

UNITED STATES PATENT OFFICE.

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SURFACING MACHINE.

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To all whom it may concern:

Be it known that I, JOHN A. CAMPBELL, a citizen of the United States, residing at Quincy, in the county of Norfolk and Commonwealth of Massachusetts, have invented new and useful Improvements in Surfacing Machines, of which the following is a specification.

This invention relates to a machine used chiefly for dressing the surfaces of walls, ceilings, etc., composed of terrazzo, or like composition, which is formed while plastic, and has a rough surface when solidified, the machine being adapted to remove the roughness and leave smooth surfaces.

One object of the invention is to provide a simple and effective machine which includes a wheeled carrier, movable on a horizontal support, as a floor, and supporting a motor, a frame which carries the shaft of an abrading tool, and is movable universally, so that the acting face of the tool may be pressed horizontally against a vertical wall, upwardly against a ceiling, and obliquely against an inclined surface, and torque-transmitting connections between the motor and the tool shaft, having sufficient flexibility to permit the required movements of the frame and the tool.

Another object is to provide means for causing the motor to supply water to the acting face of the tool, while the latter is in operation.

The invention is embodied in the improvements hereinafter described and claimed.

Of the accompanying drawings forming a part of this specification,—

Figure 1 is a side elevation of a surfacing-machine embodying the invention, a portion of the casing being broken away, and the abrading tool, its shaft, and a portion of the frame being shown in section, the abrading tool being shown in the position it occupies when bearing on a floor.

Figure 2 is a section on line 2—2 of Figure 1, and an elevation of the parts at the left of said line.

Figure 3 is a section on line 3—3 of Figure 1.

Figures 4, 5 and 6 are fragmentary side elevations showing the tool in different operative positions.

The same reference characters indicate the same parts in all of the figures.

The motor 12 which drives the abrading

tool 13, is supported by a carrier which, as here shown, includes a box-shaped casing 14, and casters, the wheels 15 of which are adapted to run on a floor 16, said casters preferably including yokes 17, pivotally connected with the casing and adapted to turn freely by ball bearings 18, interposed between said yokes and bearing surfaces on the bottom of the casing. The motor 12, which is preferably electric, is supported by standards 19, fixed to the top of the casing. Journaled in bearings 20 on the casing 14, is a horizontal driving-shaft 21, which is connected by gears 22 and 23 with the motor shaft 24.

The abrading tool 13 has an abrasive acting face 13^a, which may be of any desired form. Said tool is fixed to one end of a tool-carrying shaft 25. 26 represents an elbow-shaped frame, including an outer bearing 27 for the tool shaft 25, and an inner bearing 28, at an angle with the outer bearing 27, each of said bearings being preferably composed of two spaced apart sections, as shown by Figure 1, and means rigidly connecting said bearings so that the frame is movable as a unit.

Journaled in the inner bearing 28 is a transmission shaft 29, connected by bevel gears 30 and 31 with the tool shaft.

Flexible torque-transmitting connections are provided between the driving shaft 21 and the transmission shaft 29, the construction and arrangement being such that the housing 26, and the tool 13, are universally movable, and are adapted to occupy various positions with relation to the carrier, as shown by Figures 1, 4, 5, and 6.

When the machine is not in use, the abrading tool may rest on the floor, as shown by Figure 1, and while the machine may be operated for floor surfacing, universal movability of the tool is not particularly desirable in a machine intended solely for surfacing floors.

The frame may be inverted from the position shown by Figure 1, so that the tool faces upwardly, and may act on a ceiling, as shown by Figure 4. The frame may be held with the axis of the tool horizontal, so that the tool may act on a vertical surface, as shown by Figure 5. The frame may also be held with the axis of the tool inclined, so that the tool may act on an inclined surface, as shown by Figure 6. It is obvious that the axis of the tool may assume various ther

operative positions, or inclinations, and that the acting face of the tool may be modified to act on curved instead of flat surfaces.

Said flexible connections are embodied in an intermediate shaft 33, and universal joints 34 and 35, shown by Figure 1, connecting the ends of the intermediate shaft with the driving shaft and the transmission shaft. Said joints are preferably of the type known as gimbal or Hooke joints, and as this type of joint is well known, a description thereof is not necessary.

To supply water to the acting face of the tool 13, I provide the means next described. The acting face 13^a is annular and surrounds a space 36, and the tool shaft 25 is tubular, and communicates with said space.

The lower portion of the casing 14 constitutes a tank, adapted to hold a body of water. In the tank is a pump which, as here shown, includes a casing 38, having an intake 39 (Figure 3), and an outlet 40, and a rotor composed of a hub 41, and blades or buckets 42. A shaft 43, to which the hub is fixed, is journaled in bearings at opposite sides of the pump casing, and has a sprocket wheel 44, connected by a chain 45 with a sprocket wheel 46, on the driving shaft 21.

47 represents a fixed conduit section, communicating with the pump casing outlet 40, and with a flexible conduit section 48, one end of which is connected by a clamp 48^a with a nipple on the frame 26, said nipple communicating with the bore of the tubular tool shaft 25. The rotation of the pump rotor forces water from the pump casing through the conduit sections 47 and 48, the water being discharged into the center of the tool 13. The flexible section 48 may be made in two lengths, connected by a union 48^b, the parts of which are connected to permit one part to turn on the other, the union constituting a swivel connection, preventing constricting twisting of the flexible section. 49 represents a hood detachably secured to the carrier, and formed to cover the casing 14, the motor, and the connections between the motor shaft and the driving shaft, and between the driving shaft and the pump shaft 43. Said casing supports the motor-controlling switch 50, and has an aperture 51, through which the fixed conduit section 47 passes. The carrier may be moved about by a handle 52, attached to the hood.

The frame 26, and the parts connected therewith, are partially counterbalanced by a weight 53, connected by a cord or chain 54 with the frame 26 through a casing member 55, the cord 54 passing over a pulley 56, journaled in a swiveled holder 56^a, which is supported by a bracket 56^b on the hood 49. The weight 53 exerts a pull on the frame and the connected parts, sufficient to enable the operator to easily move the tool 13 about on the surface on which it acts. The casing

member 55, and other casing members 57, 58, 59 and 60, constitute a protective casing enclosing the joints 34 and 35 and the shaft 33, said casing being of the flexible construction shown by Figure 1.

I claim:

1. A surfacing machine comprising, in combination, a wheeled carrier; a driving shaft journaled in the carrier; a motor on the carrier; driving connections between the motor and the driving shaft; a movable frame including an outer bearing, an inner bearing at an angle with the outer bearing, and means rigidly connecting said bearings; a tool shaft journaled in the outer bearing and carrying an abrading tool; a transmission shaft journaled in the inner bearing and geared to the tool shaft; and flexible torque-transmitting connections between the driving shaft and the transmission shaft, including an intermediate shaft and universal joints connecting the ends of the intermediate shaft with the driving shaft and with the transmission shaft, the arrangement being such that said frame is universally movable so that the acting face of the tool may be applied to either a downwardly or an upwardly facing horizontal surface, a vertical surface, or an inclined surface.

2. A surfacing machine comprising, in combination, a wheeled carrier; a driving shaft journaled in the carrier; a motor on the carrier; driving connections between the motor and the driving shaft; a movable frame including an outer bearing, an inner bearing at an angle with the outer bearing, and means rigidly connecting said bearings; a tool shaft journaled in the outer bearing and carrying an abrading tool; a transmission shaft journaled in the inner bearing and geared to the tool shaft; flexible torque-transmitting connections between the driving shaft and the transmission shaft, including an intermediate shaft and universal joints connecting the ends of the intermediate shaft with the driving shaft and with the transmission shaft, the arrangement being such that said frame is universally movable so that the acting face of the tool may be applied to either a downwardly or an upwardly facing horizontal surface, a vertical surface, or an inclined surface, and means counterbalancing the frame and the parts carried thereby, and including a swivelled holder supported by the carrier, a pulley supported by the holder, a cord connected at one end with the frame and passing over the pulley and a weight attached to the opposite end of the cord.

3. A surfacing machine comprising, in combination, a wheeled carrier having a tank; a pump within the tank including a casing having an intake and an outlet, and a rotor in the casing; a driving shaft journaled in the carrier; a motor on the car-

rier; driving connections between the motor, the driving shaft and the pump rotor; a movable frame including an outer bearing, an inner bearing at an angle with the outer bearing, and means rigidly connecting said bearings; a tubular tool shaft journaled in the outer bearing and carrying an abrading tool communicating with the bore of said shaft; a transmission shaft journaled in the inner bearing and geared to the tool shaft; flexible torque-transmitting connections between the driving shaft and the transmission shaft, permitting universal movements of the frame and the parts carried thereby; and a liquid conduit including a section fixed to the carrier and communicating with the pump outlet, and a flexible section extending from the fixed section to the bore of the tool carrying shaft, to supply liquid to the acting face of the tool when the latter is in any position to which it is movable. 15
In testimony whereof I have affixed my signature. 20

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