June 21, 1960 O. L. ALLEN ET AL 2,941,222

ELECTRIC FLOOR POLISHERS

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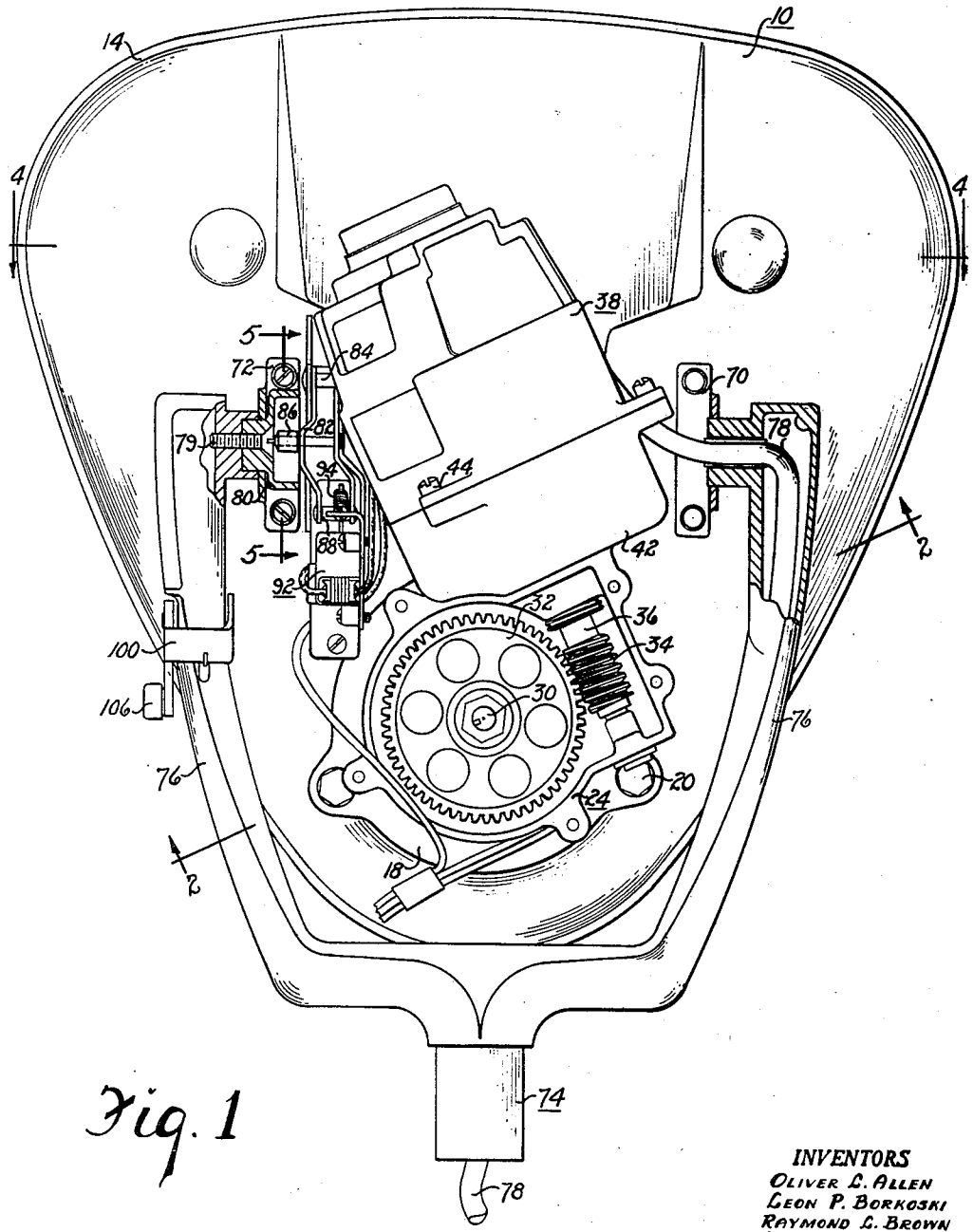


Fig. 1

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Fig. 2

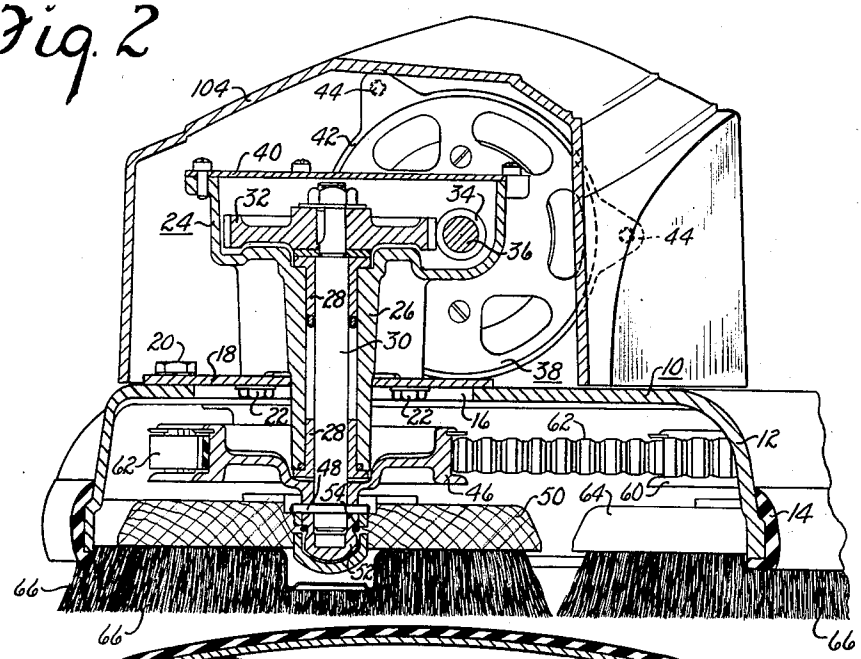
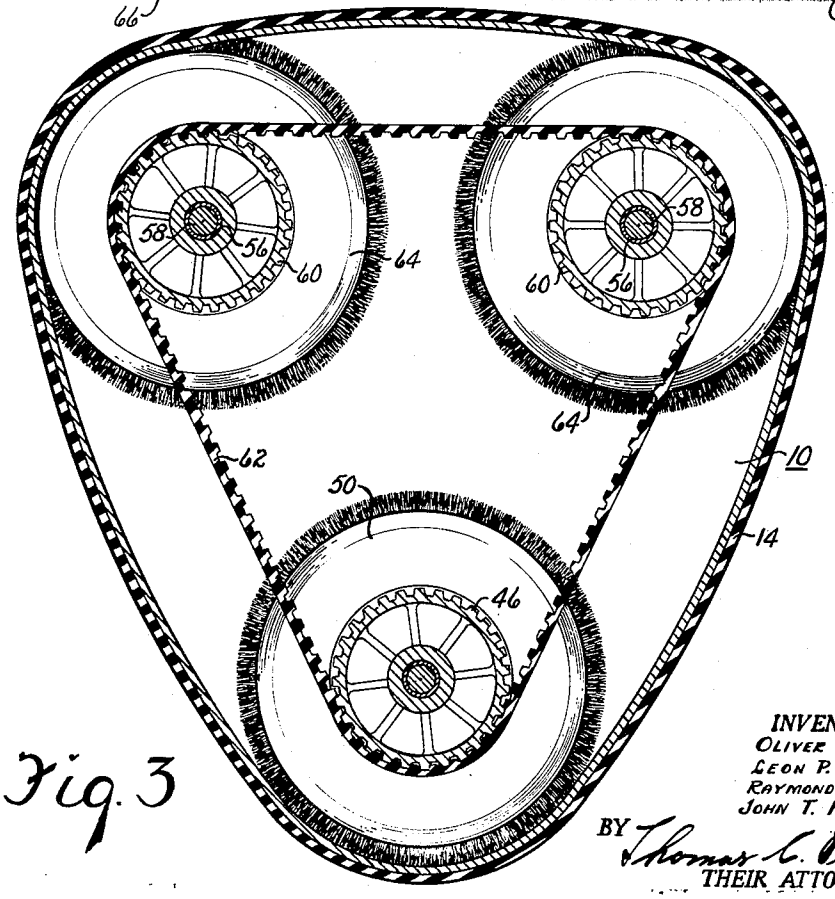


Fig. 3



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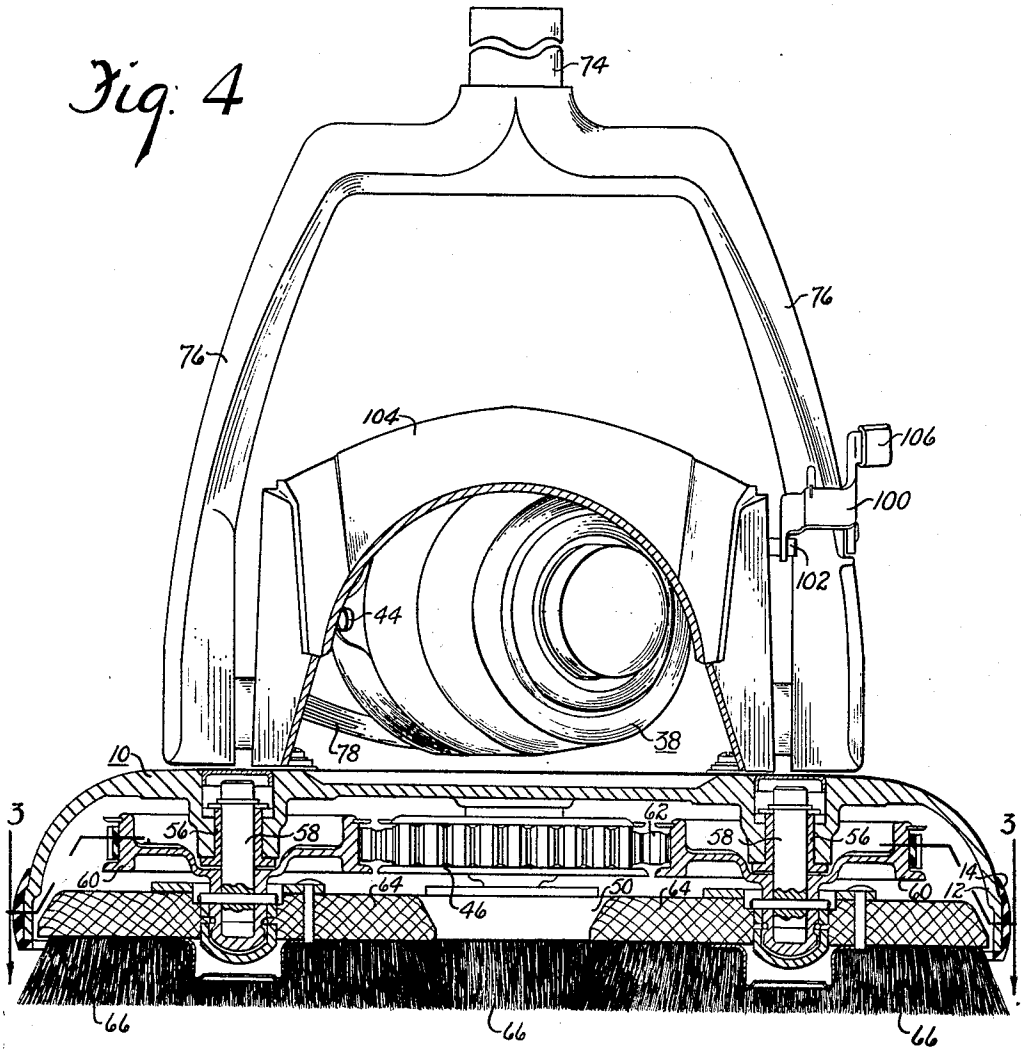
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Fig. 4



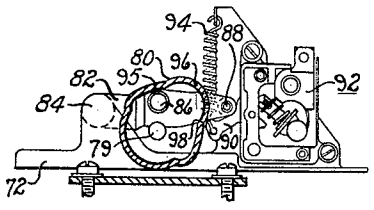


Fig. 5

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ELECTRIC FLOOR POLISHERS

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5 Claims. (Cl. 15—49)

Our invention relates to a motor driven multi-brush floor polisher and more particularly to an improved positive drive for the polishing members.

Heretofore, it has been common practice to either provide separate gear drives for the different polishing members, or to provide a single belt for driving all of them, which belt is driven by a pulley mounted directly on the motor shaft. The disadvantage of the first arrangement resides in the increased cost of separate gear drives, while with the second arrangement it has been impossible to prevent slippage of the belt when the polishing elements are subjected to a heavy load.

In accordance with our invention we provide a single gear drive to provide the necessary reduction in speed. This rotates directly one of the polishing members which is provided with a toothed sprocket wheel which drives a flexible endless transmission member, such as a chain or a timing belt which positively drives the other polishing member or members through a toothed sprocket wheel or wheels.

Further objects and advantages of our invention will be apparent from the following description when considered in connection with the accompanying drawings which form a part of the specification and of which:

Fig. 1 is a top view, partially in cross-section and with a hood member and gear case cover removed, of a floor polisher in accordance with our invention;

Fig. 2 is a cross-sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a cross-sectional view taken on the line 3—3 of Fig. 4;

Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 1; and

Fig. 5 is a cross-sectional view taken on the line 5—5 of Fig. 1.

Referring to the drawings, reference character 10 designates generally a triangularly shaped base member having a depending skirt portion 12, the lower edge of which carries a protection bumper 14. Near one of its apices the base member is formed with an opening 16. An apertured plate member 18 is secured to the base member over this opening by means of bolts 20, shown in Figs. 1 and 2.

Mounted on the plate 18 by means of bolts 22 is a gear case designated generally by reference character 24. This case includes a hollow elongated portion 26 which extends downwardly through the aperture in plate 18 and through the opening 16 so as to terminate below the base 10 and within the space defined by the skirt 12 thereof. A pair of sleeve bearings 28 is disposed within the portion 26 and rotatably support a drive shaft 30, the lower end of which protrudes beyond the end of portion 26 of the gear case.

A worm gear 32 is secured to the upper end of shaft 30 within the case and meshes with a worm 34 which is secured to the end of the armature shaft 36 of an electric motor designated generally by reference character

38. The upper end of the gear case 24 is closed by a removable cover 40.

The gear case 24 includes a portion 42 which also constitutes a bearing bracket of the motor 38, the motor frame being secured thereto by means of bolts 44. Thus, the motor is supported entirely from the gear case and no separate mounting on the base 10 is required.

A driving sprocket wheel 46 is secured to the protruding end of shaft 30 in any suitable manner, as by the pin 48. A circular brush 50, constituting a polishing member, may be removably secured to the hub portion 52 of the sprocket wheel as by means of a resilient snap ring 54 which engages an annular groove formed in the outer surface of the hub.

A pair of sleeve bearings 56 is mounted in the triangular base 10 adjacent to its other two apices. A stub shaft 58 is rotatably supported in each of the bearings 56 and each shaft has secured thereto a driven toothed sprocket wheel 60. As is shown more particularly in Fig. 3, a flexible endless transmission member 62 in the form of a toothed belt, commonly known as a timing belt, engages the sprocket wheels 46 and 60 so that the wheel 46 may drive the other two wheels. Polishing discs 64 are removably secured to the hubs of wheels 60 in the same manner as disc 50 is secured to the hub of wheel 46. As will be seen from Figs. 2 and 4, the bristles 66 of the polishing discs extend below the lower edge of the skirt portion 12 so as to contact the surface which is to be polished. The bristles are also flared somewhat so that their lower ends extend outwardly at least as far as the outer edge of the bumper 14 in order that they may polish right up to a baseboard.

Secured to the upper surface of the base 10 are handle brackets 70 and 72. A handle, designated generally by reference character 74 has a forked lower portion 76 which is rotatably connected to the brackets 70 and 72. An electric cord 78 for supplying current to the motor passes through the bracket 70 into one leg of the fork thence through the hollow handle portion.

Connected by means of a bolt 79 to the other leg of the fork adjacent to the bracket 72 is a switch actuating internal cam 80 having the contour shown in Fig. 5. A lever 82 is pivotally mounted at 84 on the handle bracket 72 and carries a cam follower 86. The other end of the lever 84 carries a switch actuating member 88 which cooperates with the arm 90 of a standard toggle switch designated generally by reference character 92. A spring 94 tends to maintain the arm 90 at all times in its uppermost position, which is the "on" position of the switch.

In Fig. 5 the cam is shown in the position which it occupies when the handle 74 is in the position shown in Fig. 1, namely extending substantially parallel to the floor. In this position the point 95 of the cam forces the cam follower 86 and the lever 82 downwardly, thus moving the switch arm 90 to its lower or "off" position. If the handle 74 is raised to its normal inclined position of use, the point 96 of the cam will be in contact with the cam follower 86, thus permitting spring 94 to pivot the switch arm 90 to its upper or "on" position, thus closing the circuit to the motor. If the handle is raised still further to the vertical position as shown in Fig. 4, the cam 80 is rotated until the point 98 thereof contacts the cam follower 86 which forces the lever 82 downwardly to the same position as shown in Fig. 5, thus throwing the switch to its "off" position. Hence, if the handle of the floor polisher is dropped to the floor or raised to its vertical position, which is the normal position for storage, the motor is automatically shut off, but the motor circuit is closed whenever the handle is in its normal inclined position of use.

One of the legs 76 of the fork is provided with a pivoted latch member 100 which engages a projection 102

formed on a hood member 104 when the handle is raised to its vertical position so as to retain the handle in this position. The latch is provided with a projecting arm 106 adapted to be pressed by the foot so as to pivot the latch out of engagement with the projection 102 when it is desired to lower the handle to its operative position. The hood 104 is provided to conceal the mechanism mounted on base 10 and to give the floor polisher a pleasing appearance.

It will be seen from the foregoing description that there is a positive drive from the motor 38 to the polishing members 50 and 64. A reduction in speed and hence a multiplication in torque is provided by the worm drive in the gear case 24. The polishing member 50 is driven directly from the driving sprocket 46 which is secured to the drive shaft 30 of the gear case. The sprocket 46 in turn positively drives the other two sprockets 60 by means of the timing belt 62. As is well known, this belt is provided with teeth which meshes with the teeth in the sprocket wheels so as to provide a positive drive which is entirely free from any possibility of slippage.

While we have shown one more or less specific embodiment of our invention it is to be understood that this has been done for the purpose of illustration only and that the scope of our invention is not to be limited thereby, but is to be determined from the appended claims.

What we claim is:

1. In a floor polisher, a base, an electric motor mounted above said base, a shaft extending vertically all the way through said base, toothed gearing disposed above said base for driving said shaft by said motor, a toothed sprocket wheel secured to said shaft below said base, polishing means disposed below said shaft and driven thereby, a plurality of stub shafts carried by said base and extending downwardly therefrom, a toothed sprocket wheel mounted on each of said stub shafts below said base, a flexible transmission member positively engaging all of said sprocket wheels, and polishing means disposed below each of said stub shafts and driven by the sprocket wheels mounted thereon.

2. In a floor polisher, a base, a gear case mounted on said base, an electric motor supported by said gear case with its armature shaft disposed parallel to said base and extending into said case, a worm on said shaft within said case, a bearing carried by said case, a drive shaft rotatably mounted in said bearing and extending downwardly through an opening in said base, a worm gear on said drive shaft within said case and meshing with said worm, a toothed sprocket wheel secured to said drive shaft below said base, a plurality of stub shafts carried by said base and extending downwardly therefrom, a toothed sprocket wheel mounted on each of said stub shafts, a flexible transmission member positively engaging all of said sprocket wheels, and polishing means disposed below and driven by each of said sprocket wheels.

3. In a floor polisher, a base formed with an opening therethrough, an apertured plate member secured to said base over said opening, a gear case mounted on said plate and having an elongated hollow portion extending through said aperture and said opening, an electric motor supported by said gear case with its armature shaft disposed parallel to said base and extending into said case, a worm on said shaft within said case, a drive shaft

journaled in said elongated position and protruding therefrom, a worm gear on said drive shaft within said case meshing with said worm, a toothed sprocket wheel secured to the protruding end of said drive shaft below said base, a plurality of stub shafts carried by said base and extending downwardly therefrom, a toothed sprocket wheel mounted on each of said stub shafts, a flexible transmission member positively engaging all of said sprocket wheels, and polishing means disposed below each of said stub shafts and driven by the sprocket wheels mounted thereon.

4. In a floor polisher, a triangular base formed with an opening therethrough adjacent to one of its apices, an apertured plate member secured to said base over said opening, a gear case mounted on said plate and having an elongated hollow portion extending through said aperture and said opening, an electric motor supported by said gear case with its armature shaft disposed parallel to said base and extending into said case, a worm on said shaft within said case, a drive shaft journaled in said elongated portion and protruding therefrom, a worm gear on said drive shaft within said case and meshing with said worm, a toothed sprocket wheel secured to the protruding end of said drive shaft below said base, a stub shaft carried by said triangular base adjacent to each of its other two apices and extending downwardly therefrom, a toothed sprocket wheel mounted on each of said stub shafts, a flexible endless transmission member positively engaging all of said sprocket wheels, and polishing means disposed below and driven by each of said sprocket wheels.

5. In a floor polisher, a triangular base formed with an opening therethrough adjacent to one of its apices, an apertured plate member secured to said base over said opening, a gear case mounted on said plate and having an elongated hollow portion extending through said aperture and said opening, an electric motor supported by said gear case with its armature shaft disposed parallel to said base and extending into said case, a worm on said shaft within said case, a drive shaft journaled in said elongated portion and protruding therefrom, a worm gear on said drive shaft within said case and meshing with said worm, a toothed sprocket wheel secured to the protruding end of said drive shaft below said base, a bearing mounted in said base adjacent to each of its other two apices, a stub shaft rotatably supported in each bearing and extending downwardly below said base, a toothed sprocket wheel mounted on each of said stub shafts, a flexible endless transmission member positively engaging all of said sprocket wheels, and polishing means disposed below and driven by each of said sprocket wheels.

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