Jan. 27, 1959 C. BAREL 2,870,468

ROTARY CLEANING BRUSH ATTACHMENT FOR SUCTION CLEANING DEVICES

Filed Sept. 20, 1952 3 Sheets-Sheet 1

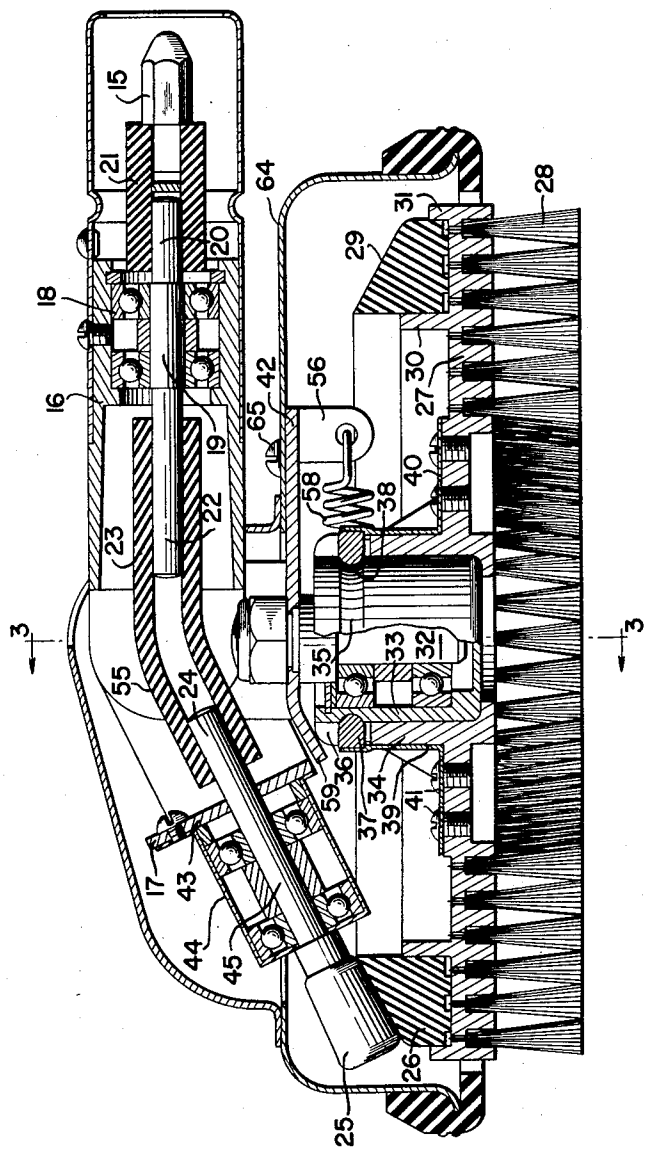

FIG.1

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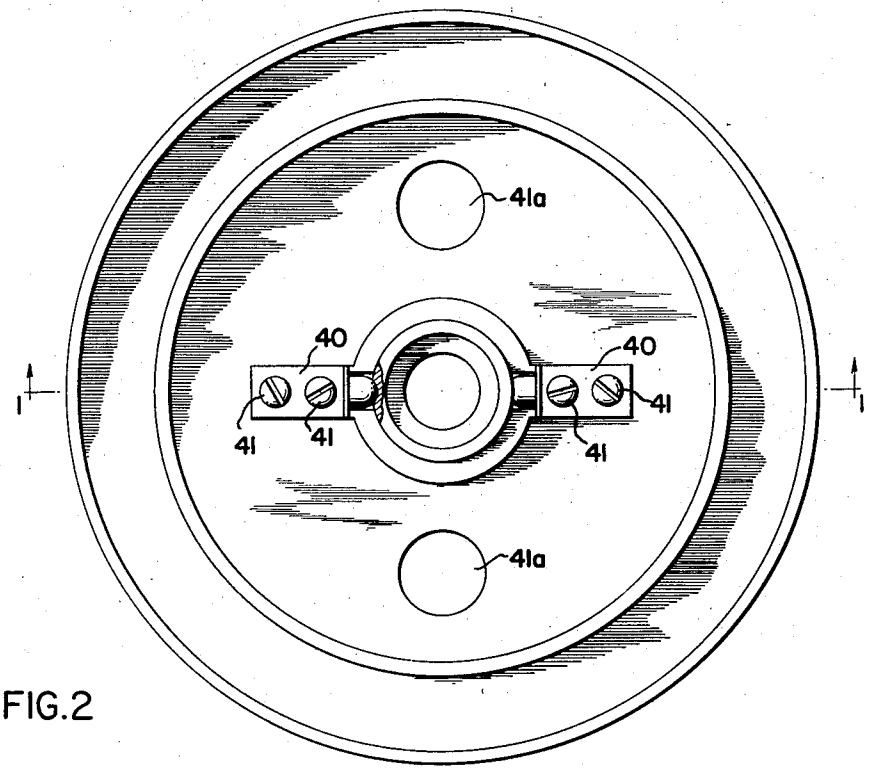

FIG.2

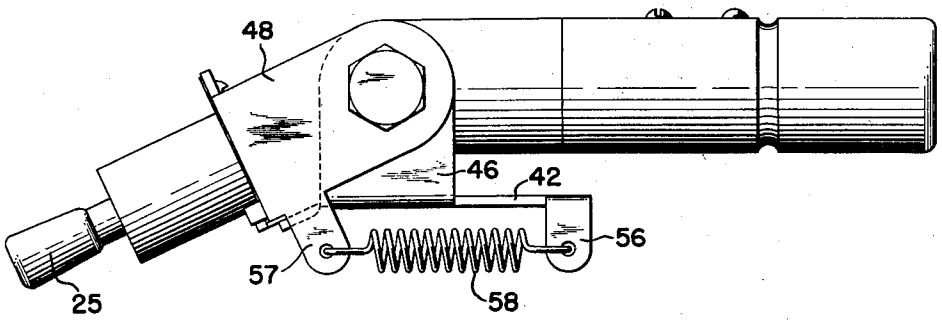

FIG.5

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ROTARY CLEANING BRUSH ATTACHMENT FOR SUCTION CLEANING DEVICES

Filed Sept. 20, 1952 3 Sheets-Sheet 3

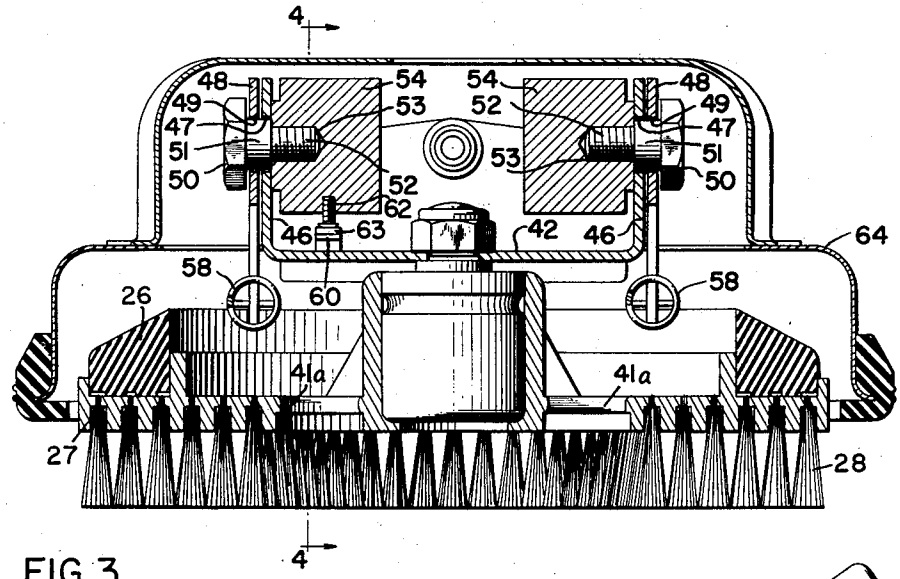

FIG. 3

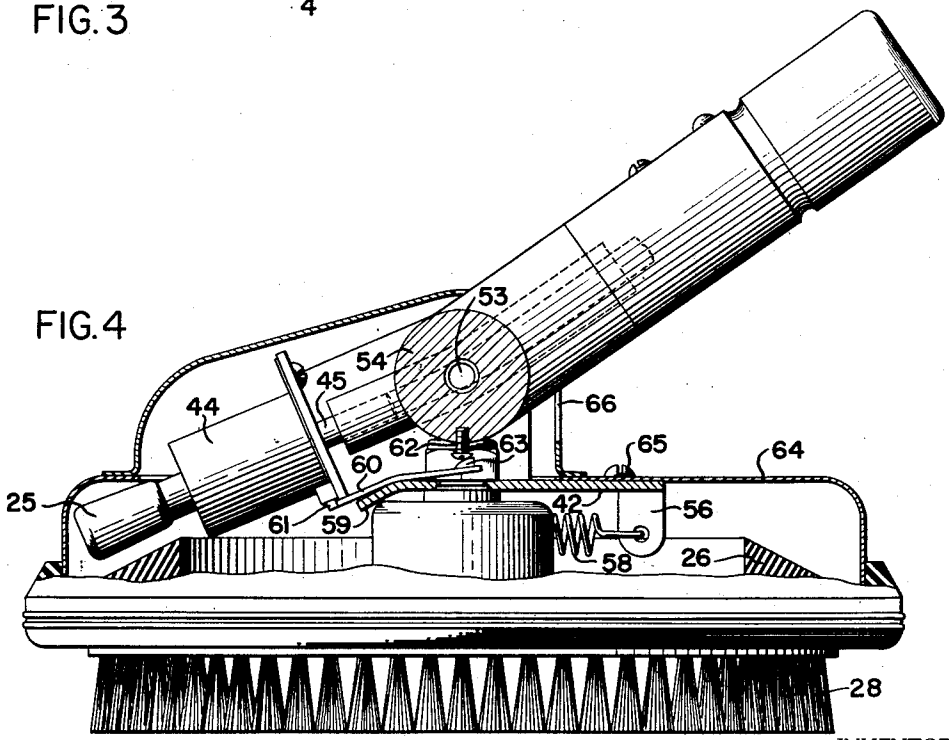

FIG. 4

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2,870,468

ROTARY CLEANING BRUSH ATTACHMENT FOR SUCTION CLEANING DEVICES

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3 Claims. (Cl. 15—49)

In the known suction cleaners, the motor is used primarily for a suction action or a blowing action. Consequently the possible uses of the known suction cleaners and attachments therefor are very limited.

The invention has for its object to provide an attachment for a suction type cleaner which has a greater number of possible uses than known attachments for suction cleaners and the invention is based on the view that the motor of the suction cleaner can also be used as a driving mechanism.

According to the invention, the motor provided in the suction cleaner can be used for driving all kinds of domestic appliances, such as grinding appliances, mixers, polishing machines, agitating devices and the like. Whereas the motor of the suction cleaner has hitherto only been used for extracting dust and is inoperative at other times, the motor can now serve many functions so that the suction cleaner motor is much more economical in use.

According to the invention, the motor of the suction cleaner is provided on the blower side with a shaft for driving a floor-polishing assembly.

It is clear that when such a floor-polishing assembly is coupled with the suction cleaner, the latter can also be used as a floor polisher. The suction side of the suction cleaner motor can at the same time be used for suction purposes.

Instead of the aforementioned floor-polishing assembly, it is also possible to couple a different type of mechanism with the suction cleaner. It is desirable that the mechanism which is to be driven should be coupled in a detachable manner so that it is then possible, for example, to replace a floor-polishing assembly by another mechanism.

Suction cleaners are known in which the motor is provided with a shaft for driving a mechanism, but this shaft is disposed on the suction side of the motor and serves to drive a rotatable brush which is provided in the suction nozzle of the suction cleaner. According to the invention, the brush unit is provided with a shaft which can be coupled with the driving mechanism. As the driving mechanism, the driving motor of the suction cleaner is employed.

The brush unit, which is the subject of the invention, has a comparatively low height due to the absence of the driving motor on the unit itself, whereby the unit can also reach low spaces.

The shaft of the brush unit according to the invention, which has to be coupled with the driving shaft of the driving mechanism, can be angular in cross-section. In order that this shaft can be coupled with the driving shaft of the driving mechanism, the latter shaft must have a correspondingly formed recess extending in the longitudinal direction. However, it is also possible to provide the shaft of the brush unit which has to be coupled with the driving shaft of the driving mechanism with a longitudinally extending recess of triangular or polygonal cross-section disposed coaxially of the shaft, the correspondingly shaped driving shaft of the driving mechanism fitting in said recess.

The shaft of the brush unit may be arranged in a sleeve which is pivoted to the frame of the brush unit. The sleeve may have arranged therein a ball bearing in which is mounted a shaft, one end of which is connected by means of an elastic coupling with the shaft which can be coupled with the driving mechanism, and the other end of which is coupled by means of an elastic coupling with the shaft of the driving roller for the friction plate of the brush unit.

Preferably the friction ring is arranged coaxially with the brush plate on the side thereof opposite to the bristles, while the brush plate can be mounted on a rotatable shaft disposed perpendicularly thereon.

Only one plate or disc is used in the construction according to the invention. It is obvious that the height of the brush unit is then relatively small, because the weight of the brush unit according to the invention is smaller than that of the known brush unit. A floor polisher with a brush unit according to the invention can therefore be more easily handled. One constructional example of the arrangement according to the invention is shown in the accompanying drawing, wherein:

Figure 1 is a cross-section through the brush unit on the line 1—1 of Figure 2 with parts removed for clarity;

Figure 2 is a plan view of the brush unit with the housing removed;

Figure 3 is a cross-section on the line 3—3 of Figure 1;

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

Figure 5 is a view of the mounting for the brush unit.

The brush unit shown in Figure 1 is provided with a shaft 15, the cross-section of which is angular and which can be coupled with the driving shaft of a driving mechanism, for example, an electric motor. The driving shaft of the driving mechanism is provided with a longitudinally extending recess which is disposed coaxially of this shaft and which in cross-section has a shape corresponding to the shaft 15 of the brush assembly. However, it is also possible for the shaft 15 to be provided with such a recess, while the driving shaft of the driving mechanism to be coupled therewith has such a shape that the driving shaft fits in the shaft of the brush unit. The cross-section of the shaft 15 can also be triangular. The shaft 15 is supported by a sleeve 16 which is pivotally connected with the adjacent member 17 of the brush assembly. Provided in the sleeve 16 is a ball bearing 18 which supports a shaft 19, the end 20 of which is coupled by means of an elastic coupling 21 with the shaft 15 and the other end 22 of which is connected by means of an elastic coupling 23 with the shaft 24 of the driving roller 25 in order to drive the friction plate or disc 26 of the brush unit. The coupling of the shaft 15 with the driving shaft of the driving mechanism is made easier by the elastic coupling 21. It is obvious that the height of the brush unit shown in the drawing is smaller than that of the known brush unit.

The brush unit shown in Figure 1 comprises a brush plate 27. Arranged coaxially with the brush plate 27 on the side opposite to the bristles 28 is the friction ring 29 consisting of hard rubber or similar material. The friction ring 29 is clamped between two flanges 30 and 31 disposed perpendicularly on the brush plate 27. This method of securing the friction ring 29 is known per se.

It is apparent from the drawing that the brush unit is comparatively low in height. This is possible since with the brush unit illustrated, only one plate or disc is employed and not, as in the known construction, two discs which are coupled with one another, one of which is a friction disc and the other a brush plate or disc. By using only one disc, the weight of the brush unit

according to the invention is smaller than that of the known brush unit. The bushing 33 is rotatable about the shaft 32. A bushing 34 of the brush disc 27 can be pushed on to the bushing 33 of the shaft 32. The bushings 33 and 34 can be coupled with one another. For this purpose, the bushing 33 is formed externally with an annular groove 35 which is arcuate in cross-section. However, this cross-section may also be of another curved form. The bushing 34 of the brush disc 27 is provided with two oppositely disposed slots 36. Located in each of the slots is a pin 37, the length of which is greater than the thickness of the wall of the bushing 34. A resilient pressure is exerted on the pins 37, said pressure being applied at right angles to the axis of the bushings 33 and 34. When the bushings 33 and 34 are interlocked, the ends of the pins 37 are in the annular groove 35 of the bushing 33. The ends 38 of the pins 37 are in cross-section curved to correspond to the annular grooves 35. The pins 37 are arranged on the free ends of elastic strips 39 which are on the outside of the bushing 34 and extend parallel to the axis of the bushing 34. Each elastic strip 39 has a bent-over portion 40 which is secured by screws 41 to the brush disc 27. The brush disc 27 is formed with openings 41*a* at both sides of the bushing 34. A finger can be brought into each of these openings, whereby the brush disc 27 can be gripped. By pulling on the brush disc 27, the pins 37 are lifted out of the annular grooves 35 of the bushing 33 against the action of the elastic strips 39. The bushing 34 of the brush disc 27 can then be pulled down off the bushing 33. If it is desired to fit the brush disc 27 on the bushing 33, again, the bushing 34 is pushed on to the bushing 33, the pins 37 being forced by the action of the elastic strips 39 into the annular grooves 35.

The coupling according to the invention can also be employed with brush units for floor-polishers or apparatus in which a friction disc and a brush disc cooperate with one another.

The frame of the coupling consists first of all of a U-shaped member having a base plate 42, and another plate 43. The plate 42 carries the shaft 32 about which the friction ring 26 is adapted to rotate. The plate 43 carries the mounting 44 for the shaft 45 of the driving roller 25. The plates 42 and 43 form with one another an angle equal to the angle enclosed by the shaft 32 about which the friction ring 26 is rotatable and the shaft 45 of the driving roller 25. The plates 42 and 43 can be turned relatively to one another. For this purpose, the plate 42 is provided on both sides with spaced parallel side members 46 having openings 47, while the plate 43 is provided on both sides with the members 48 having openings 49. The openings 47 and 49 are disposed coaxially with respect to one another. Disposed in each of the openings 47 and 49 is a pin constituted by a screw bolt 50 with a collar 51. Rotatable about the collars 51 of the screw bolt 50 are the members 46 and 48. The screw-threaded stem 52 of the screw bolt 50 fits in an opening 53 of a solid member 54, said opening also being screw-threaded. The member 54 forms a lower part of the sleeve 16 in which the driving shaft 19 is mounted, said shaft being coupled by means of the flexible coupling 55 with the shaft 45 of the driving roller 25. The plates 42 and 43 are connected resiliently with one another. For this purpose, the plate 42 is provided on both sides with a downwardly bent lip 56, while the members 48 of the plate 43 are each formed with a lip 57. Tension springs 58 are arranged on the lips 56 and 57. By means of these springs 58, the driving roller 25 is urged against the friction ring 26 during the driving operation. The plate 42 is provided on the edge facing the brush disc with a downwardly bent portion 59 which extends to below the bottom edge of the plate 43. When the brush disc 27 and the friction ring 26 are released the plate 43 is turned

with respect to the plate 42 by the action of the springs 58. This movement is limited by the bent-over portion 59. The driving roller 25 can be deflected away from the friction ring 26 by means of the strip 60, the end 61 of which is secured to the plate 43, while the member 54 is provided with a projection or follower 62 (a screw in the example illustrated), which co-operates with the cam surface of the free end 63 of the strip 60 that acts as a lever. For lifting the driving roller 25 away from the friction ring 26, the pipe 16 with the member 54 is lowered so that the projection 62 is urged against the cam 63 of the strip 60. Since the strip 60 bears on the plate 42, the end 61 of said strip is raised, whereby the plate 43 with the shaft of the driving roller 25 is displaced against the action of the springs 58.

In the position shown in Figure 4, the driving roller 25 is raised from the friction ring 26. In order to prevent the projection 62 from missing the free end 63 of the strip 60 with rotation of the tube 16 and the member 54, the member 46 of the plate 42 may be provided with a stop with which a cam on the member 54 can operate when the driving roller is raised from the friction ring 26, which cam and stop are not indicated in the drawing. Secured by means of a screw to the plate 42 is a cap 64 which is formed with an opening 66 for the passage of the tube 16 with the driving shaft 19.

While this invention has been described with particular reference to the specific form shown in the drawing, it is to be understood that such is not to be construed as imparting limitations upon the invention, which is best defined by the claims appended hereto.

I claim:

1. A rotary attachment for suction cleaners having a motor with a drive shaft extending from the air discharge side of the cleaner, said attachment comprising, in combination, a brush assembly having a frame, a driven shaft adapted to be driven by the shaft of said motor, a sleeve pivotally connected to said frame, a ball bearing assembly carried by said sleeve, a second shaft extending through said sleeve and supported in said bearing, a flexible coupling extending within one end of said sleeve and connecting one end of said second shaft with said driven shaft, a third shaft, a mounting for pivotally supporting said third shaft on said frame, a second flexible coupling connecting the opposite end of said second shaft with said third shaft, a driving roller supported on said third shaft, a rotary disc having a plurality of bristles rotatably supported upon said frame, resilient means biasing said disc into frictional engagement with said roller for rotating the disc by said roller, an elongated strip secured to said mounting for said third shaft, said sleeve being in rocking engagement with said strip, and means carried by said sleeve including a projection adapted to engage with said strip to disengage said roller from engagement with said rotary disc in response to pivotal movement of said sleeve relative to said frame.

2. A rotary attachment for a suction cleaner as set forth in claim 1, wherein said frame comprises a U-shaped member having a base plate and a pair of spaced parallel side plates, said rotary disc being rotatably supported upon said base plate, and said sleeve being supported upon said side plates for rotation about an axis substantially perpendicular to the axis of rotation of said rotary disc.

3. A rotary attachment for a suction cleaner as set forth in claim 2, wherein said base plate further comprises a first pair of lips extending in a direction away from said side plates, said mounting for said third shaft having a depending second pair of lips spaced from said first pair of lips, and said resilient means comprising a pair of tension springs each secured at opposite ends between single ones of said first and second pairs of lips

urging said driving roller into frictional driving engagement with said rotary disc.

References Cited in the file of this patent

UNITED STATES PATENTS

1,156,235	Kirby	Oct. 12, 1915
1,797,119	Beckwith	Mar. 19, 1931
1,854,214	Moorhead	Apr. 9, 1932
1,954,066	Buck	Apr. 10, 1934
2,113,475	Faber	Apr. 5, 1938
2,257,339	Imhoff	Sept. 30, 1941
2,347,919	Lofgren	May 2, 1944
2,487,470	Osborn	Nov. 8, 1949

FOREIGN PATENTS

6,116	Austria	Dec. 10, 1901
24,668	Denmark	June 23, 1919
280,118	Great Britain	Nov. 10, 1927
373,444	Germany	Apr. 12, 1923
379,829	Great Britain	Sept. 8, 1932