Apr. 24, 1923. **1,452,926**

A. ORLANDO

POLISHING MACHINE

Filed Feb. 2, 1922. 2 Sheets-Sheet 1

Fig. 2.

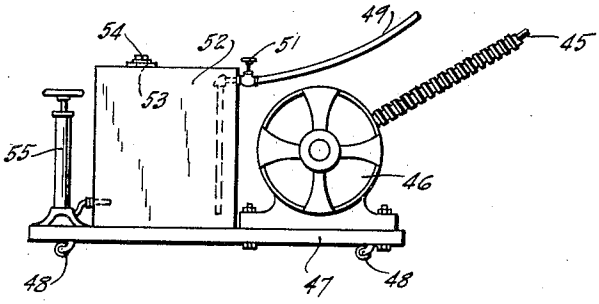


Fig. 1.

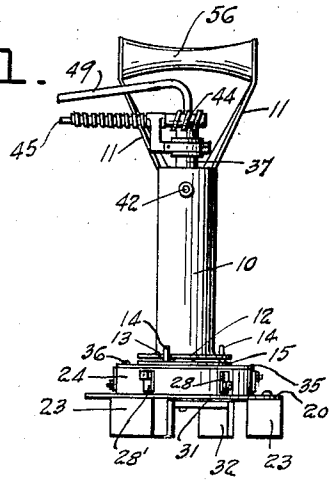


Fig. 3.

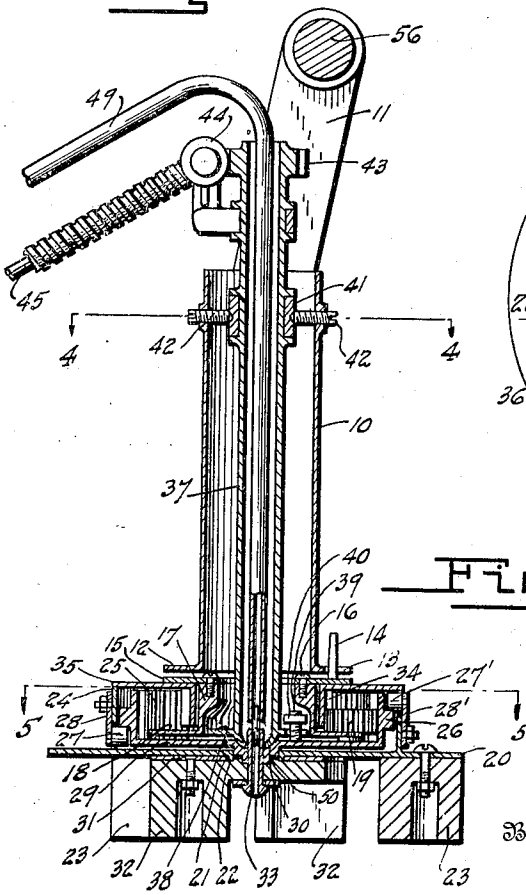


Fig. 4.

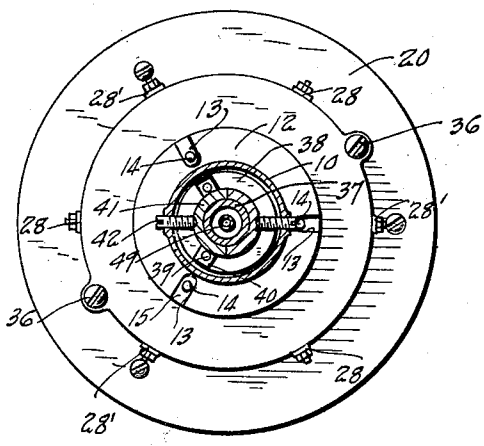
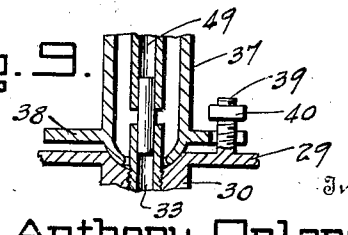


Fig. 9.



Inventor

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A. ORLANDO

POLISHING MACHINE

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Fig. 7.

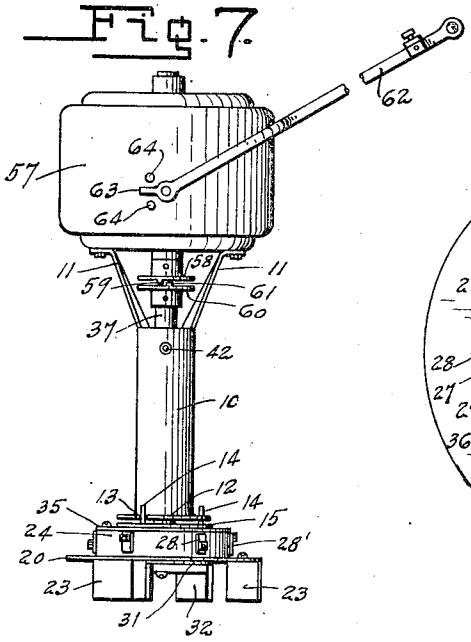


Fig. 5.

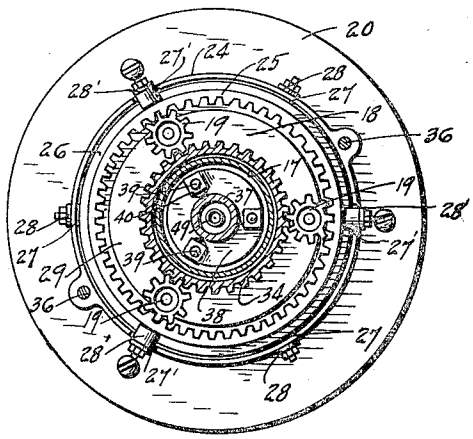


Fig. 6.

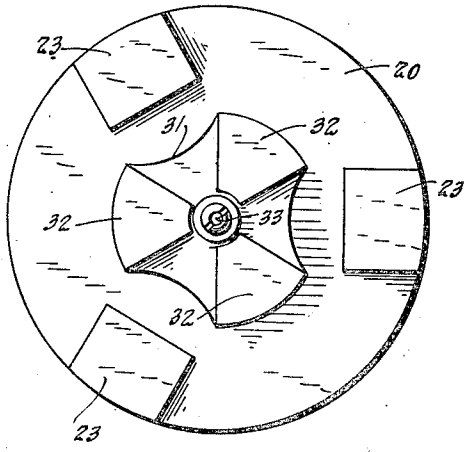


Fig. 8.

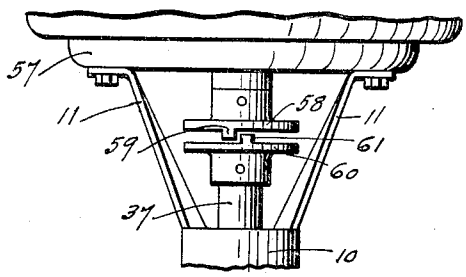
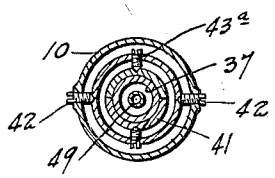


Fig. 10.



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Patented Apr. 24, 1923. 1,452,926

UNITED STATES PATENT OFFICE.

ANTHONY ORLANDO, OF CHATTANOOGA, TENNESSEE.

POLISHING MACHINE.

Application filed February 2, 1922. Serial No. 533,602.

To all whom it may concern:

Be it known that I, ANTHONY ORLANDO, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented certain new and useful Improvements in Polishing Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to polishing machines, more particularly to a machine for use in polishing terrazo bases, stairway and wainscoting, although not limited to these uses.

An important object of the invention is to provide in a device of this character, which is necessarily small and must be controlled by the hand of the operator, a flexible connection between the guiding mechanism or hand engaged portion of the tool and the polishing portion thereof.

A further object of the invention is to provide a construction in the polishing and scrubbing mechanism whereby the tractive tendency of the polishing elements is overcome.

A further object is to provide a construction of this character which readily lends itself to use either in the connection above mentioned or in scrubbing floors, the construction being such that the elimination of the handle element and the replacing thereof by a unitary motor drive is readily accomplished.

A further object is to provide an improved drive and construction whereby the above results may be accomplished.

These and other objects I attain by the structure shown in the accompanying drawings wherein for the purpose of illustration specific embodiments of my invention are illustrated and wherein like reference characters designate like parts throughout.

In the drawings:

Figure 1 is a side elevation of the terrazo polishing device;

Figure 2 is a side elevation of the drive and water supply truck employed in conjunction therewith;

Figure 3 is a vertical sectional view taken through the polishing machine shown in Figure 1;

Figure 4 is a section on the line 4—4 of Figure 3;

Figure 5 is a section on the line 5—5 of Figure 3;

Figure 6 is a bottom plan view thereof;

Figure 7 is a side elevation of a modified form in which a direct motor drive is employed; and

Figure 8 is an enlarged fragmentary detail view showing the driving connections between the motor and drive shaft of the polishing and scrubbing device.

Figure 9 is an enlarged sectional view showing the joint between the plate and tubular shaft; and

Figure 10 is a sectional view showing a gimbal joint employed for supporting the shaft within the handle.

Referring now more particularly to the drawings, the numeral 10 indicates a tubular casing provided at its upper end with upwardly extending divergent arms 11. The lower end of the casing is provided with a horizontal flange 12 having spaced radial slots 13 formed therein. These slots are adapted for the reception of vertically extending pins 14 carried by a horizontally extending plate or ring member 15 which ring member is secured, as at 16, to a vertical sleeve 17. The sleeve 17 is provided at its lower end with a horizontally extending flange 18 having rotatably mounted thereon horizontally disposed planet gears 19.

The numeral 20 designates a plate provided centrally with an opening 21 defined by a downwardly extending flange 22 and this plate has secured thereto adjacent the periphery thereof and in spaced relation, polishing or abrading elements 23. Upon its upper surface the plate 20 is provided with an annular upstanding sleeve 24.

Mounted within the sleeve 24 is an internal gear 25 meshing with the planet gears 19 and forming the orbit gear of the train. This gear has formed upon the outer surface thereof an annular shoulder 26 which rests upon rollers 27 carried by plates 28 secured upon the exterior face of the sleeve 24 and extending through openings formed in the sleeve. The shoulder 26 is maintained in position upon the rollers 27 by similar rollers 27′ abutting the upper surface of the shoulder and carried by plates 28′ similar to the plates 28.

The internal gear 25 is in the form of a peripheral flange extending upwardly from a plate 29 having a portion 30 extending through the central opening of the plate 20. The numeral 31 indicates a second abrasive carrying plate having abrasive or

polishing elements 32 secured thereto and having a driving connection with the portion 30 of the plate 29. This driving connection is of such a nature as to afford central aligned apertures 33 through the enlargement 30 and plate 31 for a purpose presently to appear. The numeral 34 indicates a sun gear rotating exteriorly of the sleeve 17 and meshing with the planet gears 19. To the upper surface of this sun gear is secured a cover or drive plate 35 which is secured to the upstanding sleeve 24 of the plate 20, as indicated at 36.

The numeral 37 indicates a tubular shaft disposed interiorly of the casing 10 and provided adjacent its lower end with an out-turned flange 38 having openings therein through which extend securing elements 39 engaged with the plate 29. The heads 40 of these elements are spaced from the plate 29 a greater distance than the thickness of the flange 38 so that the shaft 37 is capable of limited oscillatory movement with respect to the plate and at the same time has a driving connection therewith. Adjacent its upper end the shaft 37 is mounted in bearings 41 having pivotal connection, as at 42, with the casing 10, or a gimbal joint connection such as shown at 43^a in Fig. 10 may be employed between the shaft and bearing. The lower end of the shaft has a ball and socket engagement with the plate 29.

Any suitable drive may be provided for the shaft 37. In the present instance the shaft 37 is provided upon its upper end with a worm gear 43 which is driven by a worm 44 from a flexible shaft 45 receiving its rotation from the armature shaft of a motor 46. The motor 46 is mounted upon a suitable portable base 47, being disclosed in the present instance as provided with casters 48. The connection of the shaft 45 with the shaft 37 will preferably be such as to permit the insertion in the upper end of the shaft of a flexible tube 49, the lower end of which is provided with an extension 50 rotatably extending into the opening 33 of the plates 29 and 31 respectively. This tube 49 is connected to a valve 51 which in turn connects with a tank 52 mounted upon the base 47. The tank 52 has a filling opening 53 closed by an air tight plug 54 and means, as a hand pump 55, are provided for forcing fluid under pressure into the tank to insure delivery of the water from the tank through the tube 49.

The upwardly extending arms 11 of the casing 10 may have secured thereto a handle 56 for engagement by a hand of the operator, as shown in Figure 1, or these upwardly extending arms 11 may be employed as supports for a motor 57, as disclosed in Figure 7. In the latter construction the worm gear and flexible shaft are, of course, eliminated and some other suitable form of flexible drive employed. In the present instance the armature shaft of the motor is disclosed as provided with a face plate 58 having projecting downwardly therefrom a single tooth 59 and the upper end of the shaft 37 is disclosed as provided with a similar face plate 60 having extending upwardly therefrom and into the path of the tooth 59, a tooth 61. This construction will permit of relative movement of the armature shaft of the motor and the shaft 37 and at the same time provide a continual drive. Where the motor is employed, a handle 62 will be used which is pivoted to the motor casing and which is provided with a lug 63 operating between lugs 64 formed on the motor casing thereby permitting limited movement of the handle relative to the motor. It will be observed that in each of the constructions set forth the mounting and arrangement of the handle is such as to eliminate so far as possible the stress caused by vibration and movement of the lower or polishing portion of the device from the handle thereof.

In the use of the device, when the motor is started the rotation thereof is transmitted through the flexible shaft and shaft 37 to the plate 29 causing rotation of the plate 31 secured thereto in one direction. The rotation is likewise transmitted to the sun gear 34 through the medium of the planet gears 19 but in a reverse direction to the direction of rotation of the plate 31. From the sun gear the motion is transmitted to the plate 20 through the plate 35 and sleeve 24. It will, therefore, be seen that in my device two sets of abrasive elements are employed, one rotating within the other, the abrading elements rotating in opposite directions. By this construction the tractive effect of the abrading or polishing elements is practically eliminated. In the use of the machine water is fed from the tank 52 and controlled by the valve 51 through the tube 49 to the center of the polishing disks affording a continual supply as will be necessary in polishing terazzo or in scrubbing or polishing floors. The structure disclosed is particularly effective and useful when employed with the type of hand machine disclosed in Figure 1, since in this type of machine the tractive effect of the abrading or scrubbing members is noticeable, the strain being placed directly upon the hand of the operator and the operator not being provided with such leverage as is afforded by a handle of the type shown in Figure 7.

From the foregoing it is believed to be obvious that a polishing or scrubbing machine constructed in accordance with my invention is particularly well adapted for the use for which it is intended by reason of the

fact that the operation thereof is materially simplified and by reason of the fact that it is possible to place upon the machine a greater amount of force during the operation thereof than is possible where the polishing elements all rotate in one direction. It will likewise be obvious that the construction hereinbefore set forth is capable of many changes and modifications without in any manner departing from the spirit of my invention and I accordingly do not limit myself to the construction thereof except as hereinafter claimed.

What I claim is:

1. In a polishing machine, co-axial plates, polishing elements carried by the plates, planetary gearing connected with the plates and including a sun gear connected with one of the plates, an orbit gear connected with the other of the plates and a plate upon which the planet gears are mounted, a handle member, means connected with the handle member for preventing rotation of the plate upon which the planet gears are mounted and means extending longitudinally of the handle for driving said orbit gear.

2. In a polishing machine, co-axial plates, polishing elements carried by the plates, planetary gearing including a plate upon which the planet gears are mounted, means preventing rotation of said plate, a connection between the orbit gear of the planetary gearing and one of said co-axial plates, and a connection between the sun gear of the planetary gearing and the other of the co-axial plates forming a housing for the planetary gearing.

3. In a polishing machine, co-axial plates, portable polishing elements carried by the plates, planetary gearing connected with the plates and including a plate upon which the planet gears are mounted, a hollow handle member, means connected with the handle member for preventing rotation of the plate upon which the planet gears are mounted, and means extending longitudinally of the handle member for driving one of said plates.

4. In a polishing machine, co-axial plates, portable polishing elements carried by the plates, planetary gearing connected with the plates and including a plate upon which the planet gears are mounted, a handle member, and a connection between said handle member and planet gear plate preventing relative rotation thereof and permitting limited relative angular movement thereof.

5. In a polishing machine, co-axial plates, polishing elements carried by the plates, planetary gearing connected with the plates and including a plate portion upon which the planet gears are mounted, a handle member, means connected with the handle member for preventing rotation of the plate upon which the planet gears are mounted, and means extending longitudinally and interiorly of the handle member for driving one of said plates.

6. In a polishing machine, co-axial plates, polishing elements carried by the plates, planetary gearing connected with the plates and including a plate portion upon which the planet gears are mounted, a handle member, means connected with the handle member for preventing rotation of the plate upon which the planet gears are mounted, means extending longitudinally and interiorly of the handle member for driving one of said plates, and means extending longitudinally and interiorly of said driving shaft for delivering fluid to the surface to be polished.

7. In a polishing machine, co-axial plates each bearing polishing elements, means for rotating one of said plates, a sun gear secured to one of said plates, an orbit gear secured to the other of said plates, planet gears engaged with said sun and orbit gears, a plate upon which said planet gears are mounted, and means for preventing rotation of said plate.

8. In a polishing device, co-axial plates, polishing elements carried by the plates, planetary gearing connected with the plates and including a plate upon which the planet gears are mounted, a handle member normally co-axial with the plates, means connected with the handle member for preventing rotation of the plate upon which the planet gears are mounted, and means for delivering fluid axially of the handle member and plates to the surface to be polished.

In testimony whereof I hereunto affix my signature.

ANTHONY ORLANDO.