Aug. 11, 1936. J. F. MILLIGAN 2,050,361

CARPET SWEEPER

Filed June 22, 1933

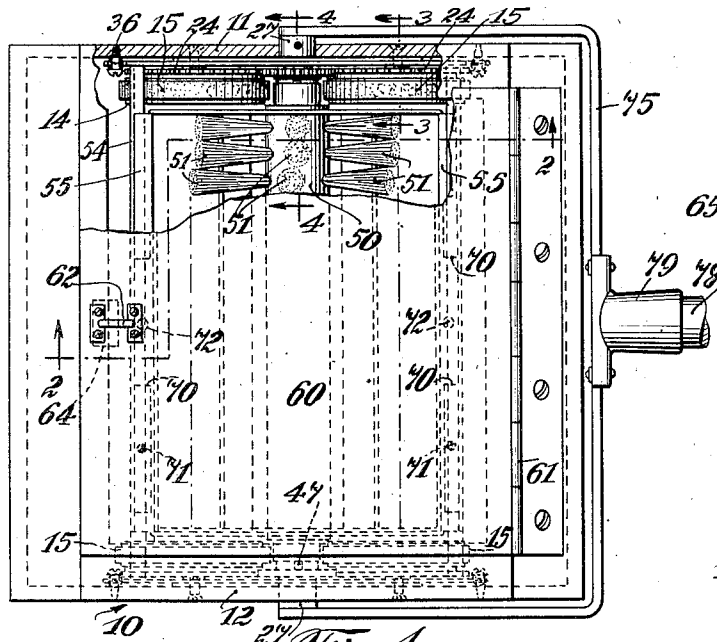


Fig. 1.

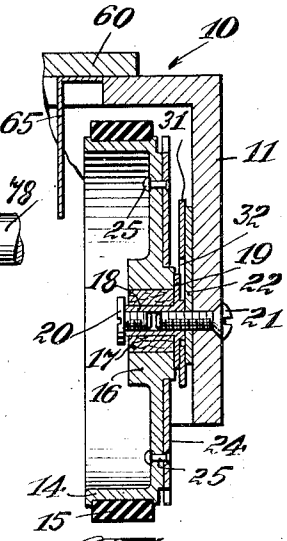


Fig. 3.

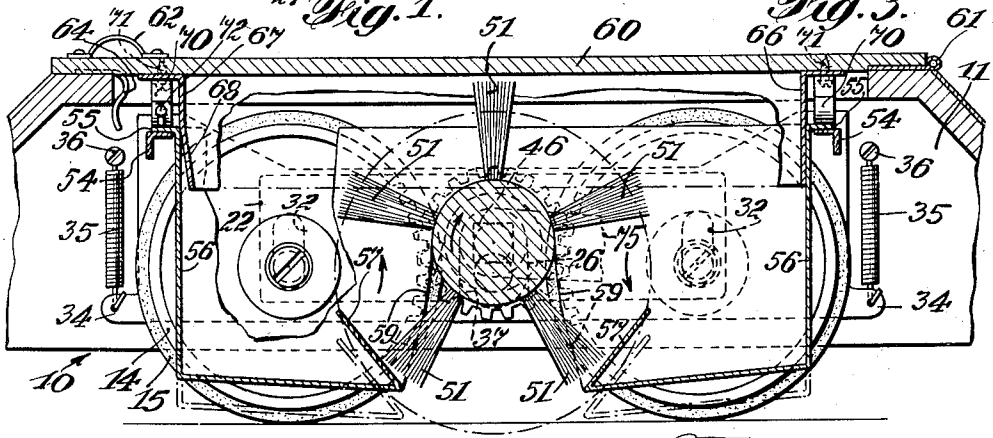


Fig. 2.

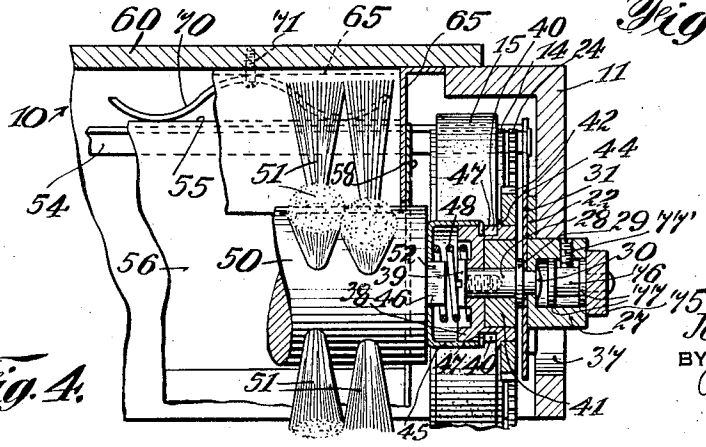


Fig. 4.

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CARPET SWEEPER

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Application June 22, 1933, Serial No. 677,031

15 Claims. (Cl. 15—41)

This invention relates to improvements in sweeping devices and more particularly to improvements in sweeping devices of the character known commonly as carpet sweepers.

An object of the invention is to provide a carpet sweeper in which the bristles can be moved downwardly relative to the frame and driving mechanism to permit deeper penetration of the bristles into the nap of the article being swept.

Another object of the invention is to provide a positive drive connection between the bristle carrier and the driving and sweeping wheels of the device.

A further object of the invention is to provide a dust collector or pan so mounted as to follow the bristles in their upward and downward movement.

A further object of the invention is to provide a mounting for a dust pan of such character that the dust pan can be lifted as a unit through an opening in the top of the containing box.

A still further object of the invention is to provide means for assuring movement of the dust pan along with movement upwardly and downwardly of the bristle carrier.

In accordance with the present invention, the sweeping mechanism of the carpet sweeper is mounted in a box or container of conventional type. This box has secured therewithin several (preferably four) driving and supporting wheels which are fastened directly to the walls of the box. These driving wheels are provided with gears which mesh with gears operatively connected to a bristle roll. The bristle roll is mounted for rotation relative to two carrier plates which are suspended adjacent the walls of the box. These carrier plates can be moved downwardly an amount determined by openings in the walls of the box within which fit connecting members attached to the handle of a device. Springs normally force the carrier plates into their uppermost position. The carrier plates have extending therebetween, bars to support a dust pan which is cut away to fit over the bristle roll. The top of the box is provided with an opening of such size as to permit the insertion of the dust pan into the box and withdrawal of the same therefrom. A hinged lid is provided for this opening, which lid has dust guards to fit within the dust pan and also has springs to cause the dust pan to remain seated on the supporting bars. With this construction, it is possible to move the bristle roll downwardly relative to the box and the driving wheels, and at the same time to cause the dust pan to be moved in a corresponding manner whereby it is possible to have the bristles penetrate into the nap of the article being swept.

Other features and advantages of the invention will become apparent by reference to the following detailed description read in the light of the accompanying drawing, wherein

Fig. 1 is a plan view, partially in section, of a sweeper embodying the invention.

Fig. 2 is an enlarged section taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged section taken substantially on the line 3—3 of Fig. 1; and

Fig. 4 is an enlarged section taken substantially on the line 4—4 of Fig. 1.

Referring now to the drawing, 10 indicates the casing or box within which are mounted the operating parts of the sweeper. This casing 10 may be of any desired shape, such as conventional shape of the casing of carpet sweepers, or any other convenient shape. Secured within the casing and to the side walls 11 and 12 thereof are four drive wheels 14 which are provided preferably with rubber tires 15. The hub 16 of each wheel is provided with a specially treated wooden bearing member 17 rotating about a bearing collar 18. This collar 18 is provided with an annular flange 19 against which an end of the wooden bearing 17 and a part of the hub 16 press. A screw 20 threaded into the bearing sleeve 18 holds the wheel on the sleeve. A second screw 21 passing through a side wall 11 is in threaded engagement with an opposite end of the bearing sleeve to lock the same against a spacing plate 22 (preferably metal). A spacing plate 22 is provided for each side wall of the sweeper and they are held in place by the screws 21 which secure the bearing sleeves of the two drive wheels in place. From Fig. 3 it will be noted that the flange 19 is spaced a small distance from the spacing plate 22 for a purpose to be explained later. Secured to each driving wheel 14 is a gear wheel 24 which may be fastened to the wheel by rivets 25 or by any other suitable means.

Each spacer plate 22 is cut away as indicated in dotted lines 26, Fig. 2, for the passage therethrough of a hollowed-out cylindrical member 27 (Fig. 4). A bearing pin 28 having a flange 29 is rigidly fastened to the cylinder 27 by riveting or otherwise as shown at 30. A thin metallic plate 31 is secured between the flange 29 and the end of the cylinder 27 so that any movement up or down of the cylinder 27 causes a corresponding up and down movement of the plate 31.

Each plate 31 is provided with slots 32 shown in dotted lines in Fig. 2 through which pass ex-

tensions on the bearing sleeves 18 with the plate 31 fitting between the flanges 19 of the bearing sleeves 18 and the spacer plates 22. The plates 31 are provided at each end with extensions 34, each pierced to receive one end of a spring 35, the other end of which is fastened as by screw 36 to the inner side of the side walls of the box. The side walls 11 and 12 naturally are cut away to receive the hollowed cylinder 27 and the cut away portion extends downwardly a considerable distance as shown at 37, in Fig. 4, so that the two cylinders 27 can be forced downwardly the desired amount. The springs 35 serve to force the plate 31 upwardly normally so that the cylinders 27 are normally held against the upper part of the slot 37 in the side walls of the casing 10.

A metallic hub 38 rotatable about the end of the bearing pin 28 is held thereon by a screw 39 threaded into the end of the pin. This hub 38 has a flange which extends toward the wall of the casing and which is provided with a number of slots 40 entirely therethrough. The flange part is hollowed-out and a wooden bearing member 41 is forced thereinto for rotation about the bearing pin 28. A fabric gear 42 is pressed upon the end of the flange of hub 38 to rest against a shoulder 44 thereof. The teeth of this fabric gear 42 mesh with the teeth of the gears 24 secured to the two drive wheels 14. As shown in Fig. 4, the wooden bearing block 41 is mounted between the hub 38 and the flange 29.

Secured over the inner end of each hub 38 is a roll attaching member 45 in the nature of a cylinder having an end closed except for a square opening 46 therein, the purpose of which will be explained hereinafter. This attaching member is secured to the hub by means of a plurality of fingers 47 which are bent down into the slots 40 cut in the extension of the hub. A coil spring 48 between the hub 38 and the end of the member 45, serves to press this member inwardly of the casing at all times.

The sweeping member of the invention consists of a roll 50 made of some suitable material, such as wood, in the periphery of which are mounted a plurality of tufts of bristles 51. Each end of the roll 50 is provided with a square extension 52 of such size as to fit in the opening 46 in the attaching member 45.

Extending between the opposite upper ends of the plates are a pair of dust pan supporting bars 54, which are made as angle bars in the present instance. The dust pan consists of a rectangular metallic pan having an open top and having a pair of oppositely disposed flanges 55 to rest on the bars 54. The side 56 of the pan extends downwardly to a point below the bottom of the casing or box 10. The bottom of the pan is cut along the center line and then is bent upwardly to form angular flanges 57 so positioned as to be swept over by the bristles 51. The two ends of the pan 58 have portions cut away at the central part as indicated in heavy and dotted lines at 59 in Fig. 2. This cut away part permits the pan, when introduced through the open top of the box 10, to fit over the roll 50 as shown in Fig. 4.

The top of the box 10 is open as shown for the insertion and removal of the dust pan, and is provided with a cover 60 hinged at 61 and provided with a handle 62. A spring 64 secured to the underside of the cover makes detachable engagement with the edge of the opening in the box to lock the cover in place.

The cover is provided with dust guards at each end thereof, one being shown at 65 to fit closely within the end of the dust pan. A similar guard 65 is provided at the other end of the opening. A rear guard 66 fits closely within one side of the dust pan, while a front guard 67 having an angle portion 68 fits within the other side of the dust pan. These guards which are made of sheet metal, are provided with flanges for screw engagement with the underside of the top 60.

Secured also to the underside of the top 60 are a number of springs 70 each fastened thereto by means of a screw 71. These four springs are so positioned as to bear against the flanges 55 of the dust pan to hold the dust pan firmly against the supporting bars 54. The flanges 55 of the dust pan may be provided with handle knobs 72 to be grasped either manually or by some suitable tool for raising the dust pan to remove it from the box.

The sweeper is provided with a bail 75, the extremities of which have bearing members 76 fitting in the hollowed-out cylinder 27. These bearing members 76 may be provided with flanges 77 to permit them to be locked in these cylinders 27 by a set screw 77' or by any other suitable means. An operating handle 78 fits in a socket 79 on the bail.

The use and operation of the sweeper is substantially as follows. Assuming that the operating parts of the device have been secured within the box in the manner shown in the drawing, the dust pan can be positioned therein as shown in Fig. 2 and the lid closed. When the parts are properly positioned within the box and the device is in normal or static condition, the roll 50 is in its uppermost position, such position being determined by the upper boundaries of the slots 37 in the side walls of the box 10. The springs 35 hold the brush in this position by raising the plates 31. It should be noted that the mesh between the teeth on the gears 24 and on the gear 42 is a loose mesh so that the roll 50 can be moved upwardly and downwardly while the mesh is maintained. In other words, the only position of the roll in which the mesh of the teeth is close, is a position in which the axis of the roll falls on a line connecting the axes of the driving wheels 14.

When it is desired to sweep a carpet, it is necessary only to push the sweeper along such carpet by means of the handle 78. Movement of the box causes a movement of the driving wheels 14, which movement is in turn communicated to the roll 50 through the gear connection shown. This connection assures a positive drive of the roll so that there is no danger of slippage even though considerable resistance to rotation of the roll is encountered. It will be evident, of course, that the driving force is communicated from the gear 42 through the hub 38 to the attaching member 45, and thence to the square extensions 52 on the roll. The fingers 47 being bent down into slots in the hub, assure that rotation of the hub will cause rotation of the attaching member.

If it is desired that the bristles penetrate deeper into the nap of a rug, such penetration can be accomplished by pressing downwardly upon the handle, which downwardly pressure is communicated through the bail 75 to the hollowed-out cylinders 27. This downward pressure forces the hollowed-out cylinders 27 downwardly against the resistance of the springs 35, and as a consequence, the roll 50 also is pressed down-

wardly relative to the driving wheels 14 and the box 10. As the roll moves downwardly, naturally the two plates 31 move downwardly carrying with them the supporting bars 54. The springs 70 press the dust pan downwardly also so that it follows the roll in its downward movement. The normal and depressed positions of the roll and of the dust pan are shown in Fig. 2.

When pressure is relieved from the handle and the sweeper manipulated in the usual manner, the springs 35 pull the plates 31 upwardly again, thereby moving the roll and the dust pan back to normal position.

Should it become desirable at any time to remove the bristle roll for the purpose of cleaning the bristles, such removal can be accomplished by pressing the attaching members 45 outwardly against the resistance of the springs 48, thereby relieving the extensions 52 from engagement with the squared openings 46 in the attaching members. The roll can then be lifted through the opening in the top of the box.

When the dust pan becomes filled with dust, it can be removed easily by lifting the cover 60 and then lifting the pan from the interior of the box. This arrangement does away with objectionable shaking or dumping of the dust collector upon a paper whenever it becomes filled as is the common practice.

It will be apparent from the foregoing that the present invention provides a carpet sweeper which possesses many points of novelty and advantage over prior structures. The arrangement wherein the bristle roll can be moved upwardly and downwardly to cause the bristles to penetrate the nap of the rug to a desired extent without forcing the wheels of the device more deeply into the rug, permits a more thorough cleaning of any nap surface, and in addition, actually permits the sweeper to be used on wooden floors, since the bristles are capable of penetrating the cracks between the boards of the floor. The arrangement by which the bristle roll can be easily removed from the driving mechanism, aids materially in the removal of lint from the bristles. Furthermore, the bearings of the driving mechanism are made of suitable material which does not require lubricant, thereby overcoming the objection of lubricant dropping onto a rug. Another advantage resides in the fact that the dust pan can be lifted as a unit from the box permitting emptying the same in a cleaner and more sanitary manner than can be accomplished in other devices of this character.

In view of the foregoing, it will be apparent that the invention is capable of modification, and accordingly, any limitations imposed thereupon are to be only such limitations as are set forth in the following claims.

I claim:

1. A device of the character described comprising a casing, driving and supporting wheels rotatably secured thereto, roll supporting mechanisms secured at opposite sides of said casing, said mechanisms being capable of limited vertical movement, a bristle roll rotatably supported between said supporting mechanisms, driving connections between said roll and said driving wheels, and a dust pan supported by said supporting mechanisms for movement therewith.

2. A device of the character described comprising a casing, driving and supporting wheels rotatably secured thereto, carrier plates slidably secured to opposite sides of the casing, bearing members permanently attached to said plates, attaching members rotatable on said bearing members, a bristle roll detachably secured to said attaching members, driving connections between said attaching members and said driving wheels, and a dust pan supported by said carrier plates for movement therewith.

3. A device of the character described comprising a casing, driving and supporting wheels rotatably secured thereto, a bristle roll therein, driving connections between said driving wheels and said roll, said casing having an opening in the top thereof for the insertion of a dust pan fitting over said roll, and an open top dust pan insertable into and removable from the casing through said opening in the top thereof.

4. A device of the character described comprising a casing, driving and supporting wheels rotatably secured thereto, a bristle roll therein, driving connections between said driving wheels and said roll, said casing having an opening in the top thereof for the insertion of a dust pan fitting over said roll, and said roll being mounted for limited vertical movement and means for causing said pan to move with said roll.

5. A device of the character described comprising a casing, driving and supporting wheels rotatably secured thereto, roll supporting mechanisms secured at opposite sides of said casing, said mechanisms being capable of limited vertical movement, a bristle roll rotatably supported between said supporting mechanism, driving connections between said roll and said driving wheels, a handle attached to said supporting mechanisms to control vertical movement thereof relative to said casing, a dust pan straddling said roll and having dust compartments on each side of said roll, and means for causing said dust pan to move vertically with said roll.

6. A device of the character described comprising a casing, driving and supporting wheels rotatably secured thereto, a bristle roll therein, driving connections between said driving wheels and said roll, said casing having an opening in the top thereof for the insertion of a dust pan fitting over said roll, an open top dust pan insertable into said casing through said opening, said pan having compartments on each side of said roll.

7. A device of the character described comprising a casing, driving and supporting wheels rotatably secured thereto, roll supporting mechanisms secured at opposite sides of said casing, said mechanisms being capable of limited vertical movement, a bristle roll rotatably supported between said supporting mechanisms, driving connections between said roll and said driving wheels, a dust pan supported by said supporting mechanisms for movement therewith, and yielding means permitting limited upward movement of the dust pan independently of said roll.

8. A device of the character described comprising a casing, driving and supporting wheels rotatably secured thereto, carrier plates slidably secured to opposite sides of the casing, a bristle roll rotatably mounted on said plates, driving connections between said bristle roll and said driving wheels, a dust pan supported by said carrier plates for movement therewith, and yielding means permitting limited upward movement of the dust pan independently of said plates.

9. A device of the character described comprising a casing, driving and supporting wheels rotatably secured thereto, a bristle roll therein, driving connections between said driving wheels and said roll, said casing having an opening in the top thereof for the insertion of a dust pan

fitting over said roll, and said roll being mounted for limited vertical movement and means for causing said pan to move with said roll, said means permitting limited upward movement of the dust pan independently of said roll.

10. A device of the character described comprising a casing, driving and supporting wheels rotatably secured to said casing on axles fixed to said casing, carrier plates mounted for limited vertical movement relative to said casing and said wheels, said plates being provided with slots fitting around said axles to guide the plates in their vertical movement, means for normally holding said plates in their uppermost positions, a brush roll rotatably mounted between said plates for vertical movement therewith, and driving connections between said wheels and said roll.

11. A mounting for a brush roll comprising a pair of spaced plates, shaft members fixedly secured to said plates in alinement, attaching members secured to said shaft members for rotation thereabout and having parts movable longitudinally relative to said shaft members, a brush roll having the ends thereof detachably secured to the longitudinally movable parts of said attaching members for rotation therewith, and means for rotating said attaching members.

12. A mounting for a brush roll comprising a pair of spaced plates, shaft members fixedly secured to said plates in alinement, attaching members secured to said shaft members for rotation thereabout and having parts movable longitudinally relative to said shaft members, means for normally resiliently forcing the longitudinally movable parts of the attaching members toward each other, a brush roll having the ends thereof detachably secured to the longitudinally movable parts of said attaching members for rotation therewith, and means for rotating said attaching members.

13. A mounting for a brush roll comprising a pair of spaced plates, shaft members fixedly secured to said plates in alinement, attaching members secured to said shaft members for rotation thereabout and having parts movable longitudinally relative to said shaft members, means for normally resiliently forcing the longitudinally movable parts of the attaching members toward each other, openings in the confronting ends of the longitudinally movable parts of said attaching members, a brush roll having its ends shaped to fit in said openings whereby the roll rotates with the attaching members, and means for rotating the attaching members.

14. A device of the character described comprising a casing, driving and supporting wheels rotatably secured thereto, a driven bristle roll therein, said casing having an opening in the top thereof, a cover for closing said opening, and a pair of dust receiving compartments positioned on opposite sides of said roll, said compartments being connected for simultaneous movement into and out of said casing through the open top thereof, and having their tops open for the emptying of their contents.

15. A device of the character described comprising a casing, driving and supporting wheels rotatably secured thereto, a driven bristle roll therein, said casing having an opening in the top thereof for the insertion of a dust pan, and a dust pan having walls corresponding to the walls of said casing, opposite walls of said pan having slots therein to fit over said bristle roll, said pan having intermediate upwardly diverging walls adjacent the surface of the bristle roll dividing the pan into opposite compartments, and having its top open for the emptying of its contents.

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