

April 21, 1942.

I. J. OWEN

2,280,077

MACHINE FOR CLEANING AND TREATING FLOORS

Filed Oct. 29, 1940

3 Sheets-Sheet 2

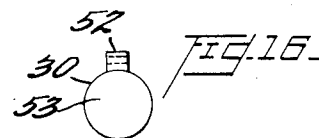
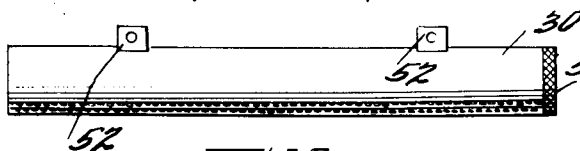
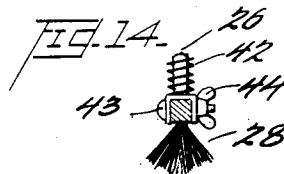
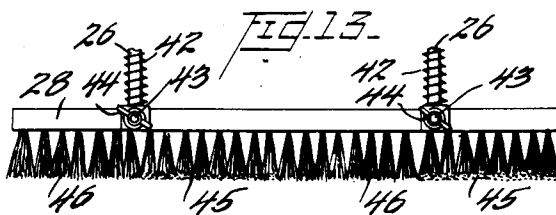
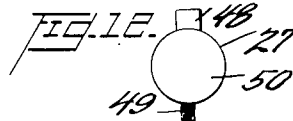
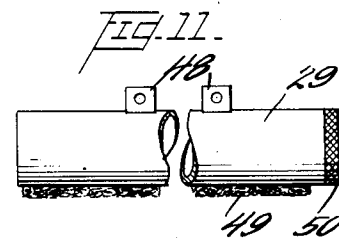
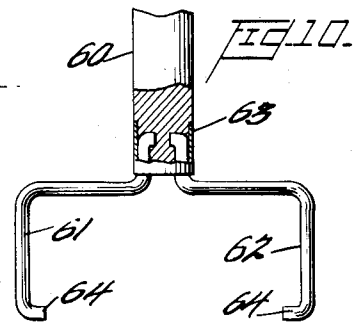
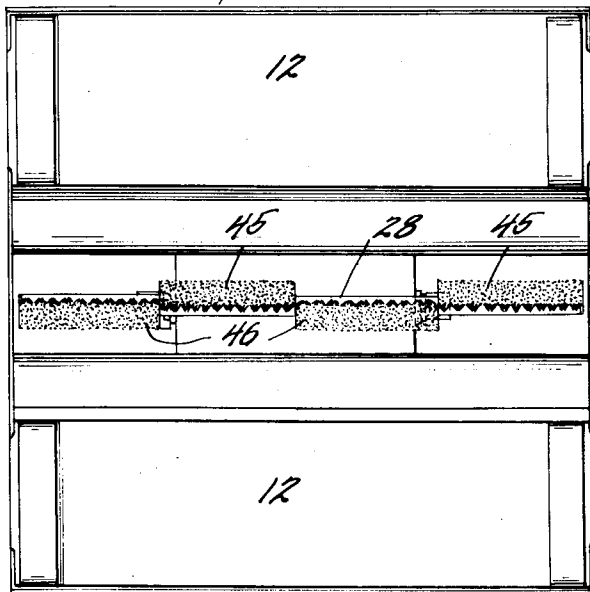
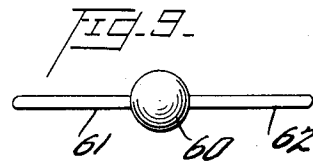
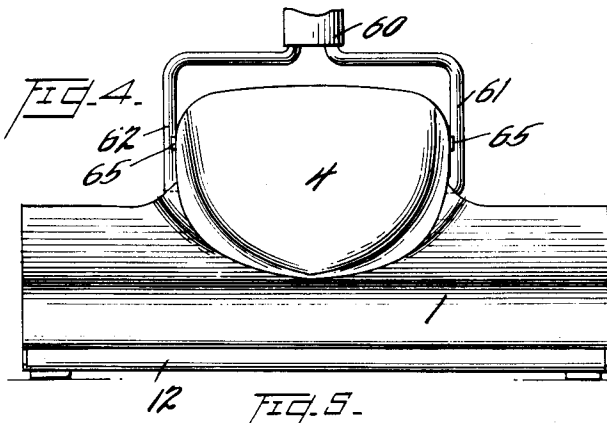


FIG. 14.

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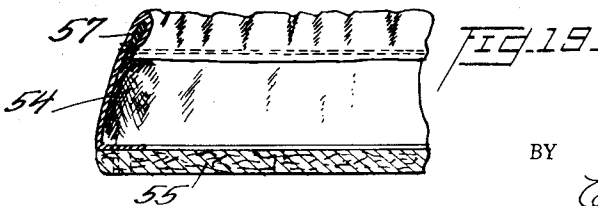
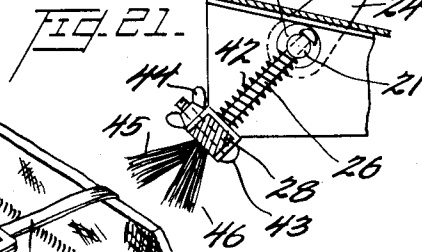
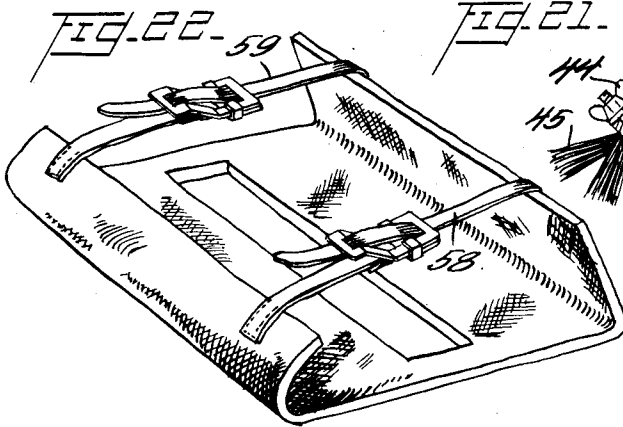
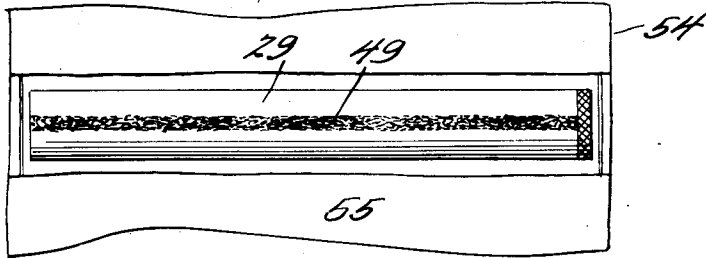
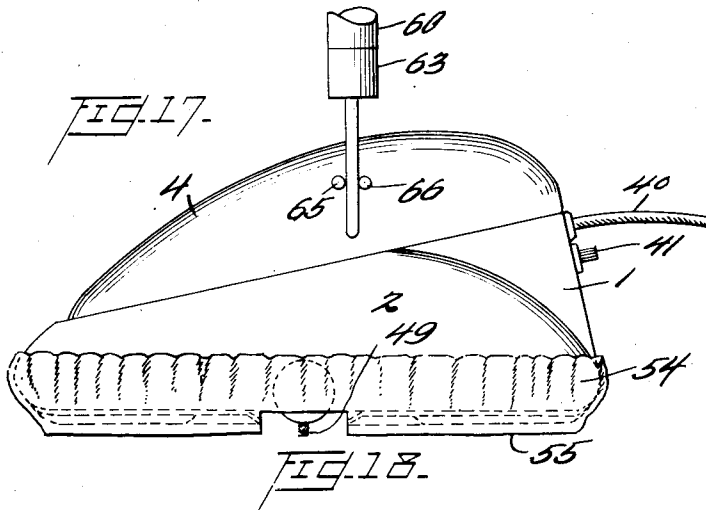
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MACHINE FOR CLEANING AND TREATING FLOORS

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3 Sheets-Sheet 3



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MACHINE FOR CLEANING AND TREATING FLOORS

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10 Claims. (Cl. 15-41)

This invention relates to an improved floor cleaning and treating machine. More particularly, it relates to a power driven machine of the carpet sweeper type for brushing, treating and polishing substantially flat surfaces such as floors, floor coverings and the like.

Various kinds of machines of the manually propelled carpet sweeper type have been produced wherein a rotating brushing element is either driven by connections with the traction wheels or by separate driving connections. Such machines are usually operated by a reciprocatory movement but are not productive of an entirely satisfactory result because in their one way action, the rotating brush tends to flatten the pile of carpets and the like. Moreover, such machines accomplish only a sweeping function and cannot be employed generally for other floor treating results.

It is one of the objects of this invention to provide a general purpose machine of the carpet sweeper type arranged to perform sweeping, polishing and material applying operations in the treatment of floors and floor coverings.

Another object is the provision of a machine for sweeping a carpet or bare floor with an oscillating brushing action by simply moving the machine in one direction over the surface to be cleaned.

A further object of the invention is to provide means for polishing a floor which at the same time applies and distributes a polishing medium.

A further object is the provision of means for brushing into the nap of a carpet powders and the like for moth prevention and other treatment.

A further object of the invention is the provision of a runner or glider supported machine having interchangeable power driven oscillating floor treating units.

Further objects of the invention include the provision of a motor driven machine requiring a minimum of power to operate and the provision of associated floor treating units of novel design.

The invention for carrying out these and other objects will be best understood from the following detailed description and by reference to the accompanying drawings wherein like reference numerals have been used to represent like parts throughout the several views and wherein—

Fig. 1 is a top plan view of an embodiment of the invention.

Fig. 2 is a view in rear elevation of the machine of Fig. 1.

Fig. 3 is a side elevation of the machine of Fig. 1,

1, with the relation of the operating parts being shown in dotted lines.

Fig. 4 is a view in front elevation of the machine of Fig. 1.

Fig. 5 is a bottom plan view.

Fig. 6 is a broken top plan view with the cover or hood removed showing the motor and driving arrangements.

Fig. 7 is a longitudinal sectional view taken on line 7-7 of Fig. 8.

Fig. 8 is a detail sectional view showing the dust pan mounting.

Figs. 9 and 10 are top and side views of the handle, Fig. 10 being partly in section to illustrate the ball mounting.

Figs. 11 and 12 are side and end views, respectively, in elevation illustrating a fluid containing wiper unit.

Figs. 13 and 14 are side and end views, respectively, of the brush unit.

Figs. 15 and 16 are side and end views, respectively, of a powder distributing unit.

Fig. 17 is a side elevation of the machine with an associated polishing shoe.

Fig. 18 is a broken bottom view of the machine showing the arrangement of wiper and polishing shoe.

Fig. 19 is a detail view in section showing the shoe construction.

Fig. 20 is an enlarged detail section on line 20-20 of Fig. 8.

Fig. 21 is an enlarged detail section showing the brush mounting.

Fig. 22 is a perspective view of a modified form of polishing unit.

With reference to the drawings, the machine embodies a housing of the form illustrated having a lower open bottom portion 1 with a formed top wall and vertical side walls 2 and 3, and a detachable dome shaped top portion 4 with its lower edge contoured to fit the top wall of the lower portion. The top is positioned centrally of the lower portion in overlying and covering relationship with respect to an aperture 5 in the top of the lower portion which allows extension therethrough of a sweeping and driving unit adapted to be covered by the dome shaped top. The casing structure is preferably made of metal stampings, although it can be otherwise constructed without departing from the invention. The contour of the housing with its curved surfaces is such as to provide a substantially rigid structure even with the use of light metal stock. In the form shown, the material of the bottom portion formed upwardly to provide the raised

reinforcing and supporting portion 6 having inwardly directed mounting flanges 7 for supporting the underlying sweeper and motor mounting base 8 and the overlying angular lugs 9 which are each apertured to receive an end of a handle bail and are tapped and threaded to receive fastening screws 10 passing through aligned apertures in the top. The top is also apertured to allow passage therethrough of the bail ends into engagement with the lugs 9 and is further provided in its rear side portions with a plurality of ventilating apertures 11.

The lower part of the housing forms, in conjunction with the pivotally mounted dust pans 12, a dust collector and supports the motor driven sweeper mechanism. The dust pans 12 are stamped metal tray-like members having curved rear end walls 13, vertical side walls 14 which fit closely within the side walls of the casing, and transversely extending dirt retaining raised dams 15 for cooperation with a sweeper brush. The dust pans are each pivotally mounted at their respective rear ends at the front and rear corners of the casing on fastenings 16 which extend through the sides of the casing so as to provide a downward swinging movement of the pans outwardly of the casing for dislodgment of collected dirt. Inward swinging movement of the pans is limited by stops 17 which in the closed position of the pans engage the bottom edges of the casing side walls. The spaced relation of opposed free ends of the pans define a transverse slot through which the surface is contacted by the movable floor treating element. The entire structure assembly is supported in definite spaced relationship with respect to a floor or floor covering to be treated by spaced parallel runners or gliders. These gliders or runners may be formed as integral parts of the pans or may be separate members fixed thereto in any well known manner. The runner supports, by their extended surfaces, serve to define a definite supporting relationship of the machine in respect to a surface to be treated, thus providing a more uniform operating result than can be obtained with variable wheel supports and the like. However, the machine may be provided with wheeled supports or their equivalent wherever the same may be deemed advisable.

The sweeping mechanism consists of a unit assembly adapted for support on the underside of the lower housing portion. In the illustrated embodiment, the mechanism embodies a supporting pan-shaped base 8 of stamped metal having substantially horizontal marginal flanges 19 adapted to underlie and engage the supporting flanges 7 and be detachably supported thereon by screws 20 passing through the flanges on the base and housing. The inverted pan-shaped base fits the underside of the casing and closes the opening in the sweeper casing to exclude dust from the driving mechanism. The sweeper and driving mechanism consist of a shaft 21 extending through the mounting base with extensions at either side thereof and journaled in bearings 22 in the sides of the motor mounting base. The shaft is positioned in its bearings by the collars 23 and is arranged to be rotated in an oscillatory movement by the crank lever 24 fixed to the shaft intermediate its bearings. The extended end portions of the shaft are apertured to receive a brush supporting bracket 25 which consists of the headed rod 26 slidably mounted in the transverse apertures in the end portions of the shaft. The rods 26 carry at their free ends the inverted

U-shaped holders 27 adapted to detachably receive and support interchangeable floor treating units consisting of the brush 28, wiper 29 and powder distributor 30.

Motor 31 is supported on the base mounting by an upwardly extending angular stamping member 32. The motor has a driving shaft 33 extending at each side of the motor and carries at one end driving pinion 34, and at the other end, air impeller 35, for forcing a column of cooling air through the ventilating apertures in the dome-shaped cover. A gear 36, in mesh with the pinion 34, is rotatably mounted on stub shaft 37 anchored in the angle bracket and carries a lug 38, pivotally mounting one end of a pitman or rod connection 39 which is pivotally connected with the crank lever 24. Power for the motor is supplied from an ordinary source of house current through the leads 40, and switch 41, at the rear of the casing. The switch affords local control for starting and stopping the machine. When the motor is energized, rotational movement of its shaft and gear connections are converted into an oscillatory or swinging motion of the implement carrying brackets movably mounted in the apertured end of the shaft. This conversion is accomplished by the pivoted rod and crank lever connections. The implement mounting brackets are urged outwardly in their shaft mountings by coil springs 42 interposed between the shaft and the U-shaped connectors for the interchangeable treating devices. These connectors, as illustrated, are apertured to receive the bolt 43 and wing nut 44, adapted to detachably connect the interchangeable floor treating units presently to be described.

The brush 28 consists of a narrow backing member transversely apertured to receive the mounting bolts of the brackets. The brush is distinguished by angularly displaced bristle sections 45 and 46, which are in alternating arrangement throughout the length of the brush. This construction contributes to a substantial reduction in torque and allows the use of a much smaller motor than would be found necessary to operate a brush having aligned bristles. The automatic adjustment of the brush by the spring affords a yielding contact with a treated surface, although it is to be noted that the mounted brush is always urged in a direction to contact the surface through the sweeping slot. This arrangement and the oscillatory movement of the brush produces a sweeping action and result comparable with a normal broom action, and when the machine is slowly moved over a surface such as a high pile carpet or the like, the pile of the carpet is brushed in both directions in differentiation from the action of the conventional rotary brush machines.

Referring to Figs. 11 and 12, there is illustrated therein a wiper unit 47. This consists of an elongated container provided with spaced attachment lugs 48 and an apertured side wall mounting for a wick 49 in communication with the interior of the casing. The casing is closed at one end and at the other end is provided with a detachable screw-threaded plug 50 which can be removed for the purpose of filling the container with polishing fluid or other floor cleaning liquid. This wiping implement is arranged for substitution for the brush in the holding bracket when the machine is employed in waxing and polishing operations. So employed, the wiper is swung in an oscillatory path by the motor and its connections so as to wipe back and

forth across the treated surface in the slot between the opposed edges of the dust pan.

In Figs. 15 and 16, there is shown a container 51, similar to that previously described, having mounting lugs 52 and a filler cap 53. The container differs in structure in that it is provided in its lower side wall with a plurality of apertures extending lengthwise of the container through which powder or other pulverent material may be drifted during an oscillatory movement of the container in its supporting bracket in the machine. This device is particularly useful for treating carpets and the like with substances for preventing moths and for evenly distributing powder over any surface.

Figs. 17, 18 and 19, illustrate a machine equipped with a polishing attachment 54 which can be utilized in conjunction with the wiper previously described in performing polishing operations. The polishing attachment consists of a relatively heavy underlying mat 55, of any suitable material, which is transversely apertured to register with the sweeping slot of the machine so as to provide projections there-through of the wiper or other implement carried by the oscillating brackets. The mat is provided with contractible side walls of flexible material carrying at their upper edge portions a resilient band 57 adapted to hold the polishing unit on the machine, the unit being shaped as to closely engage the bottom of the machine with a neat fit. A modified form of polishing unit is illustrated in Fig. 22 of the drawings. This unit, in lieu of being provided with the elastic side walls, is provided with spaced straps fixed to each end thereof, such straps being designated 58 and 59. The straps are so positioned inwardly of the side edges of the unit that when tightened over the machine housing to fix the unit to the base of the machine, the straps abut upwardly extending portions of the housing, thus preventing lateral displacement. In the arrangement described, it will be apparent that the polishing unit and wiper cooperate to produce the result of simultaneously applying polishing fluid to a floor and polishing the same.

The machine, in any of its operations, is manipulated by a handle 60, which has fixed in its lower end bail members 61 and 62. These bail members are fastened in position by a surrounding ferrule 63 and extend outwardly and downwardly, terminating at their lower ends in inwardly extending horizontal trunnions 64 for engagement with the cover and fastening rods of the machine. This engagement is permitted through the inherent resiliency of the bail members. The handle, when not in use, is normally maintained in a vertical position by the engagement of the downwardly extending bail portions between stops 65 and 66, mounted on opposite sides of the cover. The stops are provided in pairs of unequal height, the shorter one being so arranged that the handle can be tilted rearwardly, in which movement there is sufficient resiliency in the structures to allow the bail to frictionally pass over the shorter ones of the stops.

The operation of the machine and its associated parts will be apparent from the foregoing description. When used as a carpet sweeper, the motor is energized and the machine is progressed in one direction over the surface to be treated. The position of the machine with respect to such surface is maintained by its gliders or runners. The oscillatory movement of the

brush produces a double sweeping action in opposite directions, resulting in a thorough cleaning of floors and pile fabrics. Carpets and the like can be treated with the powder distributor in a like operation of the machine and combined applying and polishing operations are obtainable with the wiper and polishing unit. It will be seen that the machine provides a carpet sweeper with an improved action adapted to produce a plurality of results not heretofore obtainable with such structures.

While the invention has been described in connection with specific embodiments, it is to be understood that the words which have been used are words of description rather than of limitation, and that practice of the invention within the scope of the appended claims may be resorted to without departing from the true scope and spirit of the invention in all its aspects.

I claim:

1. In a machine of the character described, a housing having spaced dust receivers in the bottom thereof defining an open transverse sweeper slot between said receivers, a plurality of spaced projections on the bottom of the housing defining runner surfaces for supporting the machine in predetermined spaced relationship to a supporting surface to be treated, a shaft journaled within the housing extended transversely thereof centrally above the sweeper slot, downwardly extending supporting and driving connections fixed to the ends of said shaft, a floor sweeping member detachably mounted on said connections to contact a supporting surface through the sweeper slot, an electric motor, and driving connections between said motor and said shaft for oscillating said floor sweeping member across said sweeper slot in intermittent sweeping contact with the supporting surface.

2. In a device of the character described, a casing, a unitary motor driven floor treating mechanism, means for detachably mounting said unit in the casing, said unit comprising a mounting base, an electric motor mounted on said base, a shaft journaled in said base and extending transversely thereof with extensions on opposite sides of the base, a floor treating unit extending transversely of the casing for back and forth movement therein, means for yieldably mounting said floor treating unit on said shaft extensions in radially spaced relation to the shaft, and driving connections between said motor and said shaft for driving the floor treating unit in its back and forth movement.

3. In a device of the character described, a casing, a unitary motor driven floor treating mechanism, means for detachably mounting said mechanism in the casing, said mechanism comprising a mounting base, an electric motor mounted on said base, a shaft journaled on said base extending transversely thereof with extensions on opposite sides of the base, a floor treating member extending transversely of the casing for back and forth movement therein, means for yieldably mounting said floor treating member on said shaft extensions in radially spaced relation to the shaft, driving connections between said motor and said shaft for driving the floor treating member in its back and forth movement, said driving connections comprising a crank lever fixed to said shaft, reduction gearing, and a pivoted driving connection between said gearing and said crank lever.

4. In a device of the character described, a casing, dust pans pivotally mounted in the bot-

tom of the casing with free edges thereof in opposed spaced relation and adapted to swing outwardly and away from each other to open the casing, a unitary motor driven floor treating mechanism detachably mounted in the casing, said unit comprising a mounting base, an electric motor mounted on said base, a shaft journaled in said base with transversely apertured extensions on opposite sides of the base, a floor sweeping member extending transversely of the casing for back and forth movement therein across the free edges of said pans, means for yieldably mounting said floor sweeping member in said apertured shaft extensions for radial movement with relation to the shaft to contact a surface between said pans with a back and forth movement, and driving connections between said motor and said shaft for driving the floor treating unit in its back and forth movement.

5. In a device of the character described, a casing, dust pans pivotally mounted in the bottom of the casing with free edges thereof in opposed spaced relation and adapted to swing outwardly and away from each other to open the casing, runners on said pans supporting said casing and pans for movement in predetermined spaced relation to a supporting surface to be treated, a unitary motor driven floor treating mechanism detachably mounted in the casing, said unit comprising a mounting base, an electric motor mounted on said base, a shaft journaled in said base with transversely apertured extensions on opposite sides of the base, a floor treating member extending transversely of the casing for back and forth movement therein across the free edges of said pans, means for yieldably mounting said floor treating member in said apertured shaft extensions for radial movement with relation to the shaft to contact a surface between said pans with a back and forth movement, and driving connections between said motor and said shaft for driving the floor treating unit in its back and forth movement.

6. In a device of the character described, a casing, dust pans pivotally mounted in the bottom of said casing, runners on which said casing and pans are supported for movement in spaced relation to a supporting surface, a unitary motor driven floor treating mechanism detachably mounted in said casing, said unit comprising a mounting base, an electric motor mounted on said base, a shaft journaled in said base and extending on opposite sides thereof, a brush having bristles throughout its length extending transversely of the casing for back and forth movement therein, said bristles being arranged continuously in staggered angularly offset aligned sections to decrease the torque necessary to move the brush across a surface in an uninterrupted sweeping action, means for yieldably mounting said brush on said shaft extensions in radially spaced relation to the shaft, and driving connections between said motor and said shaft for driving the brush in its back and forth movement.

7. In a device of the character described, a casing having a bottom opening in the form of a transverse slot, a detachable surface engaging friction cover mounted on the bottom of said casing and having a transverse aperture therein for registry with the opening in the casing, a unitary motor driven floor treating mechanism detachably mounted in the casing, said unit com-

prising a mounting base, an electric motor mounted on said base, a shaft journaled in said base and extending on opposite sides thereof, a wiper extending transversely of the casing for back and forth movement therein across the openings in the casing and friction element, said wiper consisting of an elongated fluid container having a longitudinally extending slot in the side wall thereof and a wick mounted in said slot communicating with the inside of the container, means for yieldably mounting said wiper on said shaft extensions in radially spaced relation to said shaft, and means connecting the motor and shaft for driving said wiper in its back and forth movement across said openings in contact with a surface to be treated.

8. In a device of the character described, a casing having an apertured top wall and a detachable combined housing and cover mounted over said top wall aperture, a unitary floor treating mechanism supported on the underside of said top wall and extending into said cover, said unit comprising a mounting base constructed and arranged to form a bottom closure for the top wall aperture, an electric motor mounted on the upper side of said base, a shaft journaled in said base and having extensions on opposite sides of the base within the casing, a floor treating unit extending transversely of the casing for oscillating movement therein, means for mounting said floor treating unit on said shaft in radial spaced relation to the shaft, and means connecting said motor and said shaft for driving the floor treating unit with an oscillatory movement.

9. In a device of the character described, a casing having an apertured top wall and a detachable combined housing and cover mounted over said top wall aperture, a unitary floor treating mechanism supported on the underside of said top wall and extending into said cover, said unit comprising a mounting base constructed and arranged to form a bottom closure for the top wall aperture, an electric motor mounted on the upper side of said base, a shaft journaled in said base and having extensions on opposite sides of the base within the casing, a floor treating unit extending transversely of the casing for oscillating movement therein, means for mounting said floor treating unit on said shaft in radial spaced relation to the shaft, means connecting said motor and said shaft for driving the floor treating unit with an oscillatory movement, and means comprising a crank lever fixed to said shaft, a motor driven pinion and reducing gear and a connecting rod pivotally connected with said gear and crank lever.

10. In combination, a casing, a unitary motor driven mechanism detachably mounted in the casing, said mechanism comprising a mounting base, an electric motor mounted on said base, a shaft journaled in the base and extending on opposite sides thereof, a powder distributing unit extending transversely of the casing for oscillating movement therein, said powder distributing unit consisting of an elongated container having its side wall provided with a plurality of sifting apertures throughout the length of the container, means for detachably mounting said powder distributing unit on said shaft in radial spaced relation thereto, and driving connections between the motor and shaft for driving the distributing unit with an oscillating movement.

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