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APPARATUS FOR OPERATING ON FLOORS

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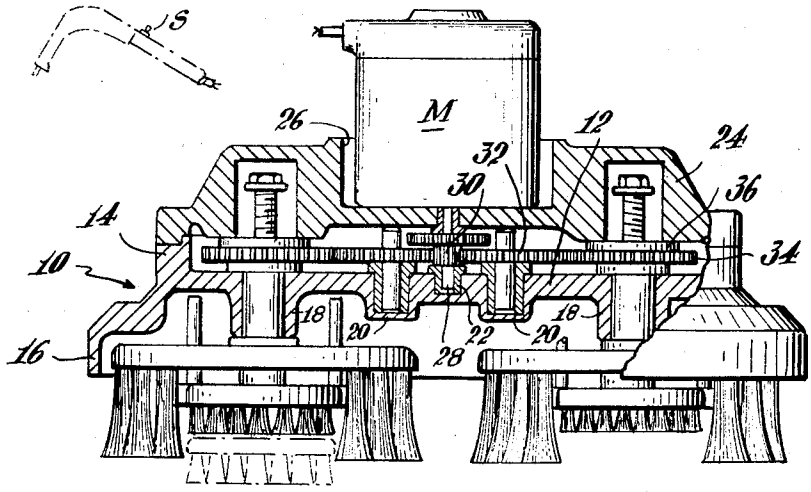

Fig. 1

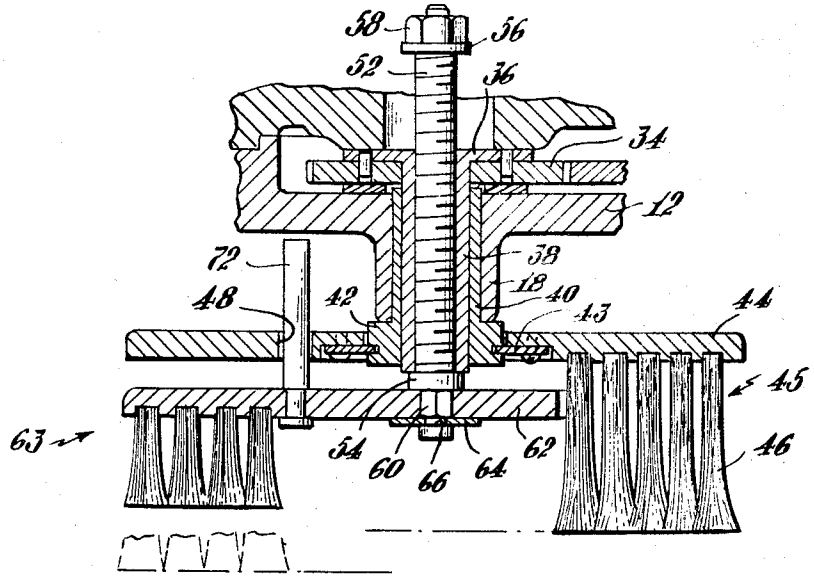

Fig. 2

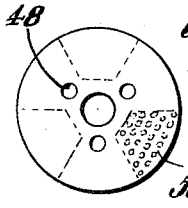

Fig. 3

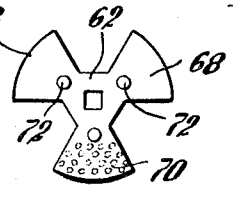

Fig. 4

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APPARATUS FOR OPERATING ON FLOORS

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9 Claims. (Cl. 15—49)

This invention relates to apparatus for treating floors and has for its principal objects to provide an apparatus for applying a dressing to the floor and thereafter polishing the same, to provide an apparatus in which the two operations may be performed without a change in implementation, to provide an apparatus for performing both operations which is no bulkier than apparatus heretofore provided for a single operation and which requires no substantial change in the construction and/or manufacturing costs and to provide apparatus which is efficient and durable.

As herein illustrated, the apparatus comprises means mounting a pair of brushes for optional use of either one independently of the other by axial movement of one relative to the other, so as to advance or retract the ends of its bristles relative to the ends of the bristles of the other brush. The aforesaid means includes concentrically disposed shafts upon which the respective brushes are mounted, so arranged that rotation of one relative to the other will effect an axial movement of the shafts and hence of the brushes into and out of operative position. There is means for effecting rotation of one of the shafts and means carried by the shafts engageable by such relative movement to impart rotation of the driven shaft to the other shaft. One of the brushes is fast to its shaft so as to be rotated therewith and to be moved bodily, axially with respect to the other shaft, and the other brush is loose on its shaft so as to be free to turn thereon, and there is means interconnecting two brushes so that rotation of one effects rotation of the other.

The invention will now be described in greater detail with reference to the accompanying drawings wherein:

Fig. 1 is a vertical diametrical section of the apparatus showing the applicators and the driving mechanism;

Fig. 2 is a fragmentary vertical section to larger scale taken at one side of the vertical center line of Fig. 1;

Fig. 3 is a plan view to much smaller scale of one of the applicators; and

Fig. 4 is a plan view of the other of the applicators.

Referring to Fig. 1, there is a rigid metal casting 10 having a wall 12, from the upper side of which rises a flange 14, and from the lower side of which extends a flange 16. In the wall there are bearings 18, 20 and 22. A cover 24 having a central depression 26 is adapted to be placed in engagement with the upwardly extending flange 14 and to be bolted thereto, to provide between it and the wall 12 a gear casing chamber. A motor M is mounted in the depression 26 in a vertical position with its shaft 28 extending downwardly through the bottom of the depression in the cover 24, into the gear chamber and is journaled at its lower end in the bearing 22. The shaft 28 has on it a pinion 30 which meshes with diametrically arranged gears 32 supported for rotation in the bearings 20. These gears in turn mesh with gears 34. Each gear 34 is fastened to a flange 36 at the upper end of a sleeve 38 which extends downwardly through one of the bearings 18 and through a sleeve 40

journaled in the bearing which at its lower end a flange 42. The flange 42 has a peripheral groove in it for receiving the inner edge of an annulus 43 fastened to the back 44 of a brush 45, so that the brush is free to turn relative to the flange 42. The brush back carries a plurality of bristles 46 which extend downwardly therefrom, and, as will be seen in Fig. 3, the bristles are arranged on the bottom side of the back in groups 50, spaced peripherally thereof, there being three such groups shown, each of which is sector-shaped. The back has in it three openings 48.

The sleeve 38 is internally threaded and a screw 52 is mounted therein so that relative rotation between the sleeve and screw will impart axial movement to the screw. At the lower end of the screw there is a collar 54 which effects rotation of the screw when the latter reaches the uppermost limit of its movement with the sleeve and at the upper end thereof there is a collar 56 and nut 58 which effects rotation of the screw when the latter reaches the lowermost limit of its movement with the sleeve. The lower end of the screw has a reduced neck 60, upon which is mounted the back 62 of a second brush 63, which is shown in Fig. 4, and is retained thereon by a latch 64 carried by the back which engages a groove 66 on the neck. The neck 66 is polygonal as is the hole in the back 62 so that the brush 63 turns with the screw. The back 62 is made up of three sectors 68 which carry groups of bristles 70 arranged to be interposed between the groups of bristles 50 of the brush 45. Three spindles 72 are adapted to be engaged with the holes 48 in the brush 45. Thus, rotation of the brush 63 will impart rotation to the brush 45 and at the same time the brushes will be permitted to move to and from each other.

When the screw 52 is in the uppermost position, as shown in Fig. 2, the brush 63 is held nested within the brush 45 with the lower end of its bristles in a plane above the plane of the lower ends of the bristles 46 of the brush 45 and hence out of contact with the surface upon which the bristles 46 rest. When the screw is moved to its lowermost position the ends of the bristles 70 of the brush 63 will extend downwardly beyond the plane of the ends of the bristles 46, as shown in Fig. 1, and will hold the bristles of the brush 45 out of contact with the surface upon which the bristles 70 rest.

The motor M is reversible and an appropriate switch S is provided for reversing the current therethrough so that it can be driven in either direction. Conveniently, a flip switch is provided on the handle employed to move the apparatus about, so that merely by flipping the switch one way or the other the motor may be driven in either direction.

With the machine resting on the floor with one of the brushes in contact therewith so that it is held stationary, rotation of the sleeve 38 in one direction will cause the screw to be raised and in the other direction to be lowered with respect to the sleeve. When the screw reaches the upper extreme position so that the collar 54 abuts the lower end of the sleeve a positive drive is established between them so that the brush 63 is driven directly by the sleeve and screw and the brush 45 is driven indirectly through the spindles 72. In the opposite direction when the screw reaches the lower extreme position so that the collar 56 abuts the upper end of the sleeve a positive drive is established between them so that the brush 63 is driven directly by the sleeve and the brush 45 is driven indirectly by means of the spindles 72. As previously pointed out, when the screw is in its uppermost position the brush 63 is elevated so that it is nested within the brush 45 and so that the ends of its bristles are raised to an inoperative position. While both brushes rotate in unison only the brush whose bristles have contact with

the floor will be operative. When the screw is moved to the opposite position the brush 63 is moved downwardly with respect to the brush 45, so that the ends of its bristles extend beyond the ends of the bristles of the brush 45 and support the apparatus with the ends of the bristles 46 elevated from the floor.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. Apparatus for operating on floors, comprising means mounting a pair of brushes for rotation in unison about a common axis, each brush having a working surface lying in a plane perpendicular to said axis, said mounting means being rotatable in either direction, means operably connected to the mounting means to effect rotation thereof in either direction, said mounting means having parts movable relative to each other in the direction of said axis to which the brushes are respectively fixed, and means whereby rotation of the mounting means in one direction effects axial movement of the parts, so as to displace the working surfaces of the brushes in one direction and by rotation in the opposite direction to displace the working surfaces of the brushes in the opposite direction.

2. Floor conditioning apparatus comprising means mounting a pair of brushes for rotation about a common axis, said means including a shaft operably connected to one of the brushes for effecting rotation thereof, said shaft being rotatable in one direction or the other, means connecting the one brush to the other brush so that the latter rotates in unison therewith, means whereby rotation of the shaft in one direction operates to advance the brush connected thereto beyond the other brush, and in the opposite direction to retract it, and a reversible motor operable to drive the shaft in either direction.

3. Floor conditioning apparatus comprising means mounting a pair of brushes for rotation about a common vertical axis, a shaft operably connected to one of the brushes to effect rotation thereof, said shaft being rotatable in one direction or the other, means connecting the other brush to the one brush for rotation therewith, means whereby rotation of said shaft in one direction operates to move one of the brushes in advance of the other and in the opposite direction to retract it and means selectively operable to turn the shaft in either direction.

4. Floor conditioning apparatus comprising means mounting a pair of brushes for rotation about a common axis including a drive shaft, means for effecting rotation of the drive shaft in either direction, a screw concentric with the drive shaft and having threaded engagement therewith, said screw being movable axially relative to the drive shaft by rotation of the drive shaft, one of the brushes being fastened to the screw so as to be movable with the screw in axial movement and in rotation and the other being mounted on the drive shaft and free to turn thereon, and means connecting the two brushes so that rotation of one effects rotation of the other.

5. Apparatus for conditioning floors comprising means mounting a pair of brushes for rotation about a common axis including a hollow drive shaft on which one of the brushes is mounted for rotation about the axis of the shaft, means for effecting rotation of the shaft in either direction, a screw threadably mounted within the drive shaft, said screw being movable axially within the drive shaft by relative rotation of the screw and shaft, said other brush being fastened to the screw for movement therewith axially and in rotation and means connecting the brushes so that rotation of one effects rotation of the other while permitting movement of the brushes to and from each other in a direction axially of the shaft.

6. Apparatus for treating floors comprising means mounting a pair of brushes for rotation about a common axis, said means including a hollow drive shaft on which one of the brushes is mounted for free rotation, means for effecting rotation of the shaft in either direction, a screw threaded within said hollow drive shaft, said screw being axially movable within the drive shaft by relative rotation of the drive shaft and screw, the other brush being fastened to the screw for movement axially and rotationally therewith, means connecting the two brushes so that rotation of one effects rotation of the other but permits movement of the brushes to and from each other, and means for limiting the axial movement of the screw relative to the shaft at each extremity of its movement, said means operating to impart rotational movement of the drive shaft to the screw.

7. Apparatus comprising means mounting a pair of brushes for rotation about a common axis including concentric shafts, one of which is a drive shaft and the other a screw threaded thereon, each brush having a rigid back from which project spaced groups of bristles, the two brush elements being arranged with the backs parallel to each other with the groups of bristles interdigitated, means connecting one of the brushes to the drive shaft so as to be free to turn thereon, means connecting the other brush to said screw to turn therewith, said screw being rotatable relative to the drive shaft to turn the brush carried by it and to move it bodily in an axial direction relative to the drive shaft, means for effecting rotation of the drive shaft in either direction, means carried by the screw and drive shaft engageable by relative movement of the screw and drive shaft to cause the two to turn in unison and means connecting the two brushes so that rotation of one effects rotation of the other without preventing the brushes from moving to and from each other.

8. Apparatus for operating on floors comprising means mounting a pair of brushes for rotation about a common axis, said means comprising concentrically disposed elements carrying respectively the two brushes, said elements being movable axially relative to each other by rotation of one relative to the other, means carried by one element engageable with the other element limiting axial movement of the elements relative to each other, said means positively connecting the two elements at their opposite extreme positions so that rotation imparted to one imparts a corresponding rotation of the other, means for effecting rotation of one of the elements in either direction, means fixing the brushes carried by one of the elements so that it rotates therewith and means connecting the brushes so that rotation of one rotates the other.

9. Apparatus for operating on floors comprising means mounting a pair of brushes for rotation about a common axis and movement axially relative to each other along said axis, comprising concentrically disposed elements carrying respectively the two brushes, said elements being movable axially relative to each other by rotation of one relative to the other, means for limiting the relative axial movement of one to the other, said means operating positively to connect the two elements for rotation in unison, one of said brushes being rotatable with one of said elements and means connecting the brushes so that rotation of one effects rotation of the other.

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