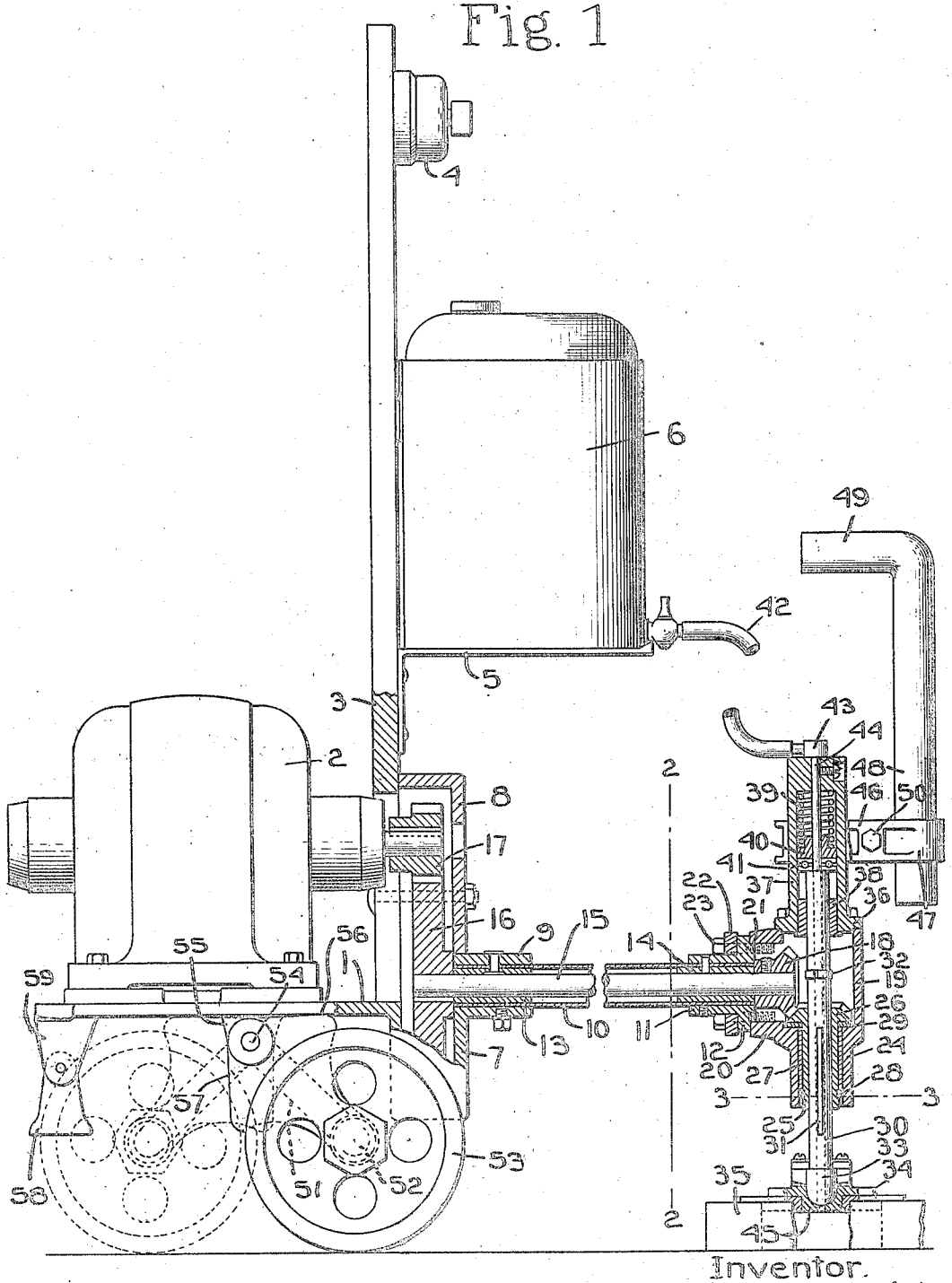
Feb. 2, 1926. 1,571,571

E. CAVICCHI

BASE AND FLOOR BORDER POLISHING MACHINE

Filed Oct. 17, 1924 2 Sheets-Sheet 1

Fig. 1



Inventor.
Ercole Cavicchi
by Heard Smith & Pennock
Attys.

Feb. 2, 1926. 1,571,571

E. CAVICCHI

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Fig. 2

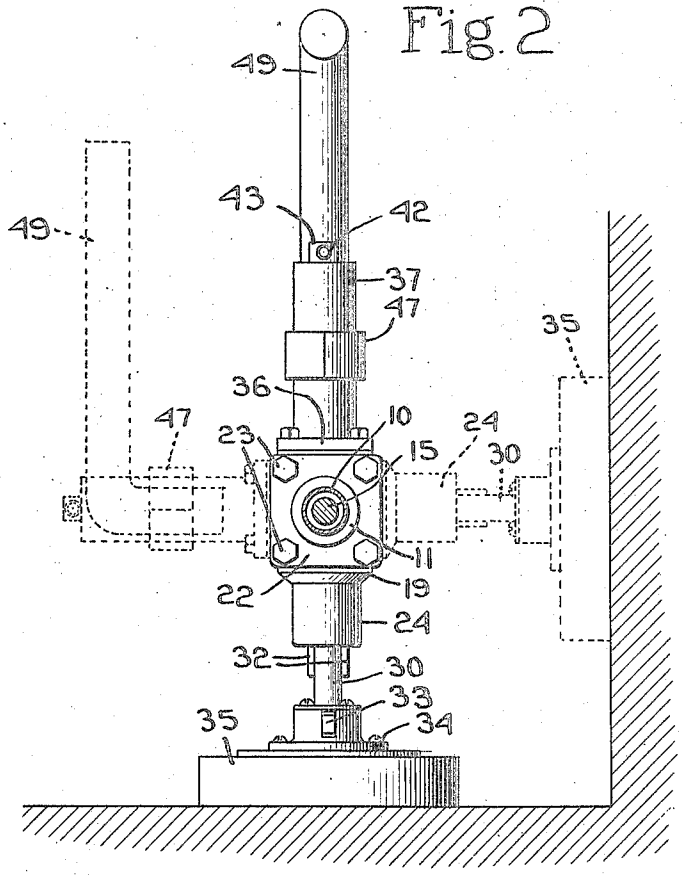


Fig. 3.

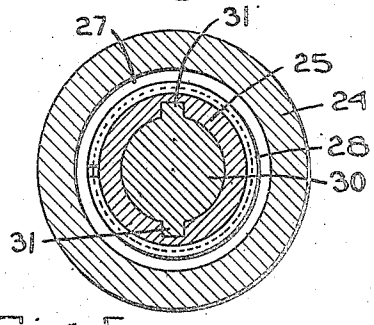


Fig. 4.

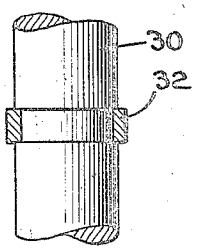


Fig. 5.

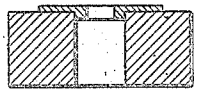


Fig. 6.

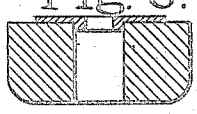
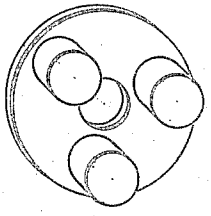


Fig. 7.



Inventor.
Ercole Cavicchi
by Heard Smith & Edmunds
Attys

Patented Feb. 2, 1926. 1,571,571

UNITED STATES PATENT OFFICE

ERCOLE CAVICCHI, OF QUINCY, MASSACHUSETTS.

BASE AND FLOOR BORDER POLISHING MACHINE.

Application filed October 17, 1924. Serial No. 744,136.

To all whom it may concern:

Be it known that I, ERCOLE CAVICCHI, a citizen of the United States, and a resident of Quincy, county of Norfolk, State of Massachusetts, have invented an Improvement in Base and Floor Border Polishing Machines, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to improvements in surfacing machines and the object thereof is to provide a surfacing machine in which the surfacing tool can be set at any required position.

More particularly the invention relates to surfacing machines for surfacing the borders of floors or walls close to their line of junction where usual floor surfacers cannot reach, and also which may be operated to surface straight or beveled junctions between the wall and base, or curved junctions such as are commonly known as sanitary cove bases.

A further object of the invention is to provide a floor surfacer adapted to surface stair treads, steps, and other classes of work which have not heretofore been capable of being treated by a power actuated surfacing machine.

Another object of the invention is to provide a surfacing tool having a frame supporting a motor and a tool so mounted upon wheels that the frame is capable of universal movement.

A further object of the invention is to provide a machine of this character with means for conveniently applying pressure to the rotating tool either in the direction of its axis or when the tool is in any operative position.

A further object of the invention is to provide a surfacing machine of the class described in which the motor-supporting frame is mounted upon wheels which are adjustable relatively to the position of the tool in such a manner that more or less of the weight of the frame and motor may be imposed upon the tool.

A further object of the invention is to provide a machine of the class described with a wheel frame pivotally connected to the motor-supporting frame in such a manner that the wheel axle may be located substantially in the vertical plane of the center of gravity of the tool, or at such distance therefrom as will impose a considerable portion of the weight of the motor and frame upon the tool.

A further object of the invention is to provide a portable surfacing machine comprising a frame having a motor mounted thereupon and provided with an extension enclosing a shaft driven by the motor and a tool-supporting head adjustably mounted upon said extension in such a manner that the tool may be employed to surface the floor or may be rigidly positioned to treat surfaces extending at an angle to said floor.

Other objects and features of the invention will more fully appear from the following description and the accompanying drawings and will be particularly pointed out in the claims.

In the drawings:

Fig. 1 is a side elevation, partially in vertical longitudinal section, of a surfacing machine embodying the present invention;

Fig. 2 is a sectional view on line 2—2 Fig. 1, illustrating in full lines the tool-supporting head with the tool resting upon the floor and the means for applying force to the tool in the direction of its axis of rotation and also illustrating in dotted lines an adjusted position of the tool for surfacing a vertical wall and the means by which force may be applied to the tool when in this position;

Fig. 3 is a detail sectional view on line 3—3 Fig. 1 showing the means by which the tool shaft is slidably mounted in the driving gear in the tool head;

Fig. 4 is an enlarged detail elevation of a portion of the tool shaft showing the means for preventing the shaft from becoming detached from the tool-supporting head; and,

Figs. 5, 6 and 7 are respectively detail views of other preferred forms of tools adapted to be employed in the surfacing machine for different kinds of work.

The surfacing machine illustrated in the acompanying drawings comprises a supporting frame having a base 1 upon which a suitable electric motor 2 is mounted and a vertical standard 3 having mounted thereupon a switch 4 for controlling the motor and

also desirably having mounted thereupon a bracket 5 which supports a liquid-containing tank 6. The front end of the frame also comprises a gear box 7 having a lateral extension upon which a tool-supporting head is preferably adjustably mounted.

As illustrated herein the lower portion 7 of the gear box is integral with the base 1 of the platform and the upper portion of the gear box comprises a cover 8 which is bolted to the standard 3 of the frame. The lateral extension of the frame as illustrated herein comprises a cylindrical boss 9 in which is rigidly secured a tubular member 10 such as a pipe the outer end of which has rigidly secured to it a cylindrical sleeve 11 presenting a circular flange 12. Bushings 13 and 14 within the end portions of said pipe 10 provide bearings for a shaft 15 which is provided at one end with a gear 16 which is engaged by the pinion 17 of the motor shaft. The opposite end of the shaft 15 is provided with a beveled or mitre gear 18 for actuating the surfacing tool as will hereinafter more fully appear. A tool-supporting head 19, preferably in the form of a rectangular or box-like casting, is adjustably secured to the flange 12 of the sleeve 11.

In the present construction the tool-supporting head has a laterally extending rectangular boss 20 provided with a machined end and having a cylindrical aperture therethrough. The flange 12 is provided with a peripheral annular recess the wall 21 of which extends into and fits within the cylindrical aperture in the boss 20. The tool-supporting head is clamped upon the flange 12 by a rectangular collar 22 which engages the opposite sides of the flange and through the corners of which collar bolts 23 extend into the boss 20 of the head.

By reason of this construction the head 19 can be rotatably adjusted about the axis of the shaft 15 to any desired position and clamped in such position by setting up the bolts 23. The head 19 is provided with another boss 24 which preferably extends at right angles to the boss 20 and is longitudinally bored to receive the hub 25 of a mitre gear 26 which meshes with the gear 18 upon the shaft 15, a suitable bushing 27 being interposed between the gear hub and the wall of the boss 24. The sleeve 27 desirably terminates at its lower end above the lower end of the gear and a split ring 28 seated in a groove in the hub at the end of the sleeve serves to prevent relative movement between the hub and the sleeve. A wear plate 29 desirably is interposed between the under face of the gear and the shoulder upon the boss 24. A tool-supporting shaft 30 is slidably mounted in the hub 25 of the beveled gear, but is connected to the gear by one or more feathers 31 which desirably are formed integrally upon the shaft 30 and are slidably mounted in suitable slots milled into the inner wall of the gear hub.

Means are provided for preventing the tool shaft from being withdrawn from the gear when in assembled position, the means illustrated comprising a spring ring 32 which is seated in a recess in the tool shaft 30 and which engages the upper face of the gear 26 upon downward relative longitudinal movement of the tool shaft. The lower end of the tool shaft is connected by a universal joint 33 to a tool head 34 to which the surfacing tool 35 is detachably connected in the usual manner. The tool-supporting head 19 is provided with a rectangular cap 36 having an upwardly extending cylindrical barrel 37 which is in axial alinement with the boss 24 and is provided at its lower end with a bushing 38 to receive the upper end portion of the tool shaft. The upper end of the barrel 37 is closed and contains a helical spring 39 which at its upper end engages the under face of the head of the barrel and at its lower end engages a sleeve 40 which acts upon an anti-friction bearing, such as a ball bearing 41 which engages the upper end of the tool shaft 30.

The helical spring cushions the vibration of the grinding tool so that the operator may, without inconvenience from such vibration, apply to the tool the pressure required to produce the desired abrading or polishing effect.

In order to facilitate the operation of the tool means are provided for supplying liquid from the tank 6 to the tool. As illustrated herein the means comprise a flexible pipe 42 which is connected at its upper end to a suitable faucet in the tank and at its lower end to a head 43 upon a pipe 44 which extends downwardly axially through the sleeve 40, the roller bearing 41, the tool shaft 30 and the universal connection 33 and delivers the liquid through a suitable aperture 45 in the center of the tool 35.

One of the features of the invention consists in providing means by which force may be conveniently manually applied to the tool in the direction of the axis of rotation of the tool in any of its adjusted positions. The preferred means illustrated in the accompanying drawings comprises a bracket 46 which is fixedly secured to the upwardly extending barrel 37 of the tool head and extends laterally therefrom. This bracket is provided with a split socket 47 adapted to receive the end of an L-shaped handle member, one arm 48 of which is longer than the other arm 49. Desirably either end of the L-shaped handle 48 is made of such size as to fit the socket member 47, and adapted to be clamped therein by a bolt 50 which engages the respective sections of the split socket.

When the tool is to be used for surfacing

a floor the longer arm 48 of the member is clamped in the socket member 47 thus enabling the pressure to be applied by the hand of the operator substantially directly above the axis of the tool shaft or in any position of adjustment of the handle about the axis of the arm 48. When the tool is adjusted for surfacing a vertical wall or other walls located in angular relation to the floor the shorter arm 49 may be clamped in the socket member 47 as illustrated in dotted lines in Fig. 2. The longer arm 48 will then extend a convenient distance above the floor to enable the operator to apply pressure to the tool in the direction of its axis conveniently. Obviously either the longer or shorter arm may be connected to the socket member 47 when the tool head is in other positions of adjustment to enable the tool to be manipulated most conveniently.

One of the principal features of the invention is to provide a portable surfacing machine in which the tool, although rotatably mounted in a rigid support upon the frame, can be moved about universally so that any surface may be treated irrespective of its position. This is accomplished by pivotally mounting the supporting frame upon the axle of the wheel so that the entire frame is capable of tilting movement which will permit the tool to be raised and lowered vertically while the wheels which engage the floor can be moved in any direction.

A further object of the invention is to provide a wheel support for a surfacing machine of the character described in which the position of the wheels may be adjusted to impose more or less of the weight of the frame, motor and tool head upon the tool. This may be accomplished by providing means for adjusting the axle of the wheel relatively to the supporting frame in the direction of the extension 10 by which the tool-supporting head is carried.

Another feature of the invention consists in providing a wheel support in which the axle of the wheels is located substantially in the plane of the center of gravity of the machine so that in transporting the machine from place to place the tool can be readily raised from the floor and the machine drawn from one place to another without having the tool engage the floor. These objects are accomplished by providing a wheel frame which is pivotally mounted to the supporting frame in such a manner that the wheel axle can be located substantially in the plane of the center of gravity of the machine, or swung rearwardly from such plane into a position in which a large proportion of the weight of the machine will be imposed upon the surfacing tool. As illustrated the wheel-supporting frame comprises a bracket 51 at one end of which is mounted the axle 52 of a wheel or wheels 53. The bracket 51 is pivotally mounted upon a shaft or upon pivots 54 in bosses 55 projecting downwardly from the under face of the base 1. The brackets 51 are provided with surfaces 56 and 57 disposed substantially at right angles to each other adapted to engage the under face of the platform 1. The axis of the pivot 54 is so arranged with respect to the base of the machine that when the wheel 53 is in the forward position illustrated in Fig. 1 the axis of the axle 52 of the wheels 53 will be approximately in the vertical plane of the center of gravity, but when the wheels 53 are moved to the position illustrated in dotted lines in Fig. 1 the axis 52 of the wheels will be positioned at such distance from the center of gravity that a substantial portion of the weight of the machine will be carried by the tool.

Desirably a leg 58 is pivotally mounted in bosses 59 projecting downwardly from the rear end of the base to provide a support for the machine when the same is tilted upwardly with the wheel 53 in the forward position illustrated in full lines in Fig. 1. Thus when the machine is not in use it will be firmly supported with the surfacing tool out of engagement with the floor.

In Figs. 5, 6 and 7 different forms of tools are illustrated which may be substituted for the tool illustrated in Fig. 1. In Fig. 5 a small annular tool is illustrated in vertical section presenting a flat working surface. In Fig. 6 a similar tool is illustrated in vertical section as provided with a curved lower peripheral edge, this tool being particularly adapted for finishing concavedly curved surfaces such as sanitary cove bases. In Fig. 7 a different form of tool is illustrated having a plurality of cylindrical abrading members secured to a ring which is adapted to be detachably secured to the tool head 34.

It will be obvious that by reason of the construction herein illustrated and described a surfacing machine is provided which is adapted to treat the surfaces along the borders of floors or walls and which can conveniently be adjusted for the treatment of surfaces disposed in angular relation to the base or walls. The machine desirably, but not necessarily, is of a small size adapted to work upon borders of floors or walls and upon stair treads, steps, and other varieties of work which heretofore have been incapable of being surfaced by a power-actuated machine. It will however, be obvious that the machine can be made of large size and used for surfacing floors and other walls within the scope of the invention as defined by the claims.

It will be understood that the embodiment of the invention particularly disclosed herein is of an illustrative character and is not restrictive and that various changes in

form, construction and arrangement of parts may be made within the spirit and scope of the following claims.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A portable surfacing machine comprising a frame having a lateral extension rigidly connected thereto, a motor mounted upon said frame, a tool-supporting head mounted on said extension and rotarily adjustable about the longitudinal axis thereof, a surfacing tool having a shaft rotatably mounted in said head and means operable by said motor for rotating said tool.

2. A portable surfacin machine comprising a frame having a lateral tubular extension rigidly connected thereto, a motor mounted upon said frame, a tool-supporting head mounted on said extension and rotarily adjustable about the longitudinal axis thereof, a surfacing tool having a shaft rotatably mounted in said head, means operable by said motor for rotating said tool and a wheel support for said frame operable to permit universal movement of said tool relatively to the plane of the wheel base.

3. A portable surfacing machine comprising a frame having a lateral extension, a motor mounted upon said frame, a tool-supporting head adjustably mounted on said extension, a surfacing tool having a shaft rotatably mounted in said head, means operable by said motor for rotating said tool, a tool-controlling handle detachably connected to said head and means for selectively positioning said handle to permit pressure to be applied to said tool in the direction of its axis of rotation at different distances from its axis of rotation.

4. A portable surfacing machine comprising a frame having a rigid lateral extension, a motor mounted upon said frame, a tubular tool-supporting head mounted on said extension and rotarily adjustable about the longitudinal axis thereof, a surfacing tool having a shaft rotatably mounted in said head, means operable by said motor for rotating said tool, an L-shaped handle having arms of different lengths and means for detachably connecting either of said arms to said head in substantial parallelism to the axis of said tool shaft whereby said handle may be conveniently positioned to apply pressure to said tool in the direction of its axis of rotation when the tool-supporting head is in different positions of adjustment.

5. A portable surfacing machine comprising a frame having a rigid lateral extension, a motor mounted upon said frame, a tubular tool-supporting head mounted on said extension and rotarily adjustable about the longitudinal axis of said extension, a surfacing tool having a shaft rotatably mounted in said head, means operable by said motor for rotating said tool, a wheel frame pivotally mounted on said supporting frame to swing about an axis extending at right angles to the direction in which said extension projects from said frame, wheels mounted upon said wheel frame and means for limiting the swinging movement of said brackets to change the position of the center of gravity of the machine relatively to the tool.

6. A portable surfacing machine comprising a frame having a lateral extension, a motor mounted upon said frame, a tool-supporting head mounted on said extension, a surfacing tool having a shaft rotatably mounted in said head, means operable by said motor for rotating said tool, a wheel frame pivotally connected to said supporting frame to swing about an axis so located that when in one position the wheel axle will lie in approximately the vertical plane of the center of gravity of the machine at right angles to the direction of said extension and a pair of wheels mounted upon said wheel axle to rotate about an axis parallel to the axis of its pivotal connection to said motor-supporting frame and means for limiting the respective movements of said wheel frame about its axis in either direction.

7. A grinding machine comprising a frame, a motor mounted upon said frame, a grinding tool having a vertical shaft and means operable by said motor for rotating said grinding tool, a wheel frame pivotally connected to said motor-supporting frame to swing about an axis so located that when in one position the wheel axle will lie in approximately the vertical plane of the center of gravity of the machine, wheels mounted on said wheel axle to rotate about an axis in parallelism to the pivotal axis of said frame and means for limiting the respective movements of said wheel frame about its axis in either direction.

8. A portable surfacing machine comprising a supporting frame, a motor mounted upon said frame, a lateral extension from said frame rigidly connected thereto and having bearings therein and provided with a flanged end, a shaft rotatably mounted in said bearings, means for actuating said shaft from said motor, a tool-supporting head, means for adjustably clamping said head upon said flanged end to permit rotary adjustment about the axis of said shaft, a surfacing tool having a shaft rotatably mounted in said head and means for rotating said tool shaft from the shaft mounted in said extension.

9. A portable surfacing machine comprising a supporting frame, a motor mounted upon said frame, a lateral extension from said frame rigidly connected thereto and having bearings therein and provided with a flanged end, a shaft rotatably mounted in said bearings, means for actuating said

shaft from said motor, a tool-supporting head, means for adjustably clamping said head upon said flanged end to permit adjustment thereof about the axis of the shaft in said extension, complementary beveled gears mounted respectively upon said shaft and in said head, a tool shaft slidably connected to the gear in said tool-supporting head and rotatable thereby and a surfacing tool universally connected to the end of said tool shaft.

10. A portable surfacing machine comprising a supporting frame, a motor mounted upon said frame, a lateral extension from said frame rigidly connected thereto and having bearings therein and provided with a flanged end, a shaft rotatably mounted in said bearings, means for actuating said shaft from said motor, a tool-supporting head, means for adjustably clamping said head upon said flanged end to permit adjustment thereof about the axis of the shaft in said extension, complementary beveled gears mounted respectively upon said shaft and in said head, a tool shaft slidably connected to the gear in said tool-supporting head and rotatable thereby, a surfacing tool universally connected to the end of said tool shaft and resilient means acting upon the opposite end of said tool shaft.

11. A portable surfacing machine comprising a supporting frame, a motor mounted upon said frame, a lateral extension from said frame rigidly connected thereto and having bearings therein and provided with a flanged end, a shaft rotatably mounted in said bearings, means for actuating said shaft from said motor, a hollow tool-supporting head, means for adjustably clamping said head upon said flanged end to permit adjustment thereof about the axis of the shaft in said extension, complementary beveled gears mounted respectively upon said shaft and in said head, a tool shaft slidably connected to the gear in said tool-supporting head and rotatable thereby, a surfacing tool universally connected to the end of said tool shaft, resilient means acting upon the opposite end of said tool shaft and means connected to said shaft within said head for preventing the tool shaft from becoming detached from said head.

12. A portable surfacing machine comprising a supporting frame, a motor mounted upon said frame, a lateral extension from said frame rigidly connected thereto and having bearings therein and provided with a flanged end, a shaft rotatably mounted in said bearings, means for actuating said shaft from said motor, a tool-supporting head, means for adjustably clamping said head upon said flanged end to permit adjustment thereof about the axis of the shaft in said extension, complementary beveled gears mounted respectively upon said shaft and in said head, a tool shaft slidably connected to the gear in said tool-supporting head and rotatable thereby, a surfacing tool universally connected to the end of said tool shaft, a liquid-containing tank mounted upon said motor-supporting frame and means for conducting liquid therefrom through said tool shaft and tool.

In testimony whereof, I have signed my name to this specification.

ERCOLE CAVICCHI.