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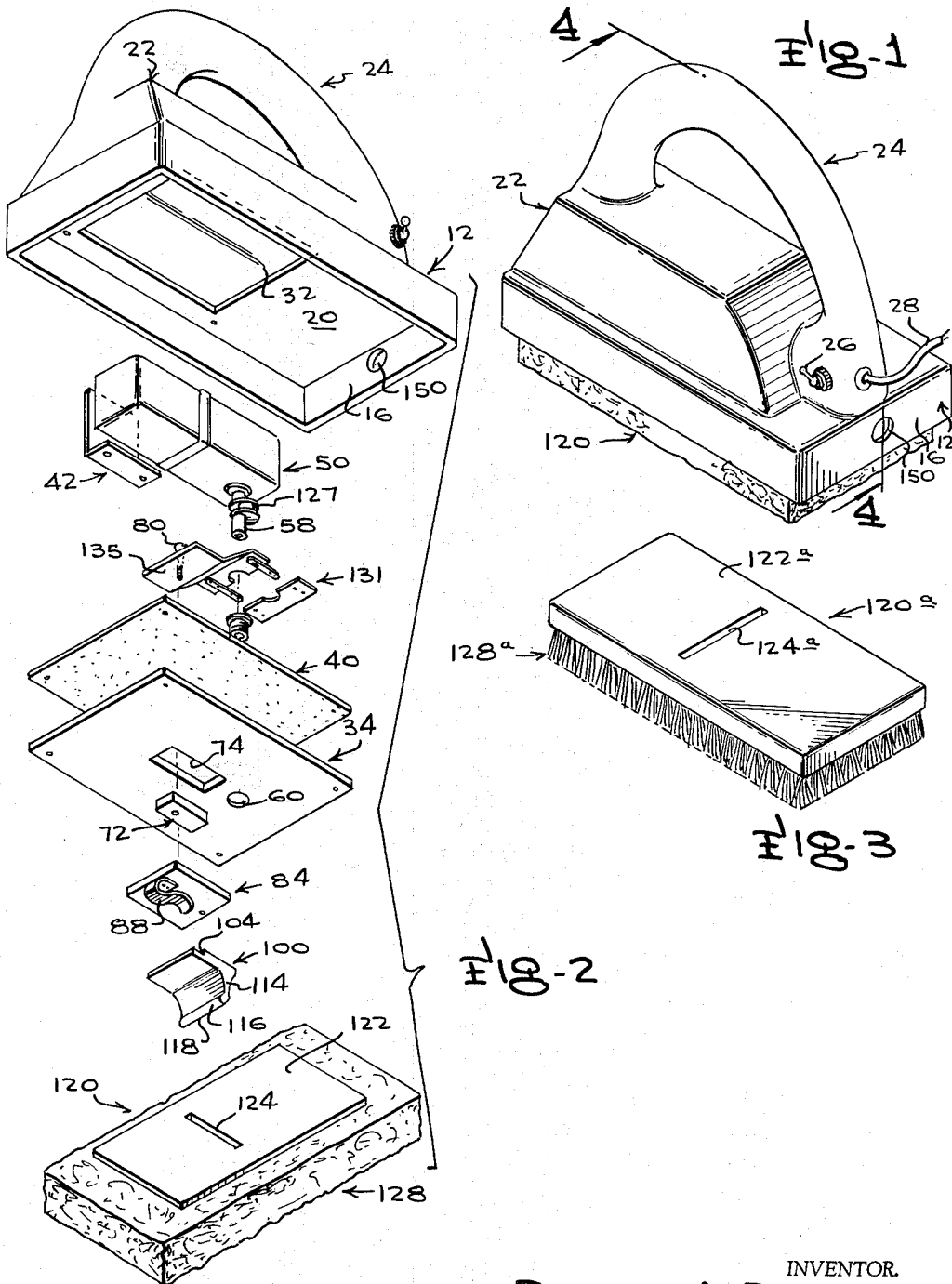
P. A. REED

3,231,917

RECIPROCATING WET CLEANERS AND POLISHERS

Filed Sept. 13, 1963

3 Sheets-Sheet 1



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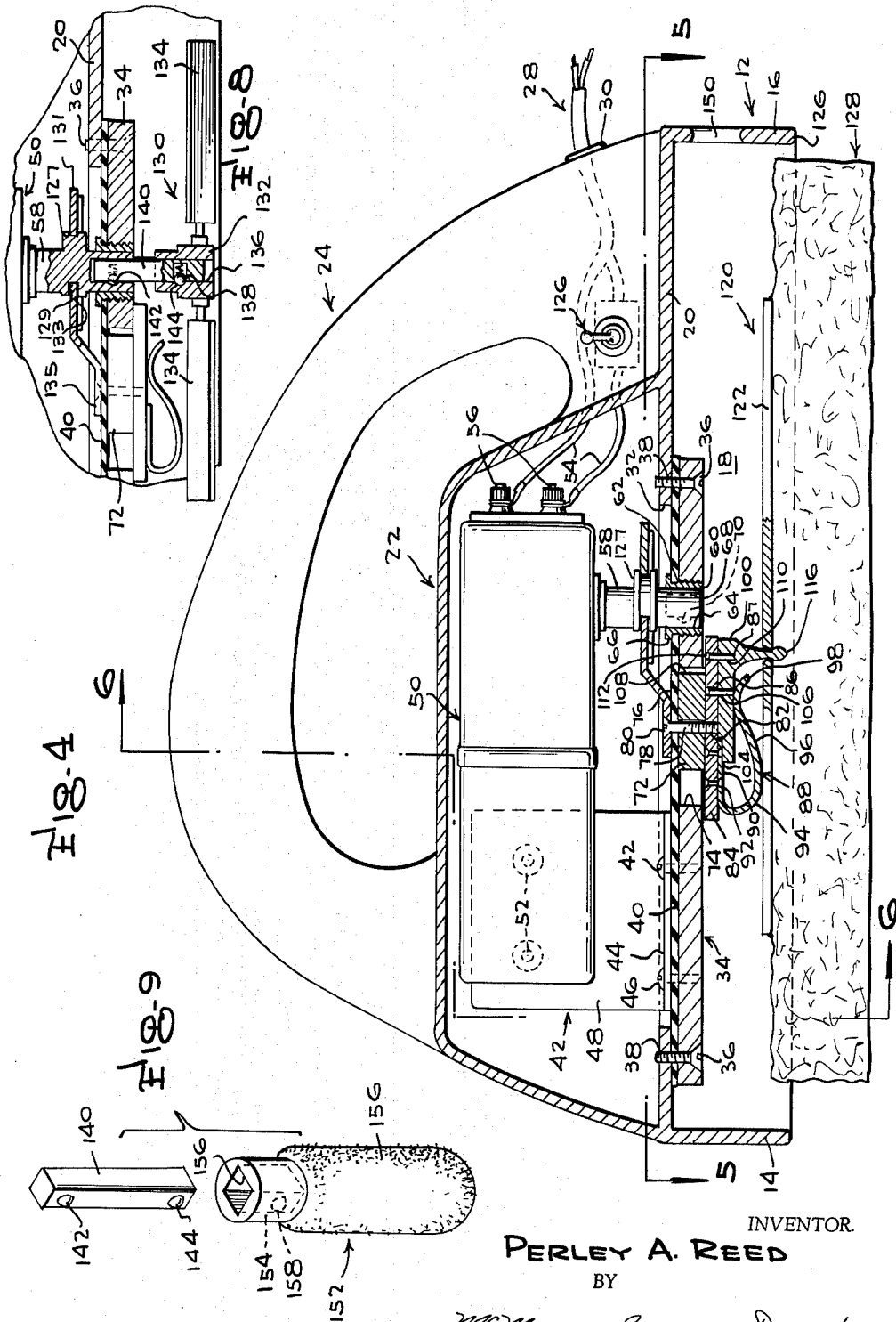
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3 Sheets-Sheet 3

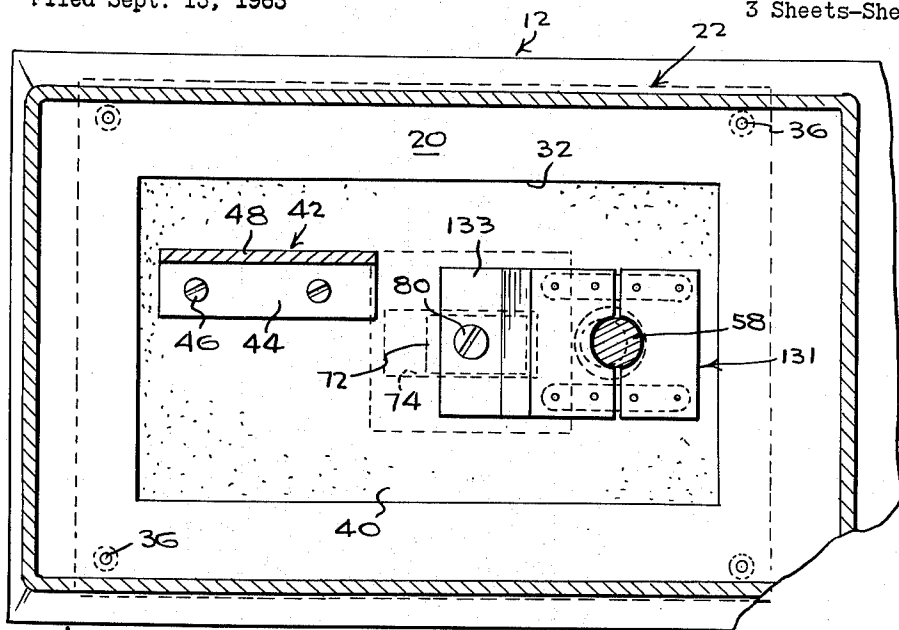


Fig-5

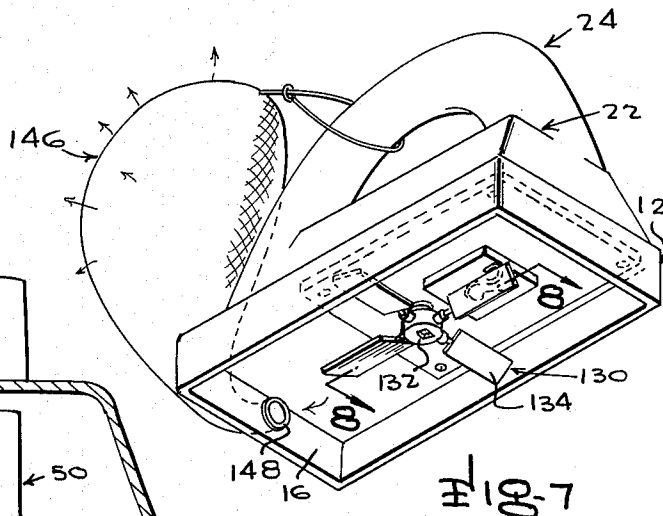
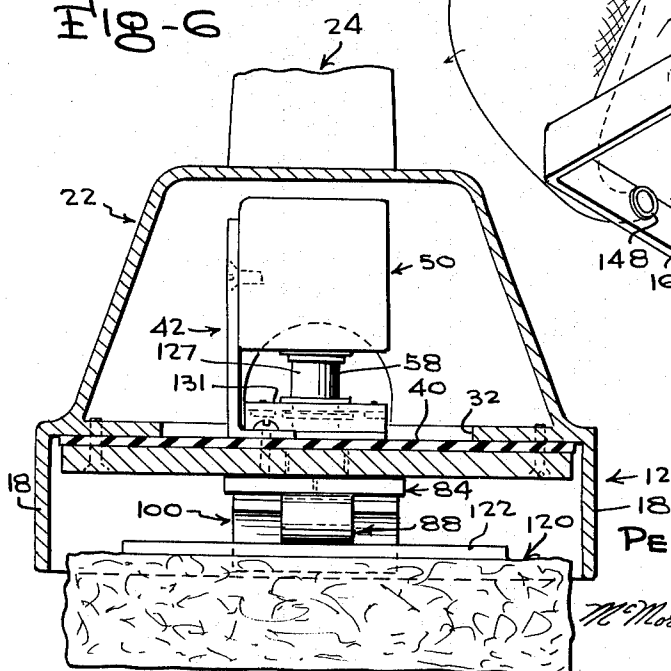


Fig-6

Fig-7



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3,231,917 RECIPROCATING WET CLEANERS AND POLISHERS

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4 Claims. (Cl. 15-98)

This invention relates to novel reciprocating wet cleaners and polishers for use in the wet-cleaning and polishing of surfaces.

The primary object of the invention is the provision of efficient, easily used devices of the kind indicated, whose use, in domestic, commercial and industrial operations, greatly reduces the labor, time, and effort otherwise involved in manual wet-cleaning of surfaces.

Another object of the invention is the provision of inexpensive but rugged devices of the character indicated above which are of simple construction, which are composed of a small number of uncomplex and easily assembled parts, and wherein the reciprocating cleaning elements thereof are adapted to be quickly and easily changed, without the use of tools, and without dismantling the devices, whenever deemed necessary or desirable.

A further object of the invention is the provision of versatile devices of the character indicated above, wherein the forms and materials of the reciprocating elements are determined by the character of the work to be done, and are easily and quickly interchangeable, for such operations as cleaning painted and unpainted surfaces, woodwork, flat or contoured, plaster and similar surfaces such as walls and ceilings, wallpaper, concrete areas such as garage and basement floors, and with a light steel bristle brush, the removal of rust and scale from metal surfaces. With an abrasive sheet attached to a sponge-like backing the device is applicable to contoured surfaces, and with a wax applicator to waxing and polishing surfaces, including shoes.

A still further object of the invention is the provision of a handle-mounted cleaning tool having a reciprocating cleaning element.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, specific forms of the invention are set forth in detail.

In the drawings:

FIGURE 1 is a rear perspective view of a device of the present invention;

FIGURE 2 is an exploded perspective view of FIGURE 1;

FIGURE 3 is a perspective view of a reciprocating brush, adapted to be substituted for the sponge of FIGURE 1;

FIGURE 4 is an enlarged vertical longitudinal section taken on the line 4-4 of FIGURE 1;

FIGURE 5 is a horizontal section taken on the line 5-5 of FIGURE 4;

FIGURE 6 is a vertical transverse section taken on the line 6-6 of FIGURE 4;

FIGURE 7 is a bottom perspective view, on a reduced scale, showing a reversible fan attachment installed on the device;

FIGURE 8 is an enlarged fragmentary vertical longitudinal section taken on the line 8-8 of FIGURE 7;

FIGURE 9 is an exploded perspective view of a rotary brush attachment and its connecting member.

Referring in detail to the drawings, the illustrated device comprises a longitudinally elongated, preferably rectangular, inverted pan-shaped housing 12 having front and rear walls 14 and 16, and side walls 18, respectively, and a flat top wall 20. A longitudinally elongated hollow motor

casing 22, which is narrower and shorter than the housing 12, is fixed to and rises from the top wall 20, the casing 22 being centered on the top wall 20 and spaced forwardly from the rear wall 16 of the housing. A centered longitudinally disposed upwardly bowed hollow handle 24 is fixed, at its forward end, upon the forepart of the motor casing 22, and at its rear end, to the housing top wall 20. A motor operating toggle switch 26 is installed in one side of the rear part of the handle 24, and an electrical convenience cord 28 extends through a grommet 30 in the lower rear surface of the handle and is connected to the switch 26 and extends into the motor casing 22.

The forepart of the housing top wall 20 is formed with a centered longitudinally elongated rectangular opening 32, which is registered with and is smaller in area than the motor casing 22. The opening 32 is closed by a longitudinally elongated rectangular base plate 34, disposed at the underside of the base plate, by means of screws 36 extending upwardly through the base plate, at its corners and threaded upwardly, as indicated at 38, into the housing top wall 20. A resilient and stretchable sealing gasket 40 is interposed, under compression, between the upper surface of the base plate 34 and the undersurface of the housing top wall 20, so as to preclude the entry of moisture from the housing 12 into the motor casing 22.

A longitudinally disposed upright bracket 42, offset to one side of the longitudinal centerline of the base plate 34, has a lateral foot portion 44 which rests upon the forepart of the gasket 40 and is fixed to the base plate 34, as by means of screws 46; and a perpendicular standard portion 48. A horizontally elongated electric motor 50 has its forepart fixed to the laterally inward side of the standard portion 48 of the bracket 42, as by means of screws 52. Wires 54 of the convenience cord 28 are severally secured to binding posts 56, on the rear end of the motor 50.

The rear part of the motor 50 has a perpendicular, downwardly extending rotary shaft 58, which extends through a tubular bearing 60, which is threaded downwardly through openings 62 and 64, provided in the rear part of the gasket 40 and the base plate 34, respectively. The bearing 60 has a lateral flange 66, on its upper end, which compressibly bears upon the gasket 40 to provide a moisture seal for the openings 62 and 64. The motor shaft 58 is provided, in its lower end, with a polygonal socket 68, formed in one side thereof, with a detent recess 70, for a purpose hereinafter disclosed.

A forwardly and rearwardly reciprocating slide 72 works in a longitudinally elongated slot 74, formed in the base plate 34, between the bracket 42 and the bearing 60, and has its upper surface 76, in sliding contact with the underside of the gasket 40. The slide 72 is formed with a vertical bore 78, positioned slightly forwardly of its midlength point, through which a screw 80 extends downwardly, and is threaded, as indicated at 82 into the center of a carrier plate 84, which is longer and wider than the slot 74 in the base plate 34, and is slidably engaged with the undersurface of the base plate.

The carrier plate 84 is, as shown in FIGURE 2 of rectangular shape, and is formed in its rear part, with a pair of centered, longitudinal spaced vertical pin-accepting bores 86 and 87. A generally J-shaped, reclining leaf spring 88 has a flat forward portion 90 fixed to the underside of the forepart of the carrier plate 84, at a point spaced forwardly from and in line with the bores 86 and 87, as by means of rivets 92. From the portion 90 the spring 88 curves downwardly and rearwardly, as indicated at 94, into an elongated, downwardly bowed arm 96, which has an upwardly bowed terminal 98 on its rear end, which is biased upwardly against the undersurface of the carrier plate 84, at the lower end of the forward bore 86.

The spring 88 serves as the retainer for a quick-detachable reciprocable connector 100, which comprises a rectangular flat plate which is transversely kerfed, at its forward end, as indicated at 104, to receive and abut the rear part of the spring portion 90, with the upper surface of the plate 102 engaged with the undersurface of the carrier plate 84 therebehind. The connector plate 102 is formed with a bore 106 which is registered with the forward bore 86 in the carrier plate 84, and is adapted to receive a forward pin 108, inserted in these bores and held up in place by the terminal 98 of the spring 88. Spaced behind the bore 106 the connector plate 102 is formed, in its upper surface, with a socket 110, which is registered with the rear bore 87, of the carrier plate 84, which receive a rear pin 112. The pins 108 and 112 and the spring 88 securely connect the connector 100 to the carrier plate 84, but enable quickly and easily disconnecting the connector 100, simply by pulling the connector 100 downwardly, against the resistance of the spring 88. The connector plate 102 is formed, at its rear end with a transversely elongated, downwardly extending downwardly tapering connector lug 114, which has an enlarged cross section retaining bead 116 extending along its lower edge and extending from opposite sides thereof, and having a pointed bottom edge 118.

A sponge type cleaning head 120 comprises longitudinally elongated rectangular rigid backing plate 122, formed with a transversely elongated slot 124, located intermediate its ends, which is slightly narrower than the cross section of the retaining bead 116 of the connector 100. The backing plate 122 is adapted to be removably installed on the connector 100 by forcing the slot 124 up over the retaining bead 116, so that the sides of the bead bear upwardly against the underside of the backing plate 122, at opposite sides of the slot 124, as shown in FIGURE 4.

The backing plate 122, as shown in FIGURE 4, is positioned on a level slightly above the lower edge 126 of the housing 20, and has centrally secured, in suitable manner, to its undersurface, a longitudinally elongated rectangular sponge 128, which extends a substantial distance below the lower edge 126. The sponge 128 extends beyond the sides and the ends of the backing plate 122.

An alternate brush type of cleaning head 120a, shown in FIGURE 3, comprises a longitudinally elongated rectangular inverted pan-shaped backing 122a, provided, in its top wall with a transverse slot 124a for acceptance of the retaining bead 116 of the connector 100. Suitably secured within and extending downwardly from the backing 122a are brush bristles 128a.

The assembly of slide 72, carrier plate 84, connector 100, and cleaning head 120 or 120a, is reciprocally connected to the motor shaft 58. The motor shaft 58 has thereon an eccentric cam 127 formed with a peripheral groove 129. An elongated cam follower 131 has a circular opening 133, in its rear portion, whose edge is confined in the cam groove 129. The forepart 135 of the cam follower is downwardly offset, the forepart 135 rocking about the slide screw 80.

In use and operation, the device is held by the handle, with the cleaning head 120 or 120a against or near to the surface to be wet-cleaned, cleaning material having been applied to this surface or to the head. The switch 26 is then closed, to operate the motor 50, and reciprocate the cleaning head, which is then applied to the surface to be cleaned.

An alternative blower function for the device is shown in FIGURES 7 and 8, wherein the connector 100 is removed from the carrier plate 84, and a reversible fan 130 is removably and supportably connected to the motor shaft 58. The fan 130 comprises a hub 132 from which pitched radial fan blades 134 extend. The hub 132, as shown in FIGURE 8, is formed with an axial polygonal bore 136 extending therethrough having a detent recess 138 in a side thereof. A polygonal connecting shaft 140,

which removably fits the motor shaft socket 68 and the hub bore 136 has spaced laterally spring-pressed detent balls 142 and 144, on a side thereof, which are adapted to engage in the detent recess 138 of the fan hub bore 136 and in the detent recess 70 of the motor shaft socket 68. The fan 130 is adapted to be connected to the connecting shaft 140 with its blades 134 facing downwardly in the direction of rotation of the fan for an air blowing drying action upon a wet surface.

For a suction drying operation, the fan 130 is reversed on the connecting shaft 140 with its blades 134 facing upwardly in the direction of rotation of the fan, the device then being fitted with a flexible receptacle bag 146 whose open neck 148 is securably engaged through an opening 150 provided in the rear end wall 16 of the housing 20.

Another alternative cleaning function of the device can involve a cylindrical rotary brush 152, shown in FIGURE 9, which comprises a head 154 formed, in its upper end, with a polygonal socket 156, for receiving the connecting shaft 140, and provided, in one side thereof, with a ball detent recess 158, for receiving one of the ball detents on the shaft 140, whereby the head 156 can be removably connected to the motor shaft 58. The brush 152 has a cylinder 156 of bristles below its head 154. The bristle cylinder 156 can be given any shape or contour dictated by the character of the cleaning or polishing tasks it is designed to perform.

Although there have been shown and described preferred forms of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claims appended hereto.

What is claimed is:

1. A device of the character described comprising an inverted pan-shaped housing having opposed side walls, opposed end walls, and a top wall, said top wall being formed with a longitudinal opening, a base plate wider and longer than said opening, said base plate being secured to the underside of the top wall and closing said opening, a moisture sealing gasket interposed between the upper surface of the base plate and the underside of the housing top wall, a motor supported above the base plate and having a downwardly extending rotary shaft, said base plate being traversed by a tubular bearing through which the shaft extends, said motor shaft having an eccentric cam thereon, a cam follower having an opening operatively receiving the cam, said base plate being formed with a slot, a slide reciprocable in the slot and pivotally connected to the cam follower, a cleaning head positioned spacedly within the housing and extending therebelow, and means mounting the cleaning head to the slide.

2. A device of the character described, comprising an inverted pan-shaped housing having opposed side walls, opposed end walls, and a top wall, a motor supported above the top wall, said motor having a downwardly extending rotary shaft, said top wall being traversed by a tubular bearing through which the motor shaft extends, said motor shaft having an eccentric cam thereon, a cam follower operatively engaged with the cam, said housing top wall being formed with a slot, a slide reciprocable in the slot and pivotally connected to the cam follower, a cleaning head spaced within the housing and extending therebelow, and means mounting the head to the slide, said cleaning head comprising a backing formed with a transverse slot, said means comprising a connector secured to the slide and having a downwardly extending transverse connecting lug having a bead along its lower end, said bead being larger in cross section than the slot of the backing of the cleaning head and engaged through the slot beneath the backing.

3. A device of the character described, comprising an inverted pan-shaped housing having opposed side walls,

5

opposed end walls, and a top wall, said top wall being formed with a longitudinal opening, a base plate wider and longer than said opening, said base plate being secured to the underside of the top wall and closing said opening, a moisture sealing gasket interposed between the upper surface of the base plate and the underside of the housing top wall, a motor supported above the base plate and having a downwardly extending rotary shaft, said base plate being traversed by a tubular bearing through which the shaft extends, said motor shaft having an eccentric cam thereon, a cam follower having an opening operatively receiving the cam, said base plate being formed with a slot, a slide reciprocable in the slot and pivotally connected to the cam follower, a cleaning head positioned spacedly within the housing and extending therebelow, and means mounting the cleaning head to the slide, said cleaning head comprising a backing formed with a transverse slot, said means comprising a connector secured to the slide and having a downwardly extending transverse connecting lug having a bead along its lower end, said bead being larger in cross section than the slot of the backing of the cleaning head and engaged through the slot beneath the backing.

4. A device of the character described comprising an inverted pan-shaped housing having opposed side walls, opposed end walls, and a top wall, said top wall being formed with a longitudinal opening, a base plate wider and longer than said opening, said base plate being secured to the underside of the top wall and closing said opening, a moisture sealing gasket interposed between the upper surface of the base plate and the underside of the housing top wall, a motor supported above the base plate and having a downwardly extending rotary shaft, said base plate being traversed by a tubular bearing through which the shaft extends, said motor shaft having an eccentric cam thereon, a cam follower having an opening operatively receiving the cam, said base plate being formed with a slot, a slide reciprocable in the slot and pivotally connected to the cam follower, a cleaning head positioned spacedly within the housing and extend-

6

ing therebelow, and means mounting the cleaning head to the slide, said cleaning head comprising a backing formed with a transverse slot, said means comprising a connector secured to the slide and having a downwardly extending transverse connecting lug having a bead along its lower end, said bead being larger in cross section than the slot of the backing of the cleaning head and engaged through the slot beneath the backing, said means further comprising a carrier plate secured to the underside of the slide, said carrier plate being formed with spaced first and second bores extending therethrough, a leaf spring connected to the carrier plate and having an upwardly biased arm extending along the underside of the carrier plate, said arm having a terminal bearing upwardly against the underside of the carrier plate at the lower end of the first bore, said connector comprising a plate engaged with the underside of the carrier plate, said connector plate having a vertical bore extending therethrough registered with the first bore of the carrier plate, said connector plate having a socket opening to its upper surface and registered with the second bore of the carrier plate, and first and second pins removably and severally engaged in the registered bores and the socket, the spring terminal being retainable against the lower end of the first pin.

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