ETCHING ACID PICK-UP APPARATUS

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References Cited

UNITED STATES PATENTS

1,910,727 5/1933 Walter ......................... 15/49 C

519,100 5/1894 Somers ........................... 15/50


FOREIGN PATENTS OR APPLICATIONS

269,778 10/1950 Switzerland .................... 15/353

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ABSTRACT

An apparatus adapted for retrieving etching fluid used in applying seamless floors, particularly a pick-up head having a power-rotated spiralled brush for throwing liquid upward from the surface over which the brush passes onto an overlying plate which is grooved to channel the liquid toward a central vacuum aperture in the pick-up head.

1 Claim, 3 Drawing Figures
Fig. 1.

Fig. 2.

Fig. 3.

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BACKGROUND OF THE INVENTION

A relatively simple, effective apparatus for removing loose material, such as liquids, from floor surfaces has been an objective particularly in the building trade industries. The use of seamless plastic (troweled epoxy) floor coverings is increasingly popular. Where these are placed over an existing concrete floor surface, the floor must, before application of the plastic covering, be etched. This is also true for areas where a terrazzo surface is to be applied. The etching is usually accomplished by flooding the floor surface with an acidic etching liquid solution. The time this corrosive solution remains on the floor surface must be measured rather closely and removal of the liquid must be rapid.

The structure of the present invention, particularly the pick-up head, provides a means for economically and rapidly removing materials such as liquids or sludges from a floor surface.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a bottom view of the pick-up head, having portions of the brush broken away to show the overlying, radially grooved plate.

FIG. 2 is a side view of the apparatus shown in FIG. 1.

FIG. 3 is a side view of the tank component of the apparatus.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring initially to FIG. 3, reference numeral 10 generally indicates a closed tank which may be mounted on suitable wheels or rollers 11. Within the tank is an electric motor powered blower 12 which discharges through the tube 13 extending from the tank. A baffle plate 14 partially encloses the blower and its drive motor. A float switch 16, actuated to open position when liquid in the tank reaches the level of float 17, functions to deenergize the drive motor for the fan 12 when the liquid level in the tank reaches the indicated point, the tank being then ready for emptying.

The fan 12 reduces the pressure within the closed tank below atmospheric pressure and a fitting and tube 18, communicating with the interior of the tank, extend to the pick-up head indicated generally at 19 in FIG. 2. A tank drain fitting and tube are indicated at 21 (FIG. 3) and, as schematically indicated in FIG. 3, a valve member 21a mounted adjacent the outlet 21 and a valve member 18a mounted adjacent the suction tube 18 are operated in unison, manually, so that when the valve member 18a opens the conduit 18 as shown in FIG. 3, the valve member 21a will have closed the outlet 21. A variable speed control and reversing switch 12a permits reversal of the direction of rotation of the fan 12 and variation in its speed so that when the valve member 18a is closed and the outlet 21a is open, the pressure above the liquid in the tank may be raised to force the liquid from the drain 21 and completely evacuate the tank.

Referring to FIGS. 1 and 2, the pick-up head, remote from the tank, will be described. The head includes an open-faced housing 22 which is adapted to be moved over a floor surface with its open face adjacent to but spaced slightly from the floor surface as will be evident from FIG. 2. Wheels or rollers 23 facilitate movement of the head. As may best be seen in FIG. 2, the arcuate upper wall 22a of the housing is formed to as to provide a transverse trough 27, the upwardly extending portion 22b defining one wall of the trough. A suction aperture or passage 24 in the head communicates with the flexible tube 18. Adjacent the passage 24 is mounted a spiral-type brush 26, the brush extending radially and spirally from a central rod 26a. The brush is journaled in the sidewalls of the housing and an electric motor 28, through a speed reduction drive indicated generally at 29, serves to rotate the brush, the brush being helically or spirally inclined from each end toward the center of the head so that as it tends to give a centrally directed component of force to the material thrown upwardly by the brush. A manually operable variable speed control 28a permits variation of the brush speed.

Overlying the brush and adjacent the curved upper wall 22a of the housing is an inclined plate 31 which extends adjacent the trough 27 and the passage 24. As may best be seen in FIG. 1, the face of the plate 31 adjacent the brush 26 is provided with a series of grooves 32 which extend generally radially of the suction aperture 24, the grooves serving to guide material thrown upwardly against the plate by the brushes centrally toward the trough suction aperture 24.

In operation, with the valve 18a and 21a in the position shown in FIG. 3 and with the fan 12 in operation, below-atmospheric pressure will exist in the passage 24 of the head 19. As the head is moved over a floor or other surface on which liquid or other loose material is to be retrieved, brush 26, rotated at the desired speed by motor 28, will throw the loose material upwardly against the adjacent face of the plate 31, the grooves 32 aiding in guiding the material thrown upwardly by the brush to the suction passage 24. The material, such as a corrosive liquid used in etching floor areas will pass along the plate 31 and collect in trough 27. Material in the trough will be drawn through tube 18 and into the tank to collect in the bottom of the tank. When the level of the material in the tank reaches the float 17 the motor driving the fan 12 will be deenergized and the tank can be emptied. This is accomplished by opening valve 21a and closing valve 18a and, utilizing the reversing switch 12a, causing the fan to rotate in a direction such as to take air in at the tube 18 and raise the pressure in the closed tank to a value somewhat above atmospheric pressure, thereby aiding gravity in driving the material in the tank out through the drain tube 21. When the emptying operation is completed, the valves 18a and 21a may be moved to their positions of FIG. 3 and rotation of the fan altered so that the pressure in the suction aperture 24 is somewhat below atmospheric pressure. The baffle 14 serves to prevent dust or liquid drops from reaching the motor and it will be understood that a dust filter may be installed at the intake of the fan 12. A suitable handle (not shown) may be attached to the head 19, and may incorporate the suction tube 18, so that the head may be conveniently pushed over the floor surface.

I claim:

1. An apparatus for suction removal of loose material from a floor surface or the like comprising a closed tank having an electric motor-powered fan mounted therein for reducing the pressure in the tank below atmospheric pressure, a movable pick-up head remote from said tank, tube means providing communication between the interior of said tank and said head, an open-faced housing adapted to be moved over a floor surface with its open face adjacent to but spaced slightly from the floor surface, a transverse trough formed within said head adjacent its rear margin, a suction aperture in said head communicating with the interior of said trough and with said tube means, a brush extending transverse to the direction of motion of said head and mounted for rotation within said head and adapted to engage the floor surface over which the head is moved, power means mounted on the exterior of the head adapted to rotate said brush so that the portion of said brush at the floor surface moves toward the front margin of said head, a plate mounted within said head to overlie said brush and extending to the front margin of said transverse trough, said plate having a curved configuration with its concave face adjacent said brush and having grooves therein extending generally radially of said suction aperture, whereby loose material on the floor surface is thrown by said brush against said grooved plate face, the grooves guiding said material to said trough for removal therefrom through said suction aperture.

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