Sept. 1, 1942. O. W. THRAILKILL 2,294,814

FLOOR POLISHING MACHINE

Filed May 6, 1941 3 Sheets-Sheet 1

Fig. 13.

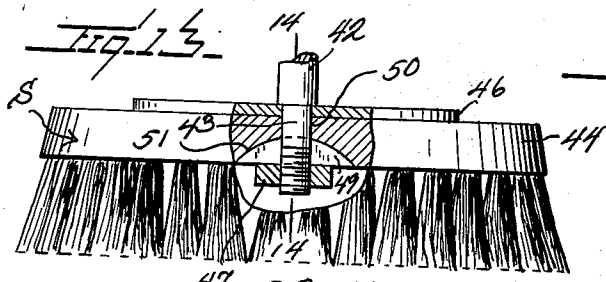


Fig. 15.

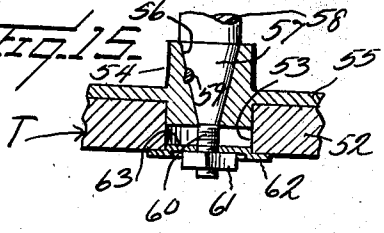


Fig. 14.

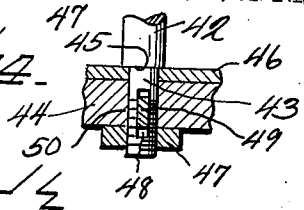


Fig. 16.

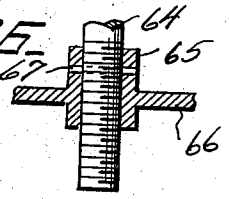


Fig. 3.

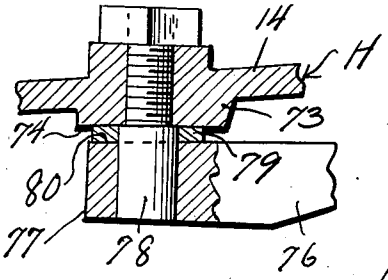


Fig. 2.

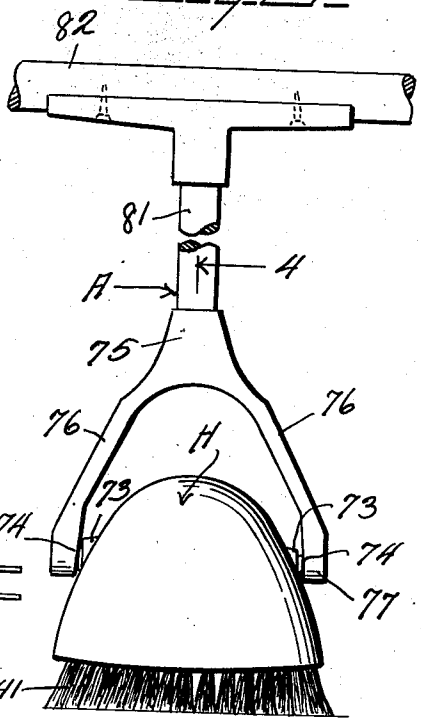
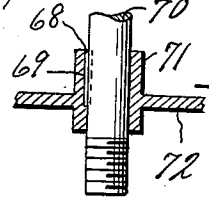


Fig. 1.

Fig. 17.



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Sept. 1, 1942. O. W. THRAILKILL 2,294,814

FLOOR POLISHING MACHINE

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Fig 4

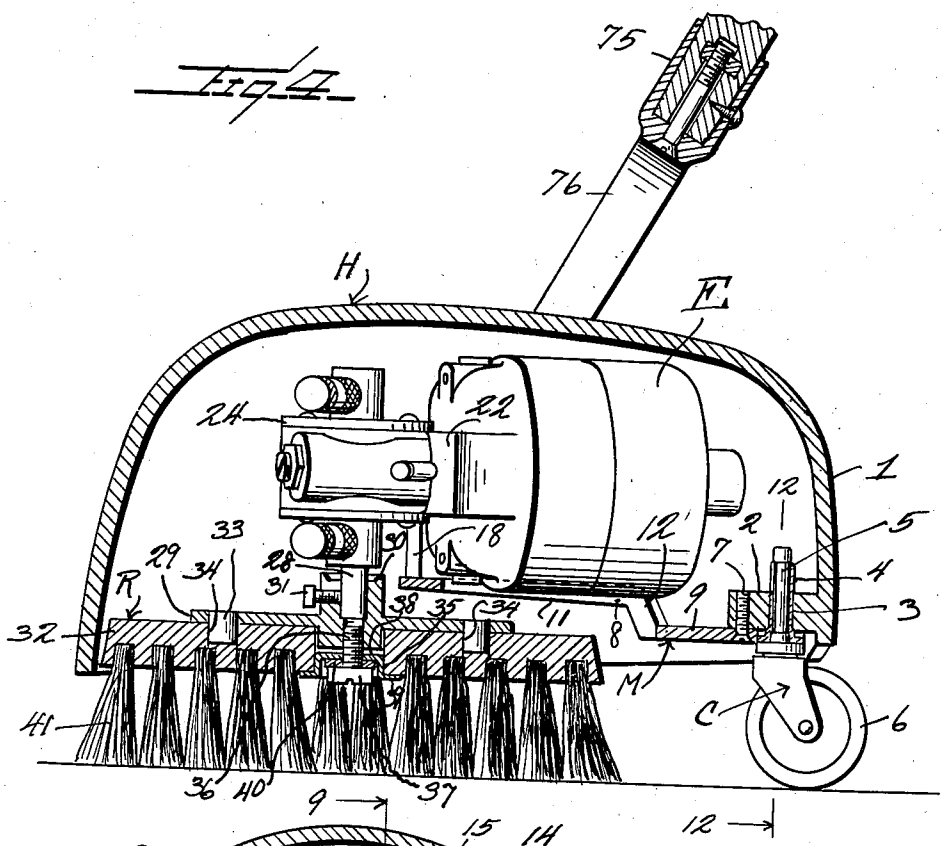
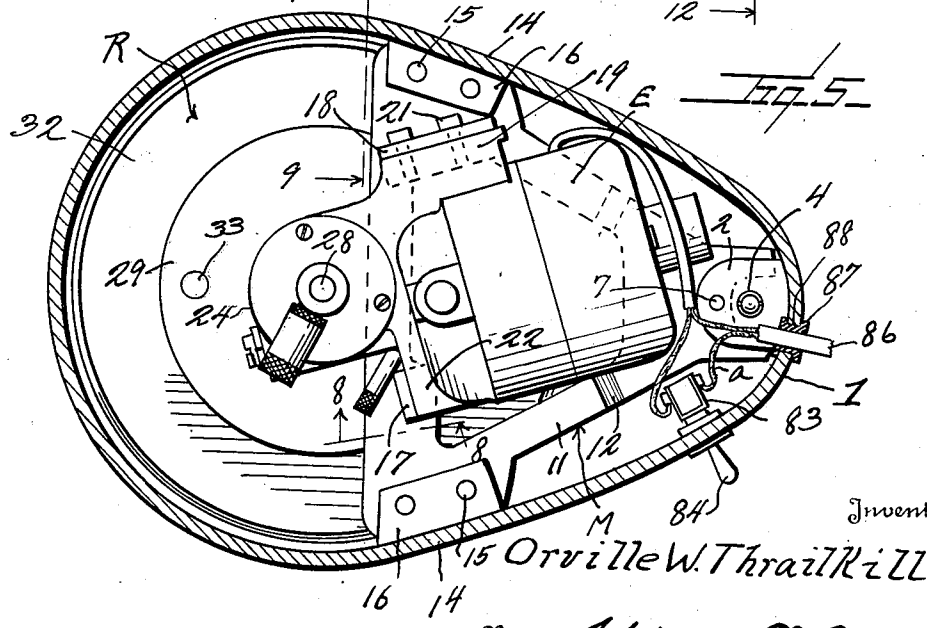


Fig 5



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Sept. 1, 1942. O. W. THRAILKILL 2,294,814

FLOOR POLISHING MACHINE

Filed May 6, 1941 3 Sheets-Sheet 3

Fig. 6

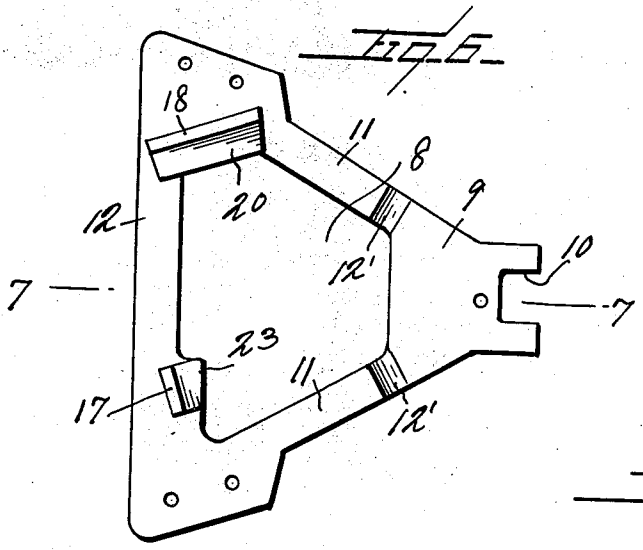


Fig. 8

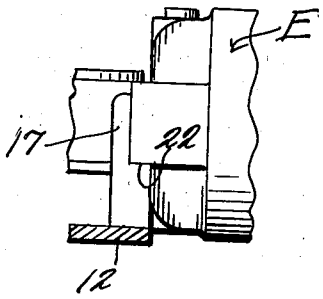


Fig. 9

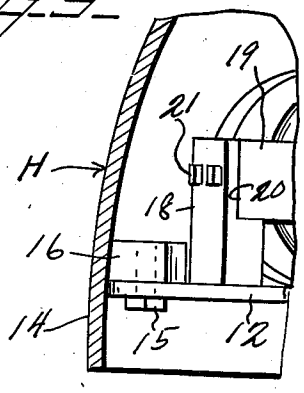


Fig. 7

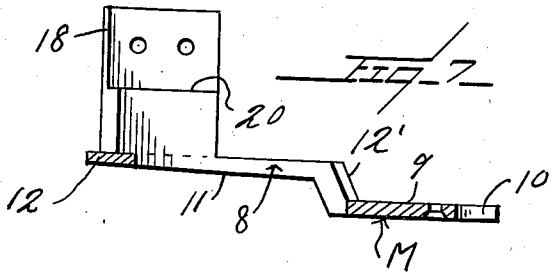


Fig. 11

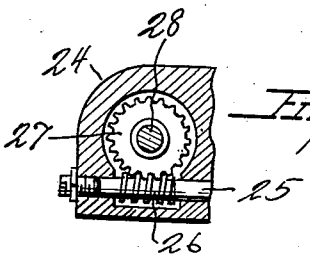


Fig. 10

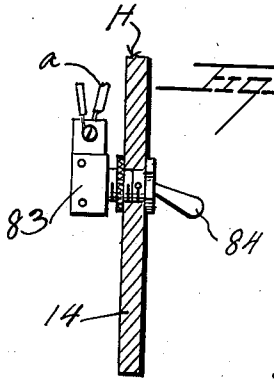
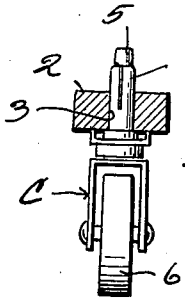


Fig. 12



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Patented Sept. 1, 1942 2,294,814

UNITED STATES PATENT OFFICE

2,294,814

FLOOR POLISHING MACHINE

Orville W. Thrailkill, Wellington, Kans.

Application May 6, 1941, Serial No. 392,154

4 Claims. (Cl. 15—49)

This invention relates to a floor polisher and has relation more particularly to a device of this kind embodying a rotary polishing member driven by an electric motor.

It is an object of the invention to provide a device of this kind wherein the driving means for the floor engaging member constitutes a unit so constructed and arranged as to be readily mounted within a protecting housing.

It is also an object of the invention to provide a machine of this kind including a housing for the surface engaging member and the driving means therefor, and wherein the housing is provided with means whereby its direction of travel may be quickly changed as the requirements of practice may necessitate, and in a manner to provide for straight, circular or any desired direction of movement of the machine, and also within a small area.

Another object of the invention is to provide a machine of this kind wherein the surface engaging member is driven by an electric motor, and wherein the operating circuit for such motor has interposed therein a circuit maker or breaker so positioned as to be readily and conveniently operated when desired by a foot of the operator.

An additional object of the invention is to provide a machine of this kind including a housing for the surface engaging member and the operating means therefor, and wherein said housing has operatively engaged therewith a handle member for manually moving the machine as desired, the operative connection between the handle member and the housing being such that the handle member when pushed into a substantially vertical position will be maintained in such position when the machine is not in use.

A still further object of the invention is to provide a device of this kind comprising a housing in the general form of an elongated inverted bowl with the lower face thereof open with a skeletonized member supported within the lower or open portion of the housing to provide a mounting for the motor and the ground engaging member carried and operated by the motor.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved floor polisher whereby certain important advantages are attained, as will be hereinafter more fully set forth.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a view in side elevation of a polishing machine constructed in accordance with an embodiment of my invention, a portion of the handle member being in section;

Figure 2 is a view in front elevation of the machine as illustrated in Figure 1, the end portions of the cross bar of the handle member being broken away;

Figure 3 is an enlarged fragmentary view taken substantially on the line 3—3 of Figure 1;

Figure 4 is an enlarged vertical sectional view taken substantially on the line 4—4 of Figure 2;

Figure 5 is an enlarged horizontal sectional view taken substantially on the line 5—5 of Figure 1;

Figure 6 is a view in top plan of the skeletonized member or plate herein embodied; and on which the motor is mounted;

Figure 7 is a sectional view taken substantially on the line 7—7 of Figure 6;

Figure 8 is a detailed sectional view taken substantially on the line 8—8 of Figure 5;

Figure 9 is a detailed sectional view taken substantially on the line 9—9 of Figure 5;

Figure 10 is a fragmentary detailed view partly in section and partly in elevation illustrating the circuit maker and breaker as herein comprised;

Figure 11 is a fragmentary view partly in section and partly in elevation illustrating the driving connection between the motor shaft and the shaft for the surface engaging member;

Figure 12 is a fragmentary view partly in section and partly in elevation, the line of section being substantially on the line 12—12 of Figure 4;

Figure 13 is a fragmentary view, partly in section and partly in elevation, illustrating a modified form of connection between the surface engaging member and its shaft;

Figure 14 is a detailed sectional view taken substantially on the line 14—14 of Figure 13;

Figure 15 is a fragmentary view partly in section and partly in elevation illustrating another embodiment of the invention for securing the surface engaging member to its shaft;

Figure 16 is a detailed view, partly in section and partly in elevation, illustrating another means for attaching the surface engaging member to its shaft; and

Figure 17 is a view, partly in elevation and partly in section, illustrating a still further means of attaching the surface engaging member to its shaft.

As disclosed in the accompanying drawings, H denotes a housing which is in the form of an elongated bowl. This housing H is relatively deep but slightly increases in depth from one end toward the other and also slightly decreases in width from one end toward the other with the narrow part being at the same end portion as the shallow part of the housing. One face of the housing is open and in practice this open face is downwardly disposed. The narrow part of the housing is at the rear and the rear wall 1 of the housing at substantially its transverse center and closely adjacent to the lower or open face of the housing is provided with the inwardly disposed lug 2. This housing 1 and the lug 2 are formed from any suitable material and may be of any color preferred. It is to be pointed out, however, that the housing H is of such configuration as to afford a stream-line effect and is light in weight. It is also to be pointed out that the outer surface of the housing H is smooth and unobstructed, thus allowing the same to maintain an attractive appearance.

The lug 2 has directed therethrough an opening 3 of desired diameter and through which is inserted from below a spring sleeve 4, this sleeve 4 having disposed therethrough the shank 5 of a caster C. This caster C is preferably of a ball-bearing type so that the roller 6 comprised therein may have free turning movement about the axis of its shank 5 to facilitate the travel of the machine over the floor or other surface with which the machine is used.

Secured by the bolt 7, or otherwise as may be preferred, to the under surface of the outer end portion of the lug 2 is the rear portion of a skeletonized member or plate M. As is particularly illustrated in Figure 6, this member or plate M is substantially in the form of an equilateral triangle and formed to provide a large central opening 8. It is the apex portion 9 of the member M which is secured to the lug 2 and the outer extremity of this portion 9 is cut away, as at 10, to allow said portion 9 of the member or plate M to straddle the depending end portion of the sleeve 4 so that no hindrance or obstruction will be offered to the desired assembly. The side arms 11 of the member or plate M immediately adjacent to the apex portion 9 are upwardly offset, as at 12', so that the major portion of said arms 11 will be positioned a desired distance above the apex portion 9 of the member M to assure desired placement of the rotating surface engaging member R. The base or wide end portion 12 of the plate or member M substantially bridges the space between the side walls 14 of the housing H and is secured from below by the bolts 15, or otherwise as may be preferred, to the inwardly disposed lugs 16 formed with the side walls 14 of the housing H. As disclosed in the accompanying drawings, it is believed to be apparent that the member or plate M may be readily applied or removed.

The outer end portion 12 of the member or plate M is provided with the transversely spaced upstanding posts 17 and 18 which provide supports for an electric motor E. The forward portion of this motor E is provided with a laterally directed block 19 which is received within a rabbet 20 in the top of the post 18 and held to said post 18 by the bolts 21. The casing for the motor E at the opposite side is provided with a forwardly directed block 22 which rests from above within a rabbet 23 at the top of the second post 17, and by this means the motor E is effectively mounted within the housing H. The casing for the motor E is also formed to provide a forwardly extending boxing 24 into which extends the drive shaft 25 of the motor E. This shaft 25, as particularly illustrated in Figure 11, carries a worm 26 meshing with a worm wheel 27 fixed to the perpendicularly related shaft 28. This driven shaft 28 carries the surface engaging member R, as is clearly illustrated in Figure 4 of the drawings.

As disclosed in Figure 4 the member R comprises a disk or plate 29 of desired dimensions and which is provided at its axial center with a hub 30 extending beyond opposite sides of the plate 29. The outer end portion of the shaft 28 freely and snugly engages within one end portion of the hub 30 and said hub 30 is keyed or locked to the shaft 28 by a screw 31 threading through the wall of the hub 30 and having desired engagement with the inserted end portion of the shaft 28.

The plate 29 overlies and has close contact with the central portion of a circular back 32. This back 32 is of a radius closely approximating the radius of the adjacent forward end of the housing H, as is clearly illustrated in Figure 5 of the drawings. The plate 29 is provided with the lugs 33 extending beyond a face of the plate 29 and snugly engaged within the recesses 34 provided in the rear face of the back 32. The lugs 33, as herein disclosed, are radially aligned and are equidistantly spaced at opposite sides of the axial center of the plate 29. It is believed to be obvious that the number of these lugs 33 and their associated recesses 34 may be increased and differently arranged if preferred, as it is only necessary that these lugs 33 and recesses 34 be sufficient to create an effective driving engagement between the plate 29 and the back 32, and thus relieve from undue strain the direct connection between the hub 30 of the plate 29 and the shaft 28.

The portion of the hub 30 which extends beyond the outer or lower face of the plate 29 is received within an opening 35 extending through the back 32 at the axial center of the back 32, and within this extended end portion of the hub 30 threads the shank 36 of a holding bolt. The head 37 of this bolt engaged from below a cap-like washer 38 which snugly engages within the opening 35 and is provided with a marginal flange 39 which engages the lower or outer face of the back or head 32 under the action of the head 37 of the bolt, whereby the back or head 32 and the plate 29 are maintained effectively in relative assembly.

As illustrated in Figure 4 the head 37 and the adjacent portion of the cap member or washer 38 have interposed therebetween a conventional washer 40 mounted in the usual way upon the shank 36.

The back or head 32 has extending from its lower or outer face suitably arranged and comparatively heavy tufts 41 of bristles or other preferred material. These tufts are arranged in close assembly so that the outer end portions thereof will have an effective coaction with the floor or other surface. These tufts 41 are also of pronounced length, for a purpose to be hereinafter more particularly set forth.

I do not wish to be understood as limiting myself to the particular means, as illustrated in Figure 4, for connecting the back or head 32 to its driven shaft. As illustrated in Figures 13 and 14 of the drawings, the lower or outer end

portion of the driven or perpendicular shaft 42 is continued by a reduced extension 43 which freely passes through the axial center of the back or head 44 for the surface engaging member S. This reduced portion 43 provides a shoulder 45 which has close contact with the upper or outer face of the disk-like plate 46. The extension 43 of the shaft 42 is of a length to extend beyond the outer or under surface of the head 44 so that a conventional holding nut 47 threaded on the extension 43 will hold the plate 46 and back or head 44 in assembled relation and upon the extension 43. The extension 43 has disposed longitudinally and radially thereof an elongated slot 49 through which is disposed a segmental key 49 of a length to extend beyond the opposite sides of the extension 43. The opening 50 in the head or back 44 and the plate 46 through which the extension 43 passes is disposed through the central portion of a slot 51 in which the key 49 snugly engages, with the straight edge of the key 49 substantially flush with the under or outer face of the head or back 44.

In the embodiment of the invention as illustrated in Figure 15 the back or head 52 of the surface engaging member T is provided through its axial center with a relatively large opening 53 which snugly extends an end portion of a hub 54 at the axial center of the plate 55 in contact with the central portion of the upper or rear face of the head or member 52. This hub 54 has its bore 56 tapered from its upper or inner end toward its lower or outer end and in which is snugly received a tapered portion 57 provided at the lower end of the perpendicular shaft 58 for the member T. Disposed through the hub 54 and having interlocking engagement with both the hub 54 and the tapered portion 57 of the shaft 58 is a key 59 herein disclosed as substantially semi-circular in cross section. The smaller or outer end of the tapered portion 57 is continued by an extension 60 on which threads a holding nut 61. This nut 61 coacts with a washer 62 having engagement with the portion of the outer or under surface of the member or head 52 surrounding the opening 53. This washer 62 has a central part 63 offset to snugly engage within the adjacent end portion of the opening 53.

In the form of connection as illustrated in Figure 16 the shaft 64 for the surface engaging member has its lower or outer end portion freely disposed through a central hub 65 carried by a plate 66. This plate 66 is to be mounted upon the rear or upper face of the back or head of the surface engaging member in substantially the same manner as hereinbefore set forth with respect to the plate 28 and head or member 32. It is to be stated at this time that the plate 55, as illustrated in Figure 15, is also to have driving connection with the back or head 52 in the same manner. Disposed through one end portion of the hub 65 and the shaft 64 is a pin 67 whereby the shaft 64 and plate 66 are tied for unitary rotation.

In Figure 17 a form of connection is disclosed wherein the key 68 is fitted within keyways 69 disposed in a direction lengthwise of the shaft 70, and provided in opposed portions of the shaft 70 and the hub 71 carried by the plate 72. This plate 72 is maintained in desired assembly with respect to the back or head of the surface engaging member in the same manner as hereinbefore set forth with respect to the plate 28 and the head or back 32, or otherwise as may be preferred.

The housing H has its side walls provided with the outstanding lugs 73 integrally formed therewith and having their outer end faces 74 flat and in substantially parallel planes. These outer end faces 74 are also substantially at right angles to the plane of the lower or open face of the housing H. It is also to be particularly pointed out that these lugs 73 are located substantially centrally of the housing H and more particularly at the center of weight of the housing and the parts arranged therein to assure such balance of the housing H with respect of the handle member A to allow the surface engaging member to have immediate flat contact with the surface to be treated. This mounting of the handle member A with respect to the housing H also assures the surface engaging member to have effective coaction at all times with the surface and also allows pressure to be imposed upon the housing in a manner to result in effecting an outward flaring of the tufts 41 and particularly at the marginal portion of the head or back 32 to allow the machine to be operated efficiently up against quarter-round molding or baseboards, and to polish out corners. It is also to be pointed out that normally the marginal tufts 41 are so flared as to extend slightly beyond the periphery of the head or back 32 to increase the efficiency of the machine.

The handle member A as herein disclosed comprises a forked member 75, the arms 76 of which outwardly diverge so that the member 75 may readily straddle the housing H from above. The outer or free end portions of the arms 76 are provided with the short parallel extensions 77 which closely approach the outer faces 74 of the lugs 73. Each of these extensions 77 is operatively engaged with a pintle 78 which threads within a side wall of the housing H at the axial center of a face 74 of a lug 73. Interposed between the outer face 74 of each of the lugs 73 and the inner face of an extension 77 is a washer 79 mounted on a pintle 78. It is to be noted that these opposed faces 74 and 80 of an extension 77 are in planes angular one with respect to the other so that when the handle member A is moved or swung upwardly and forwardly there will be a resultant binding action to maintain the handle member in a substantially vertical or upright position which is of advantage when the machine is not in use. The member 75 is suitably fixed to an end portion of an elongated rod 81 of desired length, and mounted in any manner desired upon the outer or upper end portion of the rod 81 is a cross handle bar 82.

The side wall 14 of the housing H, and preferably the wall at the left side of the housing, has secured to its inner face a circuit maker and breaker 83 including an operating lever 84 which extends exteriorly of the housing H through a suitably provided opening 85. This opening 85 and, of course, the circuit maker and breaker 83 are positioned closely adjacent to the lower or open face of the housing H and also at a point closely adjacent to the rear end of the housing so that the operating lever 84 may be readily and conveniently contacted by the toe portion of a foot of the operator when it is desired to start or stop the motor E. This circuit maker and breaker 83 is, of course, interposed in one of the conductors *a* comprised in the operating circuit for the motor and these conductors *a* are continued as a cable 86 out through a bushing 87 of insulated material snugly fitted within

an opening 88 in the rear portion of the housing. This cable 86 is of any desired length and is provided at its outer end with a conventional plug 89 to be engaged, in a well-known manner, with a wall socket or other suitable and convenient source of electrical energy.

The rod 81 of the handle member A at a suitable point intermediate its ends is provided with a downwardly facing hook member 90. The extended portion of the cable 86, when the machine is not in use, is wrapped or coiled around this hook 90 and the handle bar 82. By the use of a single hook 90 very convenient and fast winding of the cable 86 is allowed.

The various parts of the machine as herein disclosed are to be made of such materials as preferred, such as aluminum, bronze, steel, stainless steel, metal alloys and plastics.

The machine as herein comprised is constructed and designed to meet with favor with the housewife, housekeeper, etc. where rooms and floor areas are small. It is also constructed for beauty, light weight, and fast polishing, and is of such simple construction to eliminate tinkering or breaking to frustrate the user.

While the action of the tufts 41 is ordinarily sufficient, when it is desired to obtain a burnished effect a pad may be thrown on the surface and the member R set thereon. The pad so placed will ride under the brush to produce the effect desired.

From the foregoing description it is thought to be obvious that a floor polisher constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated.

I claim:

1. A surface polishing machine comprising an elongated housing having its bottom face open, an inwardly disposed lug carried by an end of the housing adjacent to its open bottom face, inwardly disposed lugs carried by the housing and at the longitudinal central portion of the housing, a plate within the lower portion of the housing, means for anchoring said plate to the lugs, a caster operatively engaged with the first lug, a power unit within the housing mounted upon the plate and including a casing and a drive shaft, a boxing carried by the casing for the motor into which the extended shaft is received, a vertical shaft rotatably supported by the boxing and in driven connection with the drive shaft of the motor, said shaft extending below the boxing, and a surface engaging member mounted on the lower portion of the driven shaft for rotation therewith.

2. A surface polishing machine comprising an elongated housing having its bottom face open, an inwardly disposed lug carried by an end of the housing adjacent to its open bottom face, inwardly disposed lugs carried by the housing and at the longitudinal central portion of the housing, a plate within the lower portion of the housing, means for anchoring said plate to the lugs, a caster operatively engaged with the first lug, a power unit within the housing mounted upon the plate and including a casting and a drive shaft, a boxing carried by the casing for the motor into which the extended shaft is received, a vertical shaft rotatably supported by the boxing and in driven connection with the drive shaft of the motor, said shaft extending below the boxing, and a surface engaging member mounted on the lower portion of the driven shaft for rotation therewith, the plate secured to the lugs being entirely to one side of the driven shaft and having its inner portion disposed above the surface engaging member.

3. A machine of the class described comprising a housing having its lower face open, lugs carried by the housing at an end thereof and by the sides, the lug at the end of the housing being positioned at substantially the transverse center thereof and adjacent to the lower open face of the housing, a plate within the housing, means for securing the plate to the lugs, a power unit mounted on the plate including a driven unit disposed toward the open face of the housing, a surface engaging member carried by and rotating with said shaft, a caster wheel carried by the lug at the end of the housing, and a handle member operatively connected with the housing.

4. A surface polishing machine comprising a housing having its bottom face open, a power unit, means for supporting said unit within the housing, said unit including a casing having an extended drive shaft and a boxing carried by the casing to receive the extended drive shaft, said boxing being free of connection with the housing, a second shaft carried by the boxing and depending therefrom, said second shaft being in driven connection with the drive shaft, said second shaft being also free of connection with the housing, and a surface engaging member mounted on and rotating with the shaft.

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