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SUCTION CLEANER APPARATUS

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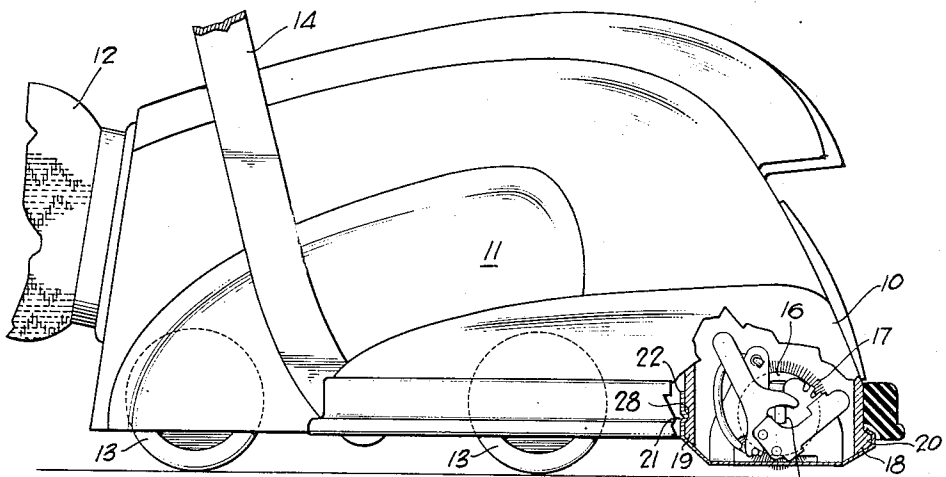


FIG. 1.

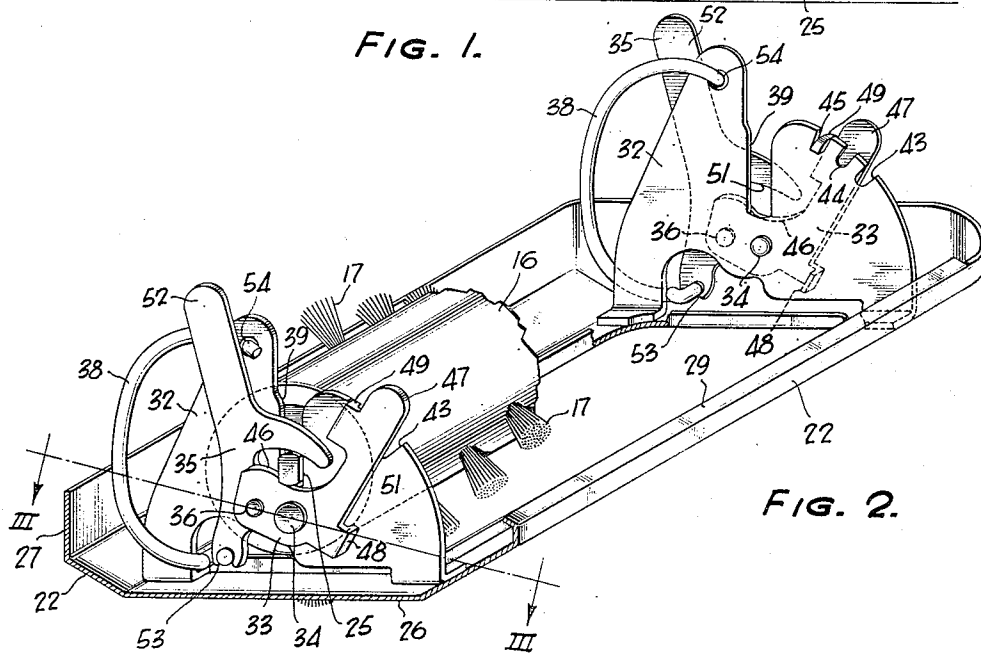


FIG. 2.

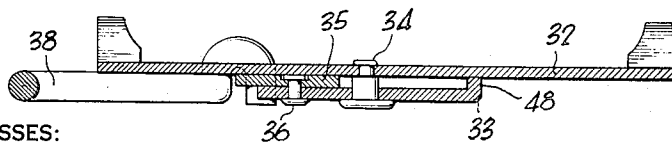


FIG. 3.

WITNESSES:

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SUCTION CLEANER APPARATUS

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9 Claims. (Cl. 15-8)

This invention relates to suction cleaning apparatus, and it has for an object to provide improved apparatus of this type.

A further object is to provide an improved mounting for the revoluble surface contacting member, such as the rotating brush commonly used in the nozzle.

A further object is to provide an improved adjustable mounting for the revoluble surface contacting member whereby, upon wearing, it may be more readily adjusted to contact the surface.

A further object is to provide an improved mounting which will securely hold the revoluble surface contacting member in proper position and will permit it to be readily adjusted to compensate for wear and also to be readily removed, without the use of tools and with minimum effort.

These and other objects are effected by this invention as will be apparent from the following description and claims taken in connection with the accompanying drawing forming a part of this application, in which:

Fig. 1 is a side elevation of a suction cleaner with the invention applied thereto, with parts broken away to show the details of the invention;

Fig. 2 is a perspective view, with parts cut away, showing the invention; and,

Fig. 3 is a partial section taken on line III-III of Fig. 2.

The suction cleaner shown for the purpose of illustrating this invention may be of any conventional type. The cleaner shown in Fig. 1 includes generally, a body 11 formed with a nozzle 10 and housing the usual suction fan and its drive motor. A bag 12, shown broken away, for catching and holding the dirt discharged by the suction creating apparatus is attached to a rear portion of the cleaner. Wheels 13 are provided to support the cleaner on the surface to be cleaned and permit it to be easily moved over the surface. A handle 14, shown broken away, is provided for moving the cleaner over the surface to be cleaned. A surface contacting element 16 is rotatably mounted in the nozzle 10 by a mounting frame 22. In the present embodiment this element is a brush roll having tufts of bristles 17 for brushing the surface to be cleaned.

The nozzle 10 has a front wall 18, a rear wall 19, and a pair of end walls. The front wall 18 has a bead 20 thereon and the rear wall 19 has a recess 21 therein. The functions of this bead and recess will be explained hereinafter.

The brush roll 16 has a shaft extending axially

therethrough and projecting axially from the respective ends of the brush roll. The projecting ends of the shaft are rotatably mounted in bearings 25.

The mounting frame 22 for the brush roll 16 includes a base member 26 which has an aperture therein that provides an inlet for the nozzle. The base member 26 has a substantially upright flange 27 around it. The flange 27 is higher on the rear side than on the other sides and has a boss 28 formed therein, the function of which will be explained hereinafter. The front portion of the flange 27 has a bent-over portion 29, the function of which will be explained hereinafter. A pair of end members 32 are attached to the base 26 by any suitable method, such as welding. An adjustable seat member 33 is pivoted to each of the end members 32 at 34. A latching member 35 is pivoted to each of the seat members 33 at 36. Each latching member 35 is positioned between the seat member 33 to which it is pivoted and the respective end member 32. A pair of springs 38 are provided for biasing the latching members 35. The end members 32 are provided with slots 39 for receiving and guiding the bearings 25 which are carried on projections extending endwise from the respective ends of the brush roll 16. It will be understood that if no bearings are provided for the projections, the projections themselves may be rotatably carried in the slots 39.

Each of the adjustable seat members 33 has a cam-shaped edge 46 which extends across the respective slots 39. These edges provide adjustable seats for the bearings 25. Looking at Fig. 2, it will be seen that the cam edges 46 are shaped so that when the adjustable seat members 33 are rotated in clockwise direction the bearing seats 46 will be raised. Accordingly, when the seat members 33 are rotated in counterclockwise direction, the bearing seats 46 will be lowered.

The seat members 33 are spaced from the end members 32 by bent-over portions 48 which bear against the end members 32. Handles 47 are provided for moving the seat members to adjust the bearing seats. The handles are held in their adjusted position by projections 49 which engage in notches 43, 44 or 45 in the end members 32.

Each of the latching members 35 has a cam-shaped latching edge or surface 51. The latching surface 51 is designed so that the distance from the surface 51 to the center of the pivot 36 is of a decreasing value from the outer or open end of the cam surface to its inner or closed end. This shape of the latching surface 51

enables the latching members, when in closed position, to always apply a pressure to the bearings 25 to hold them down against their seats 46.

As hereinbefore mentioned, the latching members 35 are pivoted to the seat members 33 and carried up or down as the seat members are adjusted to move the seats 46 up or down. Handles 52 are provided for moving the latching members to their desired positions. The springs 38 are attached to the latching members at 53 and to the end members 32 at 54. It will be seen from Fig. 2 that when the point 53 is to the left of a straight line through the pivot point 36 and the point 54, the springs 38 will bias the latching members 35 towards latching position. Due to the cam shape of the latching portions 51 the bearings 25 will be held down tight against their seats 46. When the point 53 is moved to the right of the straight line through the point 36 and the point 54, the springs 38 will bias the latching members 35 towards their unlatched position.

When it is desired to mount a new brush roll 16 in the cleaner nozzle, the assembly shown in Fig. 2 is removed from the nozzle and placed on the floor. Then the latching members 35 are moved to unlatch the bearings 25 and the brush roll is lifted from between the end members 32. After the old brush roll has been removed, the seat members 33 are adjusted so that the projections 49 engage slots 43. With the seat providing members so adjusted, the bearing seats 46 will be in their uppermost position, which is the proper position for a new brush roll. The new brush roll is placed between the end members 32 with the bearings 25 engaged in the slots 39 and the latching members 35 are moved so that the surface 51 contacts the bearings 25 to hold them down on their seats 46. After the brush roll has been properly adjusted in the mounting as described above, the assembly is inserted into the nozzle 10 of the cleaner as shown in Fig. 1. The assembly is held in the nozzle by hooking the turned-down portion 29 of the flange 27 over the bead 20 on the front wall 18 of the nozzle 10 and snapping the boss 28 in the rear portion of the flange 27 into the recess 21 in the rear wall 19 of the nozzle 10.

When it is desired to adjust the brush roll to a lower position, the assembly shown in Fig. 2 is removed from the nozzle and placed on the floor as described hereinbefore. Then the latching members 52 are moved to unlatch the bearings 25 and the seat members 33 are moved so that the projections 49 engage the selected slots 44 or 45 that will give the desired adjustment. The latching members 42 are then moved to their latching position and the assembly is replaced in the nozzle as hereinbefore described.

The seat members 33 are made of resilient material and the projections 49 may be disengaged from the slots 43, 44, and 45 by bending the handle portions 47 of the members 33 away from the end members 32 far enough to withdraw the portions 49 from the slots and permit the seat member 33 to be moved to effect the desired adjustment of the seats 46 for the projections or bearings 25. The resiliency of the members 33 is such that when they are released they will spring back to substantially their original shape and the projections 49 will engage with the respective slots to which the seat members 33 have been adjusted and will hold the seat members in their adjusted position.

Only three slots 43, 44, and 45, equally spaced for providing three equal adjustments, are shown, but it will be understood that any desired number of slots may be provided to provide any desired number of adjustments, and the slots may be spaced different distances apart to provide different degrees of adjustment.

It will be realized from the foregoing description taken in connection with the drawing that this invention provides an improved mounting for the revoluble surface contacting member of a suction cleaner which will securely hold it in proper position, and permit it to be readily adjusted upon wearing so that it will properly contact the surface undergoing cleaning. This improved mounting will permit the surface contacting element to be readily adjusted or removed without the use of tools and with minimum effort.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. A suction cleaner having an intake nozzle, a revoluble surface contacting element having a projection extending endwise therefrom, mounting means for said surface contacting element including means for receiving said projection, other means providing a seat for said projection, said seat being adjustable, relative to said receiving means, toward and away from the intake to said nozzle, latch means connected to said seat-providing means, and means biasing said latch means against said projection to hold the same down on said seat.

2. A suction cleaner having an intake nozzle, a revoluble surface contacting element having projections extending axially therefrom, means for mounting said surface contacting element including members having slots therein for receiving said projections, means pivoted to said slotted members and providing seats for said projections, said seats being adjustable toward and away from the intake to said nozzle, latch means pivoted to said seat-providing means, and means biasing said latch means against said projections to hold the same down against said seats.

3. A suction cleaner having an intake nozzle, a revoluble surface contacting element having projections extending axially therefrom, means for mounting said surface contacting element including a base member, end members attached to said base member, said end members having slots therein for receiving said projections, means pivoted to said end members and having an edge extending across said slots and providing vertically adjustable seats for said projections, latch means attached to said seat providing means and vertically movable therewith, and means biasing said latch means against said projections to hold them down against said seats.

4. A suction cleaner having an intake nozzle, a revoluble surface contacting element having projections extending axially from the respective ends thereof, mounting means for said surface contacting element including a base member, end members attached to said base member near the respective ends thereof, said end members having slots therein for receiving said projections, members attached to said end members and having

cam-shaped portions for providing vertically adjustable seats for said projections, latch members attached to said seat-providing members and movable with respect thereto, said latch members having a cam-shaped surface for engaging said projections, and spring means biasing said cam-shaped surface of said latch members against said projections with sufficient force to hold said projections down tightly against said seats.

5. A suction cleaner having an intake nozzle, a revoluble surface contacting element having projections extending axially from the ends thereof, means for mounting said surface contacting element including a base member, end members attached to said base member, said end members having slots therein for receiving said projections, members movable with respect to said end members and each having an edge extending across one of said slots and providing vertically adjustable seats for said projections, latch means attached to said seat members and movable with respect thereto, and spring means coacting between said mounting means and said latch means and biasing said latch means against said projections with sufficient force to hold the same down against said seats.

6. A suction cleaner having an intake nozzle, a revoluble surface contacting element having a projection extending from each end thereof, means mounting said surface contacting element in said nozzle, said mounting means including a base member, end members attached to said base member, said end members having slots therein for receiving said projections, a seat member pivoted on each of said end members, each of said seat members having a cam-shaped surface movable across said slots and providing vertically-adjustable seats for said projections, a latch member pivoted on each of said seat members, each of said latch members having a cam surface that engages the projection on the respective end of said surface contacting element, and means biasing said latch members so that when they are in latching position said cam surfaces bear against said projections with a substantially constant pressure to hold the projections down tightly against their seats.

7. A suction cleaner having an intake nozzle, a revoluble surface contacting element having a projection extending from each end thereof, means mounting said surface-contacting element in said nozzle, said mounting means including a base member, end members attached to said base member, said end members having slots therein for receiving said projections, a seat member pivoted on each of said end members, each of said seat members having a cam-shaped surface movable across said slots and providing vertically-adjustable seats for said projections, a latch member having a cam-shaped surface for holding said projections down on the seat members, said latch members being pivoted to the seat members and

vertically movable with the seat members so that when the seat members are adjusted vertically the distance between the seat members and the cam-latching surface remains substantially constant, and spring means biasing said latch members so that when they are in latching position they bear against said projections with a pressure sufficient to hold said projections down against their seats.

8. A suction cleaner having an intake nozzle, a revoluble surface contacting element, a projection extending from each end thereof, means mounting said surface-contacting element in said nozzle, said mounting means including a base member, end members attached to said base member, said end members having slots therein for receiving said projections, a seat member pivoted on each of said end members, each of said seat members having a cam-shaped surface movable across said slots and providing vertically-adjustable seats for said projections, a latch member pivoted to each of said seat members and vertically movable with said seat members, each of said latch members having a cam-shaped surface that engages the respective projection on the surface-contacting element when the latch members are in latching position, the distance from said cam surface to the latch pivot being a decreasing value from the outer end of the cam surface to its inner end, said latch members and said seat members being so constructed and arranged that in all positions of the seat members the distance from the seats to the outer ends of the cam-shaped portions of the latch members is greater than the diameter of the projections on the surface-contacting element, and tension spring means coacting between said base member and said latch members and biasing said latch members toward latching position with sufficient force to hold said projections down tightly on the seats.

9. A suction cleaner having an intake nozzle, a revoluble surface contacting element having a projection extending from each end thereof, means for mounting said surface contacting element in said nozzle and, for each projection, including a member having a slot therein for receiving the projection, a pivoted seat member having a cam-shaped surface extending across said slot and providing a seat which is adjusted vertically as the seat member is rotated about its pivot, means for adjusting the angular position of the seat member about its pivot, and a latch member pivoted to the seat member for holding the projection down on the seat, the shape of the cam surface of the seat member and the location of the pivot for the latch member being so related that they are raised or lowered substantially equally as the seat member is rotated on its pivot, whereby the projection may be held in any one of several different vertical positions.

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