

May 11, 1943.

N. N. OKUN

2,318,960

FLOOR POLISHING MACHINE

Filed March 19, 1941

2 Sheets-Sheet 1

Fig. 1

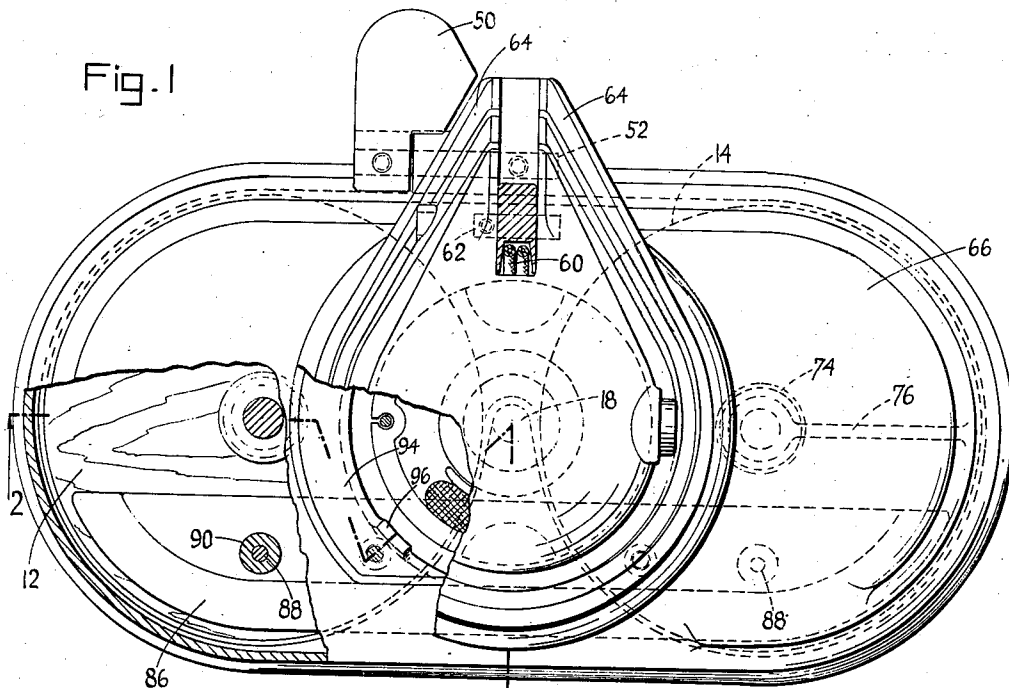
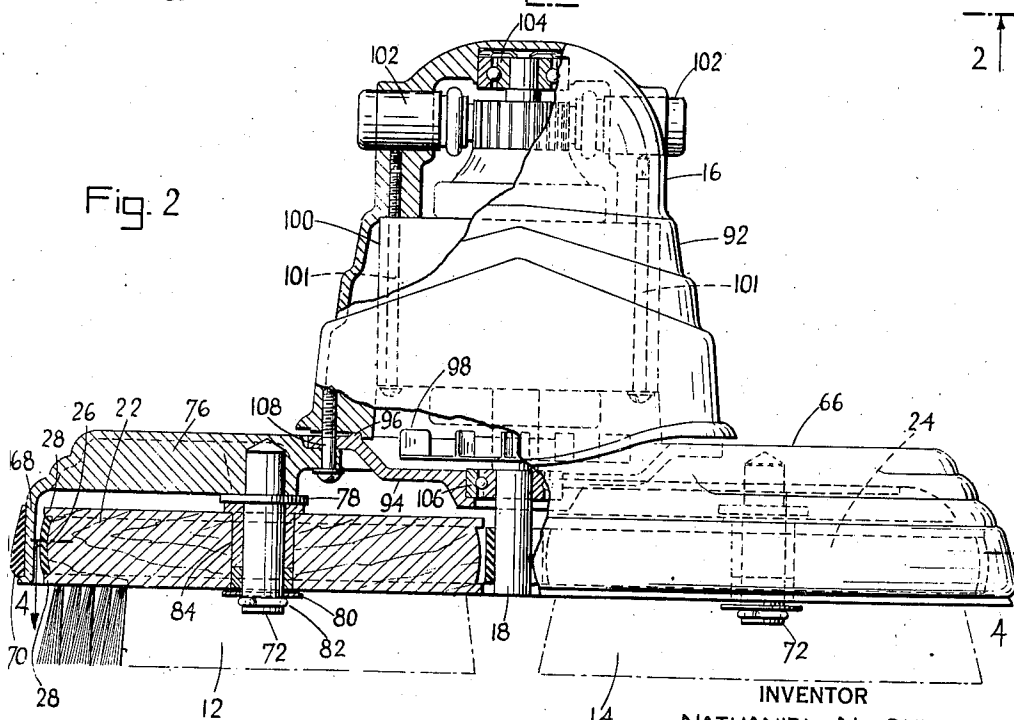


Fig. 2



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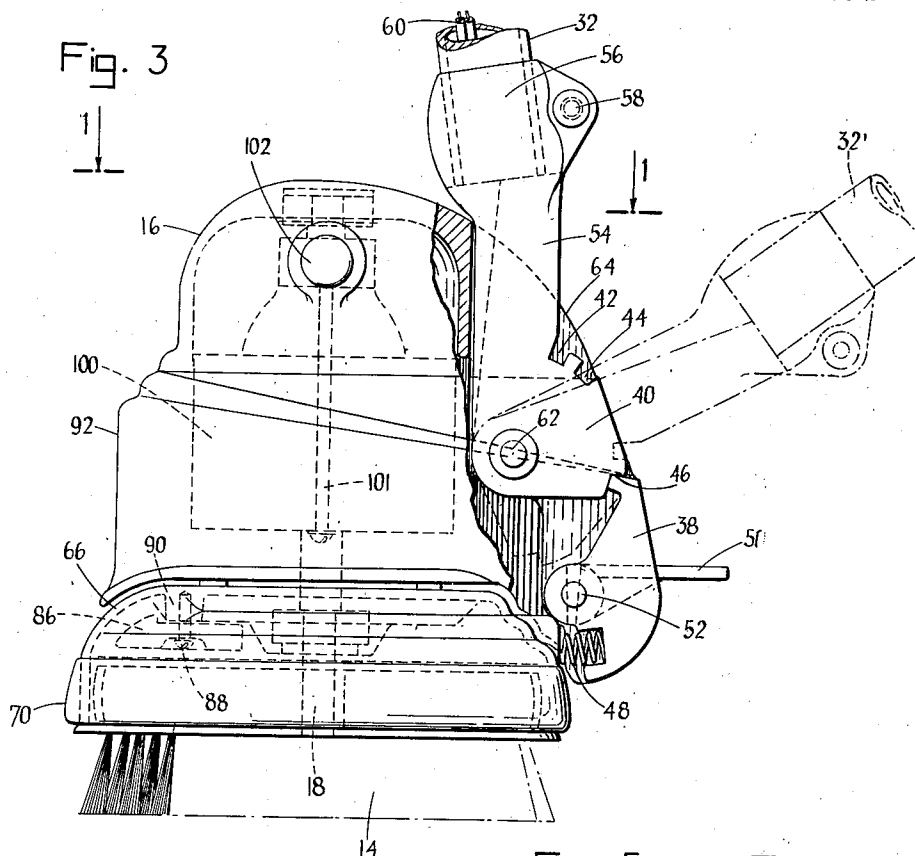
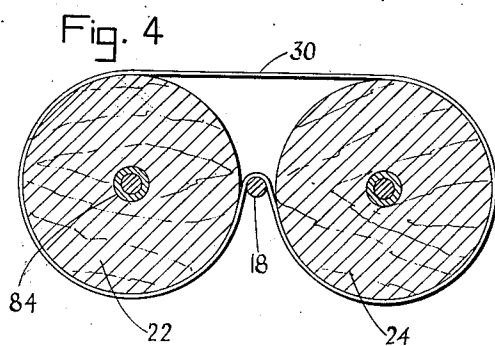
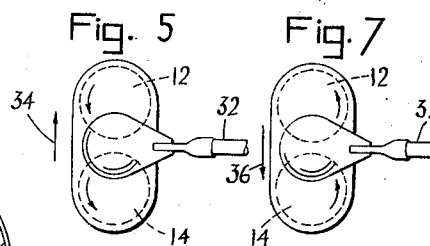
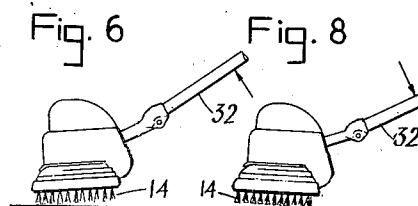
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,318,960

FLOOR POLISHING MACHINE

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Application March 19, 1941, Serial No. 384,032

2 Claims. (Cl. 15-49)

This invention relates to floor-treating machines, particularly for household use, and similar light-duty operation.

The primary object of my invention is to generally improve floor polishing machines. A more particular object is to provide a comparatively small, light-weight, simple and inexpensive floor polishing machine adapted for household use, yet having an efficiency and effectiveness in operation reasonably comparable to that of larger and more elaborate machines.

One specific object is to facilitate movement of the machine over the surface of the floor being polished. With this object in view, the machine is provided with two circular brushes rotating in the same direction on upright axes. A handle extends from the machine, preferably perpendicular to a line connecting the centers of the brushes, and is preferably provided with means such as a dog and notched quadrant for locking the handle to the machine at a desired angle. In this way, the machine may be tilted toward the forward edges of the brushes or toward the rear edges of the brushes, whereupon the machine automatically moves toward one side or the other, depending on which way the machine is tilted. The dog and notched quadrant arrangement may also be used to hold the handle in upright position when storing away the machine.

In accordance with a further feature and object of the invention, the machine is provided with a balance weight, this being so designed as to balance the machine when stored away, in order to provide equal distribution of weight on the brush bristles. This prevents the bristles from being deformed out of desired symmetry during non-use of the machine.

Further features of the invention center about the mechanical structure of the machine, with a view to simplification and reduction in cost. In accordance with one such feature, the brushes are carried on cylindrical studs which are driven upwardly into receptive holes in the housing of the machine. The brushes may be detachably held on the studs by means of split rings sprung into grooves at the lower ends of the studs. The machine may be made self-lubricating, and for this purpose the brushes are preferably provided with graphite-impregnated bushings. The driving motor may be provided with self-lubricating ball bearings.

The driving connection between the motor and the brushes is preferably devoid of reduction gearing or similar relatively expensive mechanism. Instead, the motor is provided with a

vertical shaft the lower end of which is located between the brushes. The peripheries of the brushes may, if desired, be flanged and crowned to form pulley surfaces, and a single, preferably live rubber belt extends around the pulley surfaces and around the lower end of the motor shaft, which acts as a small-diameter pulley. The belt drive is effective even though the motor shaft is disposed immediately adjacent the brushes, because the belt extends around the motor pulley surface for substantially 180°, and extends around the brushes for substantially 270°.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, my invention consists in the floor polishing machine elements and their relation one to the other, as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by drawings in which:

Fig. 1 is a horizontal section taken approximately in the plane of the line 1-1 of Fig. 3, with parts of the housing cut away;

Fig. 2 is a section taken in elevation in the plane of the line 2-2 of Fig. 1;

Fig. 3 is a side elevation with a part of the housing broken away to expose the dog and notched quadrant for the handle;

Fig. 4 is a horizontal section taken in the plane of the line 4-4 of Fig. 2, and is explanatory of the belt drive;

Figs. 5 and 6 are schematic plan and side elevations, respectively, showing how the machine may be made to move in one direction; and

Figs. 7 and 8 are plan and side elevations, respectively, showing how the machine may be made to move in the other direction.

Referring to the drawings, the machine comprises two circular brushes 12 and 14 rotatable on upright axes. A driving motor 16 is provided with a vertical shaft the lower end 18 of which is disposed between the brushes, and may be provided with a smaller-diameter pulley, or as here illustrated, itself acts as a pulley surface. The peripheries of the backs 22 and 24 of the brushes 12 and 14 are employed as driven pulleys, and for this purpose, may be crowned, as indicated at 26, and provided with flanges 28 (Fig. 2). A belt 30 extends around the pulleys in a manner best shown in Fig. 4. It will be seen that the large difference in diameter between the driving pulley 18 and the brush pulleys 22 and 24, provides the desired speed reduction, and further, that the disposition of the belt provides

adequate friction despite the close disposition of the driving pulley to the driven pulleys, because the belt extends around the driving pulley for substantially 180°, and extends around the driven pulleys even further, for substantially 270°. The belt is preferably made of live rubber, thus further assuring adequate friction. The simple, cylindrical nature of the lower end 18 of the motor shaft permits the part of the belt extending around the motor shaft to self-adjustably align itself with the remainder of the belt carried on the pulley surfaces of the brushes.

It will be noted that the brushes are driven in the same direction. This may be taken advantage of to cause the machine to move by itself toward one side or the other when operating the machine. This will be clear from comparison of Figs. 5 and 6, with Figs. 7 and 8. In Figs. 5 and 6, the handle 32 has been raised somewhat from its normal position, thereby tilting the machine in the manner shown in Fig. 6, so that the brushes rest on their forward edges. It will be seen from inspection of Fig. 5, that with the brushes 12 and 14 rotating in the direction indicated by the arrows, the entire machine will move in the direction indicated by the arrow 34. It will be understood that the tilt has been exaggerated in Fig. 6 for the sake of clarity, and that only a slight tilt is needed to cause the action at the forward edges of the brushes to dominate over the action at the rear edges. It is not necessary that the rear edges actually be lifted from the floor, as shown in Fig. 6.

In Figs. 7 and 8, the handle 32 has been moved downwardly somewhat, thereby tilting the machine toward the rear edges of the brushes, and so causing the machine to move in the direction of the arrow 36 in Fig. 7.

For this type of operation, it is important that the handle be fixed in its angular relation to the machine. However, it is also desirable that the handle be movable to approximately vertical position for compact storage, and that it be movable to approximately horizontal position for use beneath furniture. Accordingly, the handle is preferably provided with releasable locking means, and the specific means here employed is best shown in Fig. 3, it comprising a dog 38 and a notched quadrant 40, said quadrant preferably having three notches 42, 44 and 46. The dog 38 is normally urged to locking position by means of the spring 48. It may be released at any time by stepping on a foot plate 50, said plate being carried by a horizontal pin 52 to which both the dog 38 and the plate 50 are keyed.

The quadrant 40 is secured to handle 32, and, in the specific form here illustrated, the quadrant acts as a mount for the handle. Specifically, the quadrant is formed integrally with an arm 54 (Fig. 3) the end of which has a split socket 56 into which the handle 32 is inserted, this being locked in position, as by means of a clamp screw 58. A conventional hollow handle may be used, with electric conductors 60 extending there-through and thence to the motor.

The electric cord may extend from the upper end of the handle in conventional fashion, and an appropriate switch may also be located on the handle near its upper end.

The quadrant 40 and arm 54 are pivotally mounted on the machine by means of a bearing pin 62 the ends of which are received in side walls 64 projecting rearwardly from the motor housing. These side walls may, if desired, be ornamentally finished, as indicated in Fig. 1, in

order to give the same an attractive, modern, streamlined appearance.

The three notches 42, 44 and 46 correspond to desired positions of the handle. In Fig. 3, the dog 38 is in notch 46 and holds the handle 32 in substantially upright position for compact storage of the machine. When the dog enters notch 44, the handle is disposed in the broken-line position 32', and this is the normal operating position for the handle. When the dog is disposed in notch 42, the handle is substantially horizontal, and this is useful for operating the machine beneath furniture.

The brushes 12 and 14 are mounted in a housing 66. This is preferably made of aluminum or equivalent light-weight metal. It is provided with an apron or peripheral flange 68 which surrounds the backs or upper parts of the brushes. This apron may, if desired, be provided with a rubber guard or bumper 70.

The brushes are freely rotatably carried on generally cylindrical studs 72, preferably made of steel, the upper ends of which are driven with a force fit into receptive holes formed in the relatively soft metal housing 66. These holes are made in bosses 74, and stiffening webs 76 may be provided between the bosses and the periphery of the housing. A flange 78 may be provided above the brush, and a washer 80 below the brush, and the brush may be detachably held on the stud 72 by means of a split ring 82 which is sprung into a groove formed in the lower end of the stud. Both brushes are carried in this way. The flanges 78 may be formed integrally with the studs, and limit the insertion of the studs. The brushes are preferably self-lubricating, and in the present case, carry graphite-impregnated bushings 84.

The machine is preferably provided with a balance weight 86 disposed within housing 66 and extending along its forward edge. The weight is preferably made of cast iron or similar dense or weighty material. It is held in position by screws 88 passing upwardly into bosses 90 formed on the under side of the housing 66. The weight is so dimensioned and located as to offset any unbalance caused by the mounting means for the handle and the handle when in upright position. Actually, the handle leans forwardly somewhat, as will be seen in Fig. 3, thereby reducing the amount of unbalance, but in any case, the object of the balance weight is to provide an over-all balance which will permit the machine to rest evenly on the brush bristles when stored away, in order not to deform the bristles out of desired true condition during long periods of storage and non-use.

The motor may be conventional, and requires no detailed description. The motor housing comprises a main upper part 92 and a lower part 94. The upper and lower parts are spaced apart somewhat by means of spacer lugs 96 (Figs. 1 and 2), thus providing a space for the admission of air for cooling the motor. The air cooling action is preferably increased by the use of a suitable fan 98 best shown in Fig. 2.

The housing 92 is preferably made of aluminum or like light-weight metal. The field magnet assembly, generally designated 126, including the conventional laminated iron parts, is held bodily in housing 92, as by means of screws 101. The brush housings 102 as well as the self-lubricating ball bearing 104 are also carried by housing 92. The lower ball bearing 106 which is also preferably of the self-lubricating type, is carried in the

lower plate or housing member 94. The motor assembly is secured to the brush housing 66, as by means of a suitable number of screws 108.

It is believed that the construction and method of operation, as well as the advantages of my improved floor polishing machine, will be apparent from the foregoing detailed description thereof. The machine is compact, light in weight, simple and economical to manufacture, and therefore may be sold at a low cost. All of these factors contribute to make the machine suitable for household use or similar light-duty operation. The machine is easy to move over the floor being polished, and may be moved under its own power toward one side or the other by slightly tilting the machine, all as has been described. The machine is devoid of gearing, and is self-lubricating, yet with no danger of dripping grease or oil onto the floor being polished. The machine rests directly on the brush bristles even when stored away, but because of the balance of the machine, there is no danger of the brushes being deformed out of desired true condition.

It will be apparent that while I have shown and described my invention in a preferred form, many changes and modifications may be made in the structure disclosed, without departing from the spirit of the invention as sought to be defined in the following claims.

I claim:

1. A floor polishing machine comprising a housing made of a light-weight material, one or more circular brushes beneath the housing and resting directly on the floor, said brushes constituting the sole means for supporting the machine on the floor, a motor above said housing for

driving said brushes, a handle connected to said housing, means for locking the handle in substantially upright position when storing away the machine, and a balance weight within the housing on the side opposite the handle, said balance weight being made of a heavy material and being so designed as to balance the machine when stored away in order to provide equal distribution of weight on the brush bristles so as not to deform the brush out of desired symmetry during non-use of the machine.

2. A floor polishing machine comprising a housing, a motor mounted thereabove, two circular brushes rotatably received in said housing, a handle extending from the machine and so mounted that the machine may be rocked about a line connecting the centers of the brushes so that the machine may be tilted by means of the handle toward the forward edges of the brushes or toward the rear edges of the brushes, the motor having an upright shaft the lower end of which is located between the brushes, with its axis substantially in the plane extending between the axes of the brushes, the peripheries of said brushes forming pulley surfaces, a single belt extending around said pulley surfaces and around a pulley surface on the lower end of the motor shaft, whereby the brushes are rotated in the same direction, and a balance weight secured to the housing, said handle being located on one side of the aforesaid plane, and said balance weight being located on the other side of said plane, and being so designed as to balance the machine in order to provide equal distribution of weight on the brushes.

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