March 5, 1940. V. E. CARLSON 2,192,397

SUCTION CLEANER

Filed Oct. 20, 1937

Fig. 1

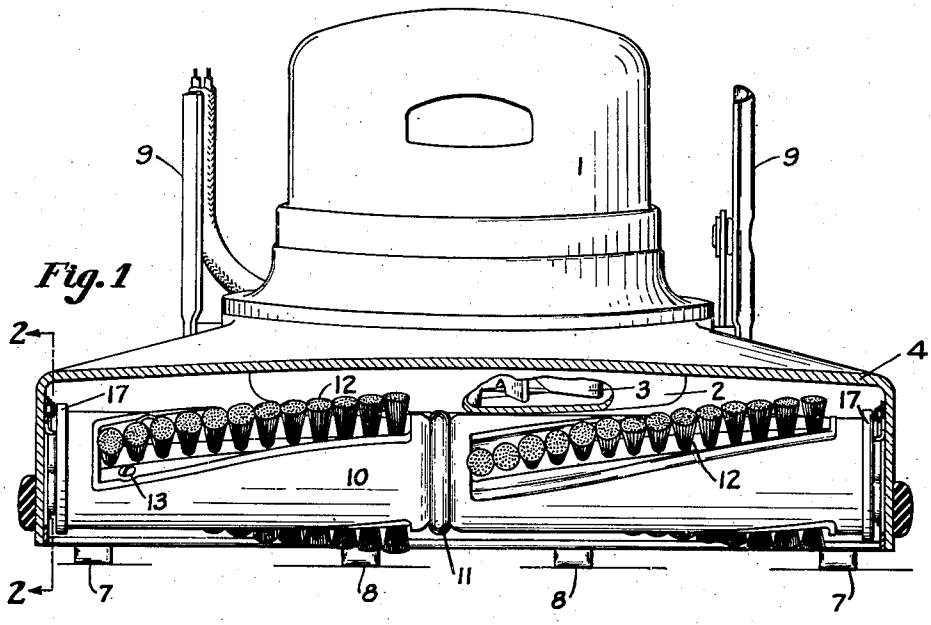


Fig. 2

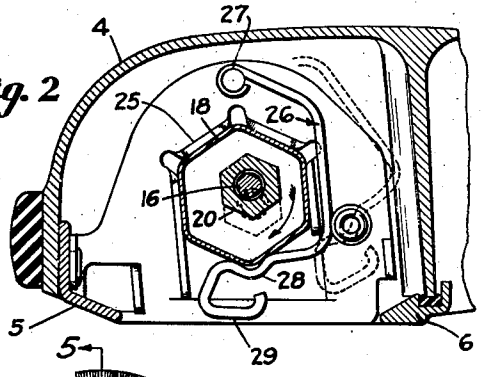
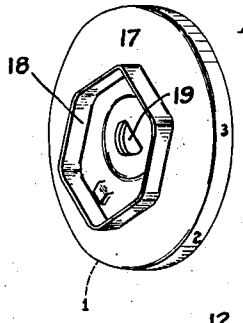


Fig. 3



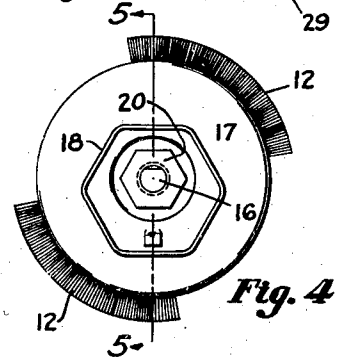


Fig. 4

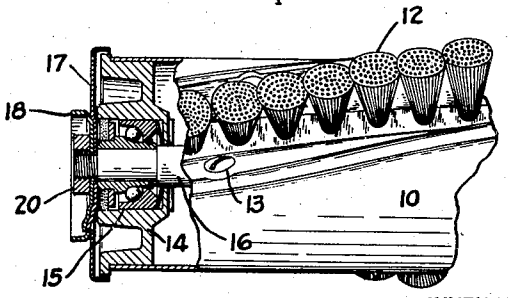


Fig. 5

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SUCTION CLEANER

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Application October 20, 1937, Serial No. 169,956

1 Claim. (Cl. 15—8)

The present invention relates to suction cleaners in general and particularly to new and novel improvements in agitator mounting means in a suction cleaner. More specifically the invention comprises an improved agitator mounting by which the suction cleaner agitator is adjustably positioned in a plurality of positions, thereby making possible compensation for brush bristle wear, and which provides for the removal of the agitator from the supporting cleaner body.

The modern suction cleaner uses suction and agitation to effect surface covering cleaning. The suction is produced by a motor-driven fan which reduces the pressure within the cleaner nozzle resulting in the movement of an air stream, through the nozzle to the fan chamber, and from that fan chamber to the cleaner filter in which the air is separated from the suspended foreign matter. The air stream before entering the nozzle proper passes over the surface covering undergoing cleaning to remove therefrom the foreign material. This air cleaning operation is increased in effectiveness by the provision in the suction cleaner of surface-agitating means. Such agitating means preferably comprise a rotating member including flexible brush elements which brush the surface covering to dislodge embedded foreign material and straighten the nap of the pile.

Continued use of the rotary agitator, however, results in wear of the brush bristles necessitating either an adjustment of the agitator relative to the cleaner or the replacement of the worn bristles by new bristles. In the suction cleaner constructed in accordance with the present invention the agitator mounting is such that the agitator can be adjusted to a plurality of positions to compensate for varying degrees of bristle wear and the relationship of the parts is such that the agitator is easily and readily removed from the cleaner when in any of its positions.

It is an object of the present invention to provide a new and improved suction cleaner. It is another object of the invention to provide a new and improved agitator mounting in a suction cleaner. A still further object of the invention is to provide a new and improved adjustable mounting for agitators in suction cleaners. A still further object is the provision in a suction cleaner of an adjustable mounting for a rotary agitator which permits of adjustment to compensate for bristle wear. A further object of the invention is the provision of an agitator adjustment in a suction cleaner which comprises cooperating parts upon the agitator and upon the supporting cleaner body which are relatively adjustable to raise and lower the agitator relative to the plane of the surface covering undergoing cleaning. These and other more specific objects will appear upon reading the following specification and claims, and upon considering in connection therewith the attached drawing to which they relate.

Referring now to the drawing in which a preferred embodiment of the invention is disclosed:

Figure 1 is a front view of a suction cleaner embodying the present invention, a transverse section being taken across the cleaner nozzle to show the agitator positioned therein;

Figure 2 is a section upon the line 2—2 of Figure 1 and shows the agitator-supporting construction at one end of the nozzle;

Figure 3 is a perspective view of the agitator end plate removed;

Figure 4 is an end view of the agitator removed from the cleaner nozzle;

Figure 5 is a side view of the agitator and includes a partial section upon the line 5—5 of Figure 4.

The present invention is illustrated in the drawing in a suction cleaner the body of which includes a motor casing 1 which houses an unshown driving motor. The motor casing is positioned immediately above a fan chamber 2 which houses a suction-creating fan 3 which is driven by the unshown motor within casing 1. A nozzle 4 is positioned forwardly of fan chamber 2 and, in a manner well known in the suction cleaner art, is interiorly connected to the fan chamber whereby the high speed rotation of the fan 3 creates a suction within nozzle 4. The nozzle includes a front surface-contacting lip 5 and a rear surface-contacting lip 6 and these elements, together with the remainder of the cleaner body, are movably supported upon the surface undergoing cleaning by means of front wheels, indicated by the reference characters 7, 7, and by rear wheels, indicated by the reference characters 8, 8. As in the usual suction cleaner, a handle is pivotally connected to the cleaner body. The lower bail arms of the handle are indicated by the reference characters 9,9. By the handle the operator may propel the cleaner over the surface covering undergoing cleaning in a manner common to suction cleaners.

Within the cleaner nozzle 4 is positioned a rotary agitator 10 which is supported by the nozzle end walls by means hereinafter to be fully described, and which is rotated by a power-transmitting belt 11 driven by the unshown motor at a point below the suction-creating fan 3 in a

manner well known in the art. Agitator 10 includes a cylindrical body upon the surface of which are removably positioned brush elements 12,12, etc., each brush element including a back which is removably secured to the agitator body 10, as by screws 13,13, and flexible bristle elements which extend beyond the periphery of the cylindrical body.

The cylindrical body of the agitator is closed at each end by a plate 14, one of which is illustrated in Figure 5, and in the central bore of each of these end plates is carried a bearing 15 in the inner race of which is mounted the end of the stationary agitator-supporting shaft 16. The ends of shaft 16 are threaded outside the bearing 15 and upon each threaded end is secured a thread guard member 17 which overlies the end of the cylindrical body to provide a protecting labyrinth for the bearing 15. The presence of the thread guard 17 at the end of the agitator prevents the accumulation upon the bearing 15 of dirt and threads and other foreign material.

Permanently attached to the outer face of thread guard 17 so as to form an integral unit therewith is an hexagonal support member 18 which is formed at its periphery with outwardly or axially extending side walls. Hexagonal support member 18 is eccentrically positioned on thread guard 17 and the relationship is such that the angles in the hexagonal periphery of the support as well as the side walls are positioned at unequal distances from the central bore 19 of the thread guard. As is clearly illustrated in Figure 3, the hexagonal angular corners of the support 18 which are radially adjacent the numerals 1, 2 and 3 are spaced from the central opening of thread guard 17 by varying distances, the corner opposite point 1 being the greatest while the corner opposite point 3 is the smallest.

The central opening 19, which is common to the thread guard 17 and the support 18, is flat upon one side and correspondingly the supporting shaft 16 is also made flat on one side at its end for the purpose of preventing relative rotation between the unit comprising the guard and the support when it is positioned upon the shaft. An internally threaded securing nut 20 seats upon the threaded end of shaft 16 and prevents the longitudinal displacement of the thread guard and the support.

Each end wall of the nozzle is internally provided with a downwardly opening agitator-carrying seat 25 which is shaped to conform on four faces to the hexagonal support 18 of the agitator. As is clearly shown in Figure 2, support 18 fits within seat 25 with one of the angles of the hexagonal facing downwardly and one upwardly. To prevent the downward displacement of each end of the agitator when the support 18 at that end is positioned within its seat 25 there is provided for each seat 25 a spring locking member 26 which is freely pivoted at 27 immediately over the seat 25. Each latch 26 extends downwardly at the side of the seat, is curbed thereunder, and is there formed with an appropriate V-notch 28 and a suitable handle portion 29. Spring lock 26 is adapted to be pivoted between the full and the dotted line positions illustrated in Figure 2 by the manual exertion of a force upon the handle portion 29.

With the hexagonal support 18 in place under the seat 25 the V-notch 28 underlies the downwardly pointed angle of the support in a seating relationship which prevents unintentional displacement of the spring. The spring force in the latch urges the support upwardly so that it centers properly and truly within the downwardly facing angle at the top of the seat 25. The relationship is such that this upwardly exerted force of the spring 26 upon the support 18 functions always to align properly the support 18 within its seat 25 and the V-notch 28 of the spring 26 automatically centers the spring relative to the support.

The removal of the agitator from the nozzle is readily accomplished. It is only necessary to pivot the securing latch 26 rearwardly from the full line to the dotted line positions, as indicated in Figure 2. Thereafter the agitator can be downwardly displaced through the nozzle mouth.

With a new agitator within the cleaner nozzle and the brush bristles extended to their full new length the support 18 is positioned in its seat 25 so that the numeral 1 is uppermost, for in that relationship the agitator is in its highest position within the nozzle. After being used the effective bristle length is decreased and the agitator should then be removed, as above described, and reinserted with the numeral 2 uppermost in the seat 25. This angular change in the support position results in the downward displacement of the shaft 16 and the entire agitator within the nozzle, and accordingly the brush bristles extend further down into the nozzle mouth and compensation for decreased bristle extension is obtained. Upon further wear the agitator can again be removed and the position 3 placed uppermost within the nozzle. The manual operation of removing and reinserting the agitator is simple and the results are positive.

I claim:

In a suction cleaner, a body, a downwardly opening seat including a downwardly facing angle, a rotary agitator including a multi-angled support at its end, the angles of said support being spaced at varying radial distances from the axis of agitator rotation, said seat being adapted to seat said angles selectively to raise or lower the agitator relative to the body and with one of said angles directed downwardly, and a spring lock pivoted to said body above the axis of said agitator and comprising a spring element extended from its pivot point down beside said support and then thereunder where it is formed with an angle-seating conformation and a handle portion, said lock being manually movable between an inoperative position in which it is positioned entirely at the side of said support and an operative position in which the downwardly directed angle on said support seats within said angle-seating conformation on said lock and stresses said spring element, said lock being additionally stressed as it moves into and from said operative position whereby accidental displacement of said lock is prohibited.

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