto and outlets therefrom through which blast and exhaust currents may respectively pass; a member rotatable within the housing and provided with a plurality of compartments, and adapted to separate the currents, and to rotate the compartments alternately through the currents; means for magnetizing a wall of each compartment during its passage through the exhaust current; and means for demagnetizing the wall after such passage.

JOE WILKS.