

Feb. 25, 1947.

C. H. TAYLOR

2,416,420

SUCTION CLEANING APPARATUS

Filed March 31, 1944

2 Sheets-Sheet 1

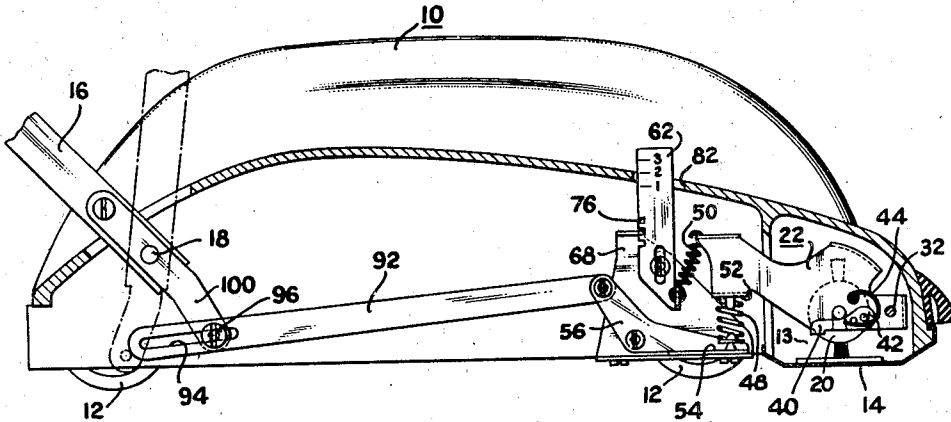


FIG. 1

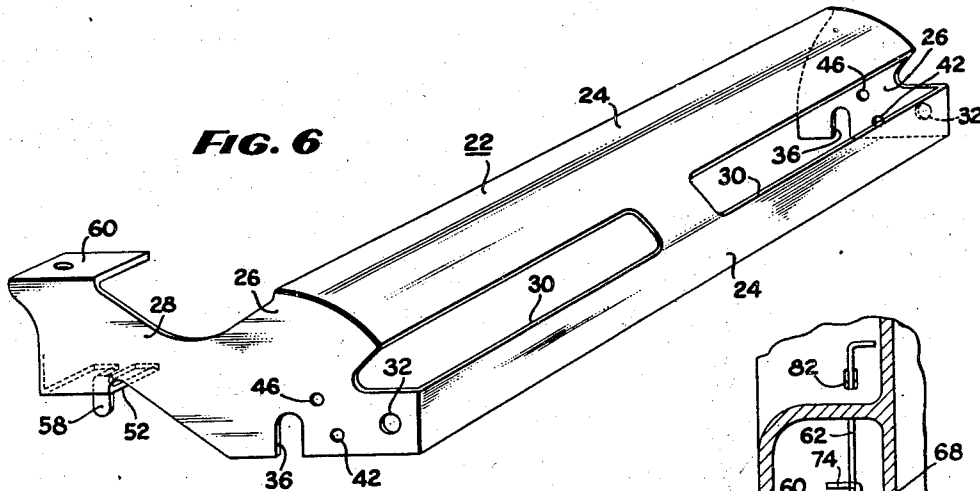


FIG. 6

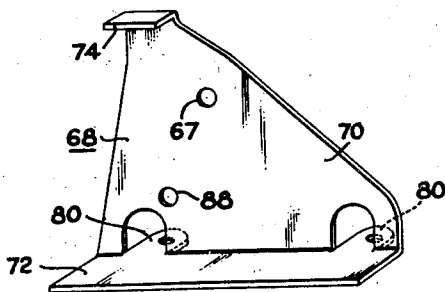
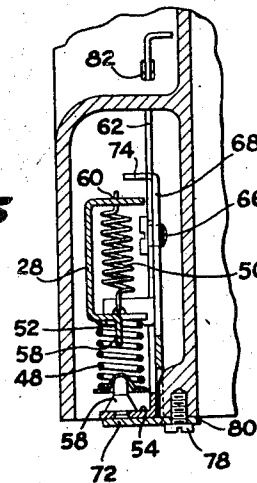


FIG. 7

WITNESSES:

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FIG. 5



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2 Sheets-Sheet 2

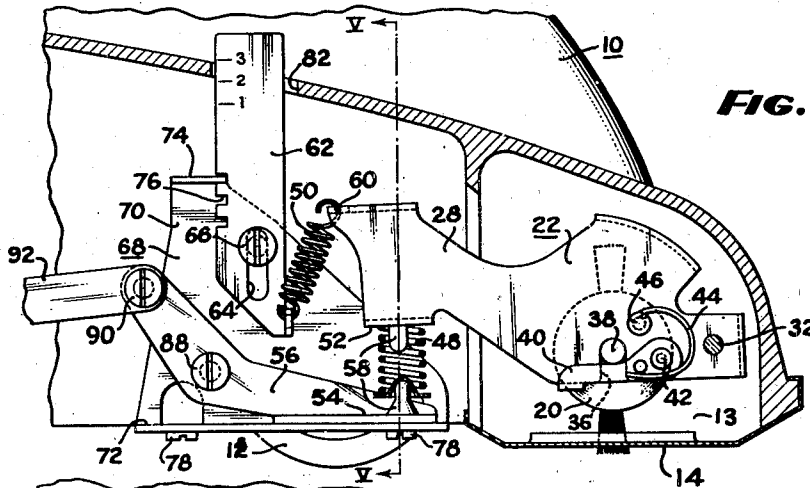


FIG. 2

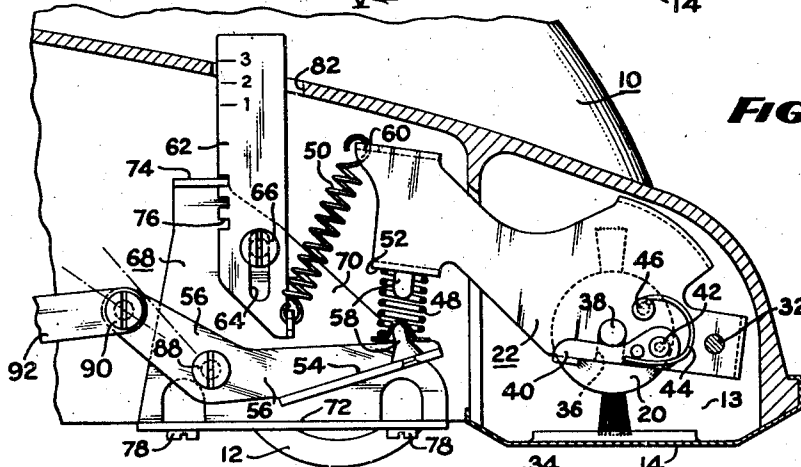


FIG. 3

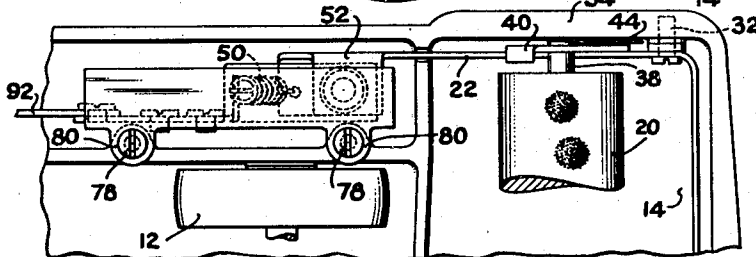
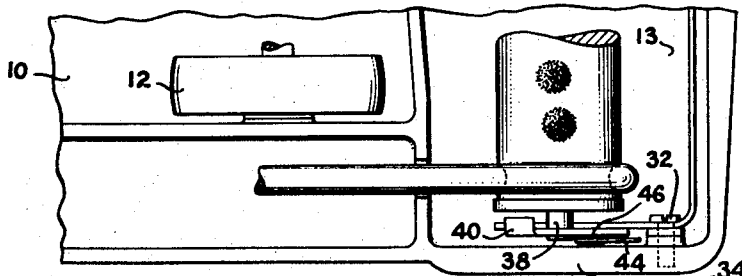


FIG. 4



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SUCTION CLEANING APPARATUS

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5 Claims. (Cl. 15—8)

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This invention relates to a suction cleaner of the type provided with a revolving brush roll adapted to act on the surface being cleaned.

One object of the invention is to produce an improved cleaner of the type set forth.

A further object is to produce an improved brush roll mounting whereby the brush roll exerts a yielding pressure against the surface being cleaned.

A still further object is to produce an improved adjustable brush roll mounting whereby the pressure exerted by the brush roll may be varied.

A still further object is to produce improved means whereby the brush roll may be raised from, or lowered into contact with the surface being cleaned, without affecting the setting of the pressure adjustment of the brush roll.

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

Fig. 1 is a view, partly in vertical section and partly in side elevation of a suction cleaner embodying my invention, certain parts being omitted;

Fig. 2 is an enlarged view of the righthand portion of Fig. 1;

Fig. 3 is a view similar to Fig. 2 with the brush roll raised out of contact with the surface being cleaned;

Fig. 4 is a bottom plan view of Fig. 3;

Fig. 5 is a section on line V—V of Fig. 2;

Fig. 6 is an enlarged perspective view of a part of the brush roll mounting; and

Fig. 7 is an enlarged perspective view of another part of the brush roll mounting.

In Fig. 1 of the drawings there is shown a suction cleaner including a casing 10 supported by front and rear wheels 12 and provided with a suction nozzle 13 having a bottom mouth or opening 14. The cleaner is moved about by means of a propelling handle 16 pivoted at 18, and is provided with the usual revolving brush roll 20 disposed in the nozzle 14. The fan motor unit, the filter bag and such other parts as are not shown or described are all conventional and form no part of this invention.

In order to mount the brush roll 20 according to my invention, I provide a mounting bracket 22 which is clearly shown in Fig. 6 and which includes an elongated body portion 24, end walls 26 and an arm or extension 28. The body portion 24 is cut out at 30 to lighten the construction. The mounting bracket 22 is disposed within the

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nozzle 13 and is pivoted at 32 to the opposite side walls 34 of the cleaner casing 10 (see Fig. 4). The end walls 26 are provided with notches 36 which receive the opposite ends of the shaft 38 of the brush roll 20. The brush roll is removably held in position with reference to the bracket 22, by a pair of latches 40, pivoted at 42 to the opposite end plates 26 of the bracket 22, and biased upwardly by a pair of springs 44 secured to the end plates 26, at 46. When it is desired to install or remove the brush roll, the latches 40 are rotated counterclockwise until they clear the openings 36.

In order to cause the brush roll to contact the surface being cleaned with a predetermined yielding pressure, the arm or extension 28 of the bracket 22 is biased upwardly by a compression spring 48 and downwardly by a tension spring 50. The spring 48 is confined between an abutment 52 formed at the rear lower end of the arm 28 and an abutment 54 carried by or forming part of a lever 56 which will hereinafter be further referred to. Upper and lower centering or guiding projections 58 prevent shifting of the spring 48. The spring 50 is attached at its upper end, as at 60, to the upper rear end of the arm 28 and is secured at its lower end to the lower end of an adjusting arm 62. The strength of the spring 48 is such that, in the absence of any tension by the spring 50, the spring 48 will balance the weight of the brush roll 20 and bracket 22 and will raise the brush roll out of contact with the surface being cleaned. Conversely, the strength of the spring 50 is such that when it is tensioned, it further compresses the spring 48 and moves the brush roll downwardly into contact with the surface being cleaned. The arm 62 is provided with a slot 64 which slidably engages a pin 66 which is threaded or otherwise secured in an opening 67 in a fixed supporting bracket 68. The supporting bracket 68 includes a vertically disposed body portion 70 and a horizontal portion 72 which carries or forms a rest for the abutment 54 above mentioned. The body portion 70 is provided with a flange 74 which is adapted to engage any one of three notches 76 formed in the juxtaposed side of the adjustment arm 62. The supporting bracket 68 is secured to a suitable portion of the frame of the cleaner by screws or the like 78 engaging apertured lugs 80. The lugs 80 and the flange 74 are preferably struck out from the body portion 70 of the bracket 68, as best shown in Fig. 7. The upper end of the adjustment arm 62 extends through an opening 82 in an upper wall of the cleaner casing.

With the parts adjusted as shown in Fig. 1, the

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numeral 2 on the arm 62 registers with the edge of the opening 82 or some other suitable index, and the middle notch 76 on the arm 62 engages the flange 74 of the supporting bracket 68. This represents the medium position of the brush roll 20. In this position, the spring 50 is somewhat stretched, so that it exerts a corresponding downward pull. The downward pull of the spring 50 and the weight of the brush roll 20 and the bracket 22 are sufficient to overcome the force of the spring 48 to lower the brush roll 20 into contact with the surface to be cleaned. This surface, such as a carpet, rug, or the like, resists the downward movement of the brush roll so that the brush roll now exerts a yielding pressure against such surface. The pressure thus exerted is determined by the difference between the weight of the brush roll 20 and bracket 22 and the downward force of the spring 50 on one hand and the upward force of the spring 48 on the other. If the arm 62 is raised so that the bottom notch 76 engages the flange 74 of the bracket 68, the tension of the spring 50 is decreased, and the pressure of the brush roll 20 against the carpet is likewise decreased. Similarly if the arm 62 is depressed until the top notch 76 engages the flange 74, as in Fig. 2 the pressure of the brush roll 20 against the carpet is increased.

It will be noted that the spring 50 is so disposed as to urge the upper end of the arm 62 in counterclockwise direction in which one of the notches 76 will engage the flange 74. To disengage the arm 62, the upper end thereof is moved in clockwise direction against the action of the spring 50. While three notches 76 are shown to represent low, medium and high brush pressure, other intermediate points of adjustment may be provided.

It will thus be seen that by this construction the brush roll 20 contacts the surface being cleaned yielding and with a pressure having a predetermined value. It will also be seen that this predetermined pressure value may be increased or decreased by changing the setting of the adjustment arm 62.

In order to prevent damage to the surface being cleaned by the prolonged rapid rotation of the brush roll on one spot of such surface, as when the cleaner is left unattended, or when the cleaner is converted from floor nozzle to attachment hose cleaning, it is desirable to provide means for raising and maintaining the brush roll entirely out of contact with the surface, and for lowering the brush into its surface-contacting position when the cleaner is returned to normal use. It is also desirable that the raising and lowering of the brush roll be accomplished without affecting the brush roll pressure adjustment so that, when the cleaner is returned to floor nozzle cleaning, the brush roll will exert the same degree of pressure to which it may have been adjusted prior to interruption of the floor nozzle cleaning operation. To accomplish this object, the bell crank 56, which carries the lower abutment 54 of the spring 48, is pivoted at 88 to the supporting bracket 68. The rear end of the crank 56 is pivoted at 90 to the front end of a link 92. The rear end of the link 92 is provided with a slot 94 which slidably engages a pin 96 carried by an extension 100 of the handle 16.

When the handle 16 is moved within its normal range of operation the pin 96 slides back and forth in the slot 94. When the handle 16 is moved to a vertical position, the pin 96 engages the rear end of the slot 94 and pulls the link 92 to the left. This results in moving the abutment 54 upwardly

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to the position shown in Fig. 3 in which the brush roll 20 is raised out of contact with the surface on which the cleaner rests. It will be noted that the raising of the brush roll is accomplished without changing the setting of the adjustment arm 62 so that, when the handle 16 is again lowered into its normal range of operation the brush roll will resume its initial position. This will be clearly seen from Figs. 2 and 3 in both of which the top notch 76 of the adjustment arm 62 engages the flange 74 of the supporting bracket 68.

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. The combination with a suction cleaner including a nozzle having a downwardly facing mouth and a rotary brush roll disposed in said nozzle above said mouth and adapted to act upon a surface to be cleaned, of means for causing said brush roll to contact said surface with a predetermined yielding pressure including a first spring normally biasing said brush roll upwardly with a force sufficient to counteract the weight thereof, a second spring adapted to bias said brush roll downwardly, and adjusting means for varying the biasing action of said second spring to vary the yielding pressure of said brush on said surface, a handle movable within a predetermined range for propelling the cleaner over the surface to be cleaned, and means operable by movement of said handle from said range of movement to a substantially vertical position for raising said brush roll relative to the mouth of the nozzle and out of contact with the surface being cleaned, and for returning the brush roll into contact with the surface being cleaned when said handle is returned to said range.

2. A suction cleaner comprising a suction nozzle having a downwardly facing mouth, a brush roll mounting bracket extending longitudinally of said nozzle, means pivotally securing the front end of said bracket to said nozzle, a brush roll carried by said bracket above said mouth and adapted to act on a surface to be cleaned, an arm extending rearwardly from said bracket, a compression spring normally biasing said arm upwardly to raise said bracket and said brush roll away from said surface, a tension spring secured to and adapted, when tensioned, to exert a downward pull on said arm to cause said brush roll to contact said surface with a yielding pressure, and adjusting means for varying the force of said tension spring to vary the pressure of said brush roll on said surface.

3. The structure recited in claim 2 together with a handle movable within a predetermined range for propelling said surface, and a lever operatively connected to said arm and said handle, said lever and said springs being so constructed and arranged that, when said handle is moved from said range of movement to a substantially vertical position, said lever raises said bracket and takes said brush roll out of contact with said surface, and when said handle is returned to said range of movement said bracket is lowered and said brush roll automatically contacts said surface with the same pressure it exerted before said handle was raised to said vertical position.

4. The combination with a suction cleaner in-

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cluding a nozzle having a downwardly-facing mouth and a rotary brush roll disposed in said nozzle above said mouth and adapted to act upon a surface to be cleaned, of means for causing said brush roll to contact said surface with a predetermined yielding pressure including a first spring normally biasing said brush roll upwardly with a force sufficient to counteract the weight thereof, a second spring adapted to bias said brush roll downwardly, adjusting means for varying the biasing action of said second spring to vary the yielding pressure of said brush on said surface, said adjusting means including a movable member connected to one end of said second spring and so arranged that movement of said member in one direction will increase the downward biasing action of said second spring, and a stop engageable with said movable member for locking said movable member in any position to which it is moved, said movable member and said second spring being so arranged that said second spring biases said movable member into engagement with said stop.

5. The combination with a suction cleaner including a nozzle having a downwardly facing mouth and a rotary brush roll disposed in said nozzle above said mouth and adapted to act upon a surface to be cleaned, of means for causing said brush roll to contact said surface with a predetermined yielding pressure including a first spring normally biasing said brush roll upwardly

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with a force sufficient to counteract the weight thereof, a second spring adapted to bias said brush roll downwardly, and adjusting means for varying the biasing action of said second spring to vary the yielding pressure of said brush on said surface, means for retaining said adjusting means in any adjusted position including a stop, and graduated means carried by said adjusting means and engageable with said stop, said adjusting means and second spring being so arranged that said second spring biases said adjusting means in a direction to cause said graduated means to engage said stop.

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