Jan. 14, 1958 O. B. SUTTON 2,819,479

SCRUBBING MACHINE WITH SHIELD AND SUPPORT ATTACHMENT THEREFOR

Filed Feb. 9, 1954 2 Sheets-Sheet 1

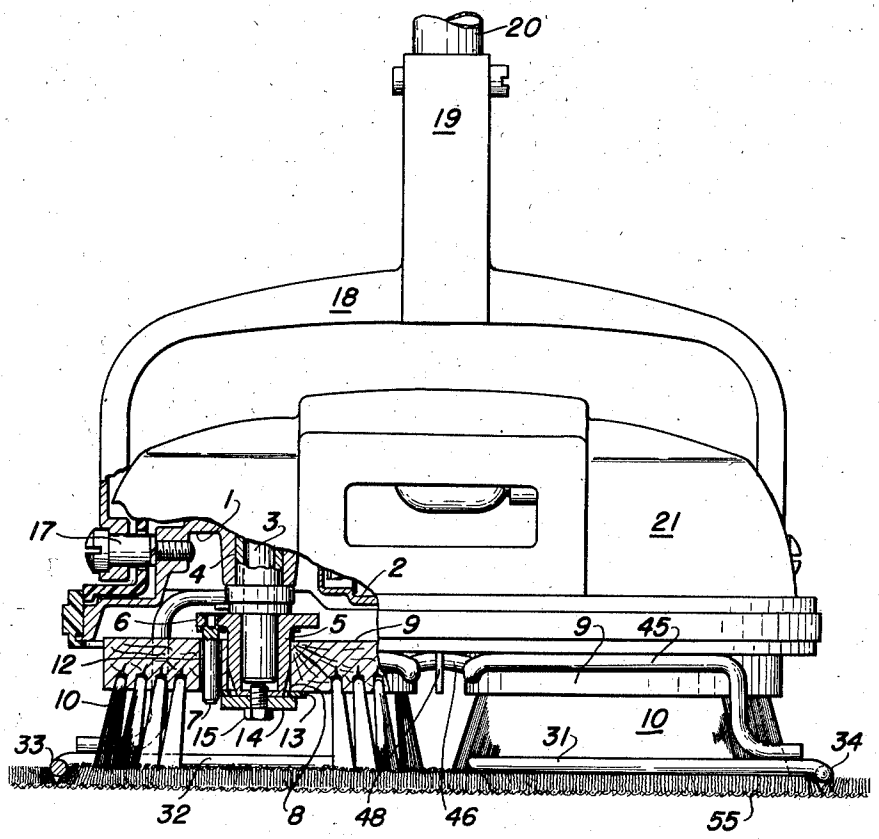


Fig. 1

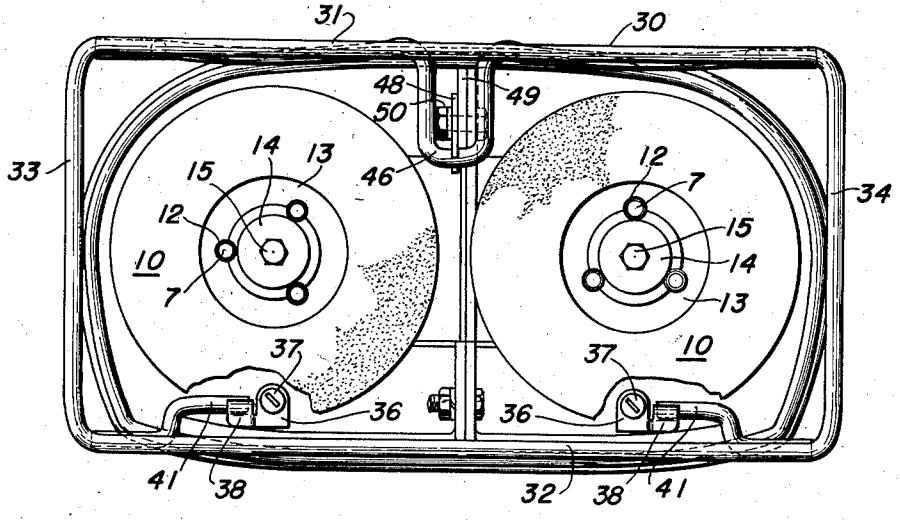


Fig. 2

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SCRUBBING MACHINE WITH SHIELD AND SUPPORT ATTACHMENT THEREFOR

Filed Feb. 9, 1954 2 Sheets-Sheet 2

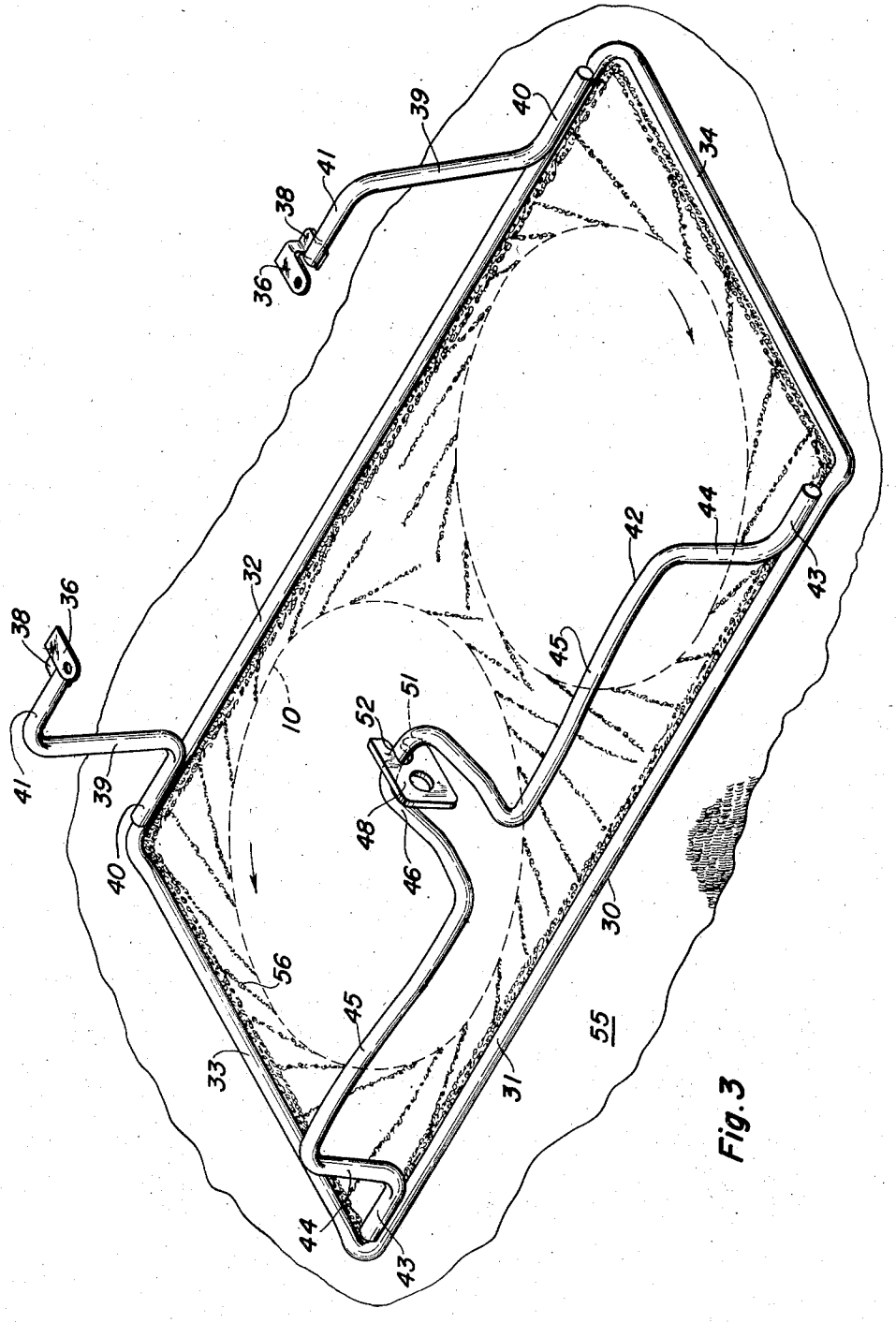


Fig. 3

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SCRUBBING MACHINE WITH SHIELD AND SUPPORT ATTACHMENT THEREFOR

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6 Claims. (Cl. 15—49)

My present invention relates to the art of cleaning machines and is particularly directed to an attachment for floor polishing machines which is simple, light in weight, economical, and readily attachable and detachable to the polishing machine for the purpose of quickly converting the same into a carpet cleaning machine.

It is a principal object of my invention to provide a light-weight but rigid metal frame which is readily attachable to a floor polishing machine to convert the same to a scrubbing machine for cleaning rugs, carpets and the like, and in which the detachable frame serves not only as a supporting skid for the polisher to position the brushes at proper elevation with respect to the carpet to be cleaned, but which also acts as a peripheral barrier member to confine cleaning agents within the perimeter of the frame to prevent same from being scattered by centrifugal force imparted thereto by the rotating brushes.

It is a more specific object of my invention to provide a frame structure readily attachable to a polishing machine so constructed that the same provides longitudinally extending skids at opposite sides of the polisher and transversely extending barriers at a slightly higher elevation at the front and rear of the polisher and in which both barriers and skids also serve to prevent scattering of cleaning material in the use of the device.

Other objects and advantages of my invention will become apparent as the description proceeds when taken in connection with the accompanying drawing wherein:

Figure 1 is a front elevational view, partly in section, illustrating a floor polisher and scrubbing machine embodying my invention;

Figure 2 is a bottom plan view of the apparatus of Figure 1; and

Figure 3 is a perspective view of my novel floor polisher attachment showing the same positioned on a rug and with certain mounting devices attached to the polisher indicated on said view.

The floor polishing machine per se illustrated herein forms no part of my invention except insofar as it combines with and cooperates with the novel frame supporting and shield structure to be described hereinafter. The floor polishing machine illustrated in Figure 1 is substantially that described and claimed in the co-pending application of Erhard Kohl, Serial No. 91,980, filed May 7, 1949, now U. S. Patent No. 2,683,884, dated July 20, 1954, entitled Floor Polisher and assigned to the assignee of this application.

Briefly, the machine illustrated in Figure 1 comprises a cast metal main frame or body member indicated generally by the reference character **1** and which supports a drive motor indicated generally at **2** which in turn is connected through suitable gearing, not illustrated, to a pair of vertical drive shafts **3**, supported in drive bearings **4**, formed in the casting **1** and carrying brush attaching and driving devices at their lower ends. A brush attaching and driving sleeve **5** is carried by the lower end of each shaft **3**. Each sleeve **5** is provided with a radially projecting flange **6** at its upper end from which depend

three drive pins **7**. The sleeve **5** is adapted to be received within a central opening **8** formed in the back **9** of a polishing or scrubbing brush structure which also includes downwardly projecting bristles **10**. The brush back **9** is provided with a plurality of openings **12** which are adapted to receive the drive pins **7** when the sleeve **5** is seated in the opening **8**. Separation of brush back from the drive mechanism is prevented by an annular washer **13** engaging the underside of the brush back and held thereagainst by a slightly smaller washer **14** which is secured to the lower end of sleeve **5** by a stud **15**.

Handle bearing members **17** project from opposite sides of the body **1** and pivotally mount the end portions of the legs of a handle bail **18**. The bail **18** includes a socket portion **19** to which is detachably connected a propelling and manipulating handle **20**.

A plastic electrical insulating and decorative casing **21** is mounted over the cast frame **1** to cover the mechanism therein contained and to present a pleasing appearance.

It has been found that carpets and the like can be cleaned very effectively if subjected to a scrubbing action in the presence of a cleaning agent. In the practice of such cleaning, granular type cleaners, such as those disclosed in the patent to Edwards, 2,364,608, are preferred because of the ease with which they can be sprinkled upon the carpet prior to the cleaning action and also the ease with which they can be removed immediately after the scrubbing action by means of a suction cleaner. Hereinafter the operation of the invention is described in reference to granular cleaners; however, it is to be understood that the invention is equally applicable to other types of cleaners such as liquid detergents and the like.

Two particular problems arise in the use of power-driven scrubbing brushes on floor coverings; namely, if too much pressure is applied to the brushes the scrubbing machine cannot readily be manipulated and the brushes subject the carpet to excessive wear; and the rotating brushes apply centrifugal action to the cleaning agent and tend to discharge a certain amount of the same peripherally of the brush across the surface of the carpet, tending to scatter the cleaning agent and to project the same off the carpet against walls, furniture and the like. The present invention particularly comprises a supporting and guard frame structure which maintains the cleaning machine or polisher at a predetermined height relative to the carpet surface so as to regulate the scrubbing pressure which exists between the carpet surface or nap and the rotating brushes and, in addition, catches and confines radially discharged cleaning material within a small area adjacent the brushes to prevent such material from being projected off the carpet or into undesirable areas.

My invention particularly comprises a rectangular wire or rod frame **30** having front and rear barrier bars **31** and **32** joined at corresponding ends by lateral barrier and supporting skid bars **33** and **34**, respectively. Referring particularly to Figure 1 it is noted that the front barrier bar **31** is at a slightly higher elevation than the lateral skid bar **34**. The purpose of this arrangement is to support the weight or such portion of the weight, of the scrubbing device as is supported on the frame primarily on the lateral bars **33** and **34** which extend in the direction in which the device will normally be reciprocated by the operator. The bars **33** and **34** act as supporting skids and do not offer significant resistance to movement. The bars **31** and **32** extend transversely to the normal direction of movement of the device in use; hence, these bars are at a slightly higher elevation so that they ride against the upper surface of the nap and do not offer undesirable resistance to movement of the cleaning

machine across the carpet. As shown most clearly in Figure 1, the bars 33 and 34 extend down into the nap of the carpet to support a significant proportion of the weight of the apparatus whereas the bars 31 and 32 ride on the surface of the nap.

In order to provide a detachable securing means for the supporting structure 30 the main frame 1 of the polishing machine at its rear underside is provided with a pair of spaced sheet metal latches 36 which are secured to the frame 1 by means of studs 37. As shown most clearly in Figure 3, each of the members 36 is provided with a curved and downwardly-projecting catching segment or wing 38. The rear barrier bar 32 carries a pair of anchoring bars 39 which have lower portions 40 welded to the upper side of the rod 32 adjacent to the end thereof, and free end portions 41 offset upwardly from the frame structure 31, 32, 33, and 34 and received behind the wings 38 of the securing tabs 36. The front portion of the frame structure 30 is provided with an upstanding spring latch section comprising an elongated rod 42 having sections 43 at its opposite ends which lie parallel to the rod 31 and are secured to the upper surface thereof as by welding. The sections 43 join upwardly extending pillar portions 44 which in turn connect to aligned rod portions 45 which are parallel to and above the rod 31 in spaced relation thereto and terminate short of each other adjacent the center of the structure where they join a U-shaped latching section 46. The U-shaped latch section 46 is adapted to detachably engage with a hook member to be described hereinafter.

Referring now particularly to Figures 1 and 2, it will be seen that the frame 1 supports a hook member 48 which is secured to a depending flange 49 of the frame by means of a locking bolt and nut structure 50. The structure of the latch member 48 is best shown in Figure 3 wherein it is seen to comprise a generally C-shaped member having on its lower edge an inclined cam surface 51 adapted to have the bight portion of the member 46 engaged thereagainst to cam the same against the spring action of the frame structure when engaged with the anchoring members 36 to snap over the end of the cam surface 51 into the hooking portion 52 of the member 48. It will be apparent that the spring action of the wire frame will be sufficient to allow the same to give to the small degree required to cause the same to ride along the cam surface 51 and then snap into engagement with the section 52 of the member 48 and that the weight of the parts will normally keep the bight portion of the rod section 46 engaged with the hook section 52 as illustrated in Figures 1 and 3. When it is desired to detach the supporting frame 30 the polisher is turned upside down to the position illustrated in Figures 2 and the rod section 42 is then pressed downwardly, as viewed in Figure 2, to disengage the bight portion of member 46 from hook member 48 after which the sections 41 of the frame structure can be slid upwardly, as viewed in Figure 2, to release the same from members 36 completing detachment of the frame. The reverse operation is followed when the member 30 is applied to the machine.

The position of the frame 30 is such that the skid bars 33 and 34 project below the plane of the working surfaces of the brushes to penetrate the carpet nap and act as weight carrying elements whereas the barrier bars 31 and 32 project substantially to the plane of the working surfaces of the brushes.

As illustrated in Figure 3, the one brush 10 is shown in dash outline to indicate the trace of the outer periphery of the brush upon the surface of the carpet 55. Granular cleaning material on the surface of the carpet is indicated at 56. As the brush 10 rotates in the direction of the arrow, for example, some of the cleaning material 56 is projected radially by centrifugal force from the periphery of the brushes 10. It has been found in practice that cleaning material is projected directly across the nap of the carpet at the upper end thereof and parallel to the surface of the floor and is effectively stopped by the peripheral portions of the frame 30 and entrapped within a small area outside the brushes 10. The phantom view of Figure 3 is intended in this connection primarily to illustrate the manner in which the cleaning material 56 is projected laterally across the carpet parallel to the surface thereof whereby the comparatively small wire frame structure 30 effectively confines the cleaning material in the general area which is actually undergoing cleaning at the moment and, also confines the same to the region in which it can easily and quickly be included within the area actually contracted by the brushes by simple manipulation of the scrubbing machine.

The action of the brushes 10 is to scrub the cleaning material into and against the nap or pile of the carpet being treated so that the same is worked down into the base of the pile and is also scrubbed against each individual fiber whereby the cleaning material is enabled effectively to clean each individual fiber or tuft of the carpet structure and to clean the same from the surface down to a point adjacent the base of the nap producing an effective and thorough cleaning action. After the scrubbing action is completed, the embedded cleaning material is readily removed by a suction cleaner or the like.

The position of the supporting bars 33 and 34 relative to the main frame of the machine is fixed, however, the brushes are self-adjusting with respect to the main frame of the machine and the supporting bars 33 and 34. As shown most clearly in Figure 1, the brush back 9 is free to move vertically with respect to the sleeve 5 and drive pin 7, the lower limit of movement of the brush with respect to the main frame being determined by the stop washers 13 and 14. The parts of the apparatus are so proportioned that the washers 13 and 14 will occupy positions with respect to the supporting bars 33 and 34 that the ends of the brush bristles will rest upon all types of carpet to support the weight of the brush thereon and to allow the brush to have a floating; that is, vertically unrestricted, engagement with the carpet nap. The washers 13 and 14 thus serve only to prevent the brushes from leaving the sleeves 5 when the machine is raised. Additionally, the brush bristles engage the carpet nap with a force equal only to the weight of the brush which prevents too deep a penetration of the bristles into the carpet nap, undesirable wear on the carpet and prevents the bristles from engaging the carpet to an extent sufficient to make the machine difficult to move.

From the foregoing it is believed to be apparent that I have provided a simple, economical device which is readily attachable to and detachable from an existing floor polisher or scrubbing machine and which will rapidly convert the same into an effective carpet scrubbing device which is particularly characterized in that it supports the weight of the scrubbing machine except the brushes and floats the brushes on the nap of the carpet being cleaned. The supporting and shield frame confines the cleaning compound within the immediate area of the polishing machine so as to avoid scattering of the cleaning compound and discharge of the same off the edge of the carpet or rug and into undesirable areas of the room within which the cleaning is being performed.

While my invention has been described herein in its preferred form of a separately salable attachment for converting a floor polisher to a carpet scrubbing machine, it is within the scope of my invention to have the frame permanently attached to a machine primarily intended for scrubbing carpets.

While I have illustrated and described the invention in considerable detail, it is to be understood that various changes may be made in the arrangement, proportion and construction of parts without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A carpet scrubbing machine comprising a body portion, a pair of rotary brushes mounted on the body por-

tion, means on the body portion for rotating the brushes, a support and guard frame attached to the body portion, said frame including a rectangular portion surrounding said brushes and positioned below said body portion to engage the carpet being cleaned and formed to support the machine with the brushes engaging the surface of the carpet and including front and rear portions positioned to ride on the surface of the carpet and side portions depending below said front and rear portions, said front, rear and side portions serving to confine cleaning material within the area beneath said brushes.

2. A carpet scrubbing machine comprising a body portion, a pair of rotary brushes mounted on the body portion in side by side relation, a propelling handle attached to the body portion for pivotal movement in a plane normal to the plane of said brush axes, means on the body portion for rotating the brushes, a support and guard frame attached to the body portion, said frame including a rectangular portion surrounding the brushes in spaced relation thereto and positioned below the body portion to engage a carpet being cleaned to support the weight of the body portion with the brushes engaging the surface of the carpet, said rectangular frame portion having front and rear portions positioned to ride on the surface of the carpet being cleaned and side portions depending below the front and rear portions bearing on the carpet for guiding the machine thereon.

3. Apparatus according to claim 1 wherein the frame includes a pair of upstanding bars on one side thereof and an upstanding latch arm on the other side thereof, catches on the underside of the body portion adapted to engage the upstanding bars and a latch keeper on the underside of the body portion having a hook portion and a cam surface adapted to cam the latch arm into engagement with the latch keeper.

4. In a carpet cleaning machine having a body portion and a depending rotary surface cleaning brush, means mounting the brush on the body portion for limited vertical movement with respect thereto, the combination of an open wire frame surrounding the brush in spaced relation thereto and support and spacing members extending between the frame and body portion to position the frame to engage a carpet to be cleaned to support the machine with the brushes floating on the surface to be cleaned and to confine cleaning material discharged by the brush, said frame including side skid members adapted to sink into the carpet being cleaned for supporting the weight of the machine and front and rear portions connecting the opposite ends of said skid members and positioned thereabove to rest on the surface of the carpet being cleaned.

5. Apparatus according to claim 4 wherein the frame is rectangular in plan, the support and spacing members comprise arms on one side of the frame projecting upwardly therefrom and terminating in free end portions lying parallel to the said one side of the frame in spaced relation thereto, members on the underside of the body portion engaging the said free end portions, a member projecting upwardly from the side of the frame opposite to said one side thereof and including a latch portion spaced from the frame, a latch keeper on the body portion adapted to engage the latch portion to secure the frame to the body portion and a cam on the body portion for guiding the latch portion into engagement with the latch keeper against the resilience of the frame.

6. In a carpet cleaning machine having a body portion and a depending rotary surface cleaning brush, means mounting the brush on the body portion for limited vertical movement with respect thereto, the combination of an open wire frame surrounding the brush in spaced relation thereto, and support and spacing members extending between the frame and body portion to position the frame to engage a carpet to be cleaned to support the machine with the brushes floating on the surface to be cleaned, said frame including sections on opposite sides thereof projecting below the other portions of the frame to form weight-carrying skids bearing on the carpet and all portions of the frame being positioned relatively to the working surface of the brush to form a barrier for stopping and confining cleaning material discharged from the brush.

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