Feb. 9, 1943. C. H. TAYLOR 2,310,267

SUCTION CLEANER APPARATUS

Filed June 7, 1940

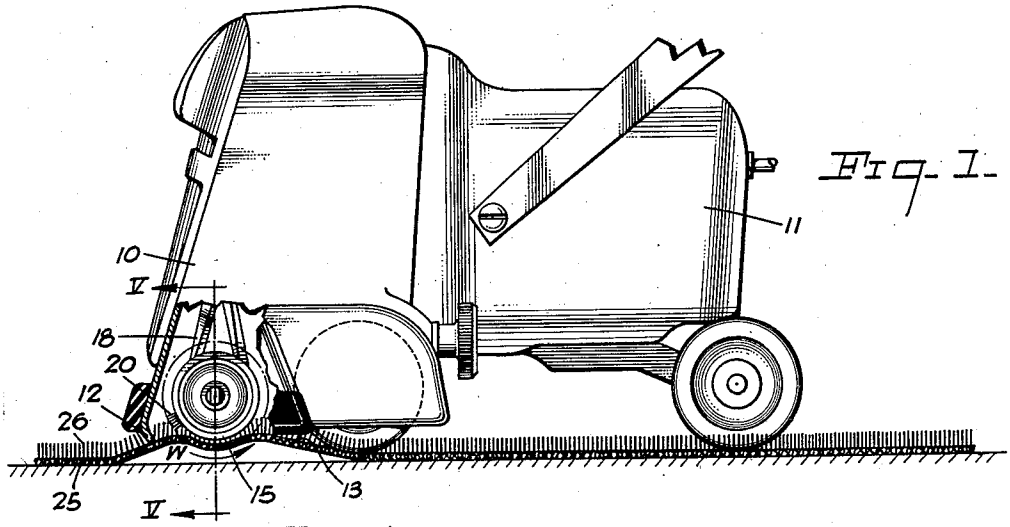


Fig. 1.

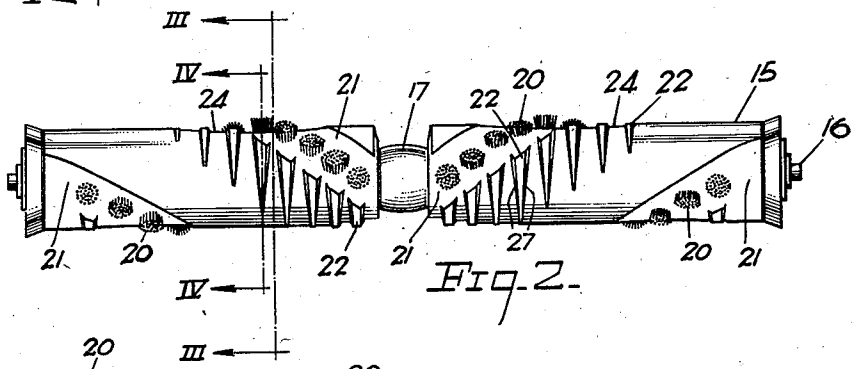


Fig. 2.

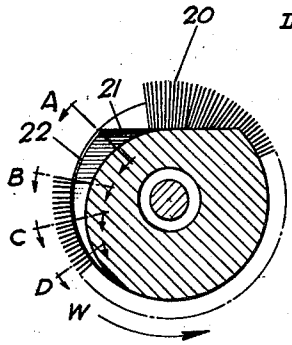


Fig. 3.

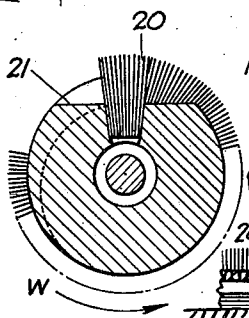


Fig. 4.

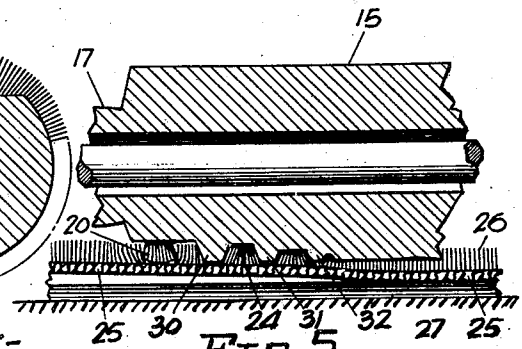


Fig. 5.

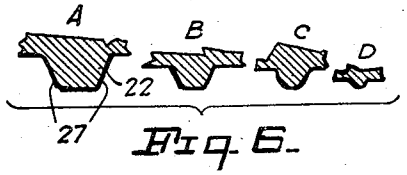


Fig. 6.

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SUCTION CLEANER APPARATUS

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13 Claims. (Cl. 15—6)

My invention relates to suction cleaning apparatus and has for an object to provide improved apparatus of the character set forth.

An object is to obtain more thorough cleaning of the carpet.

A further object is to extend the sweeping action of the brush down into the carpet pile or nap below the surface.

A further object is to provide a brush roll which will permit the cleaning air currents to have unhindered access to the area between the adjacent tufts of pile or nap of the carpet.

In accordance with my invention, I provide a brush roll having means for parting or separating the carpet pile and having tufts disposed to enter the grooves thus formed between the separated pile and effect a sweeping action on the pile below the top thereof.

These and other objects are effected by my 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 parts broken away to show the brush roll;

Fig. 2 is an elevation of my improved brush roll per se;

Fig. 3 is a section taken on line III—III of Fig. 2;

Fig. 4 is a section taken on line IV—IV of Fig. 2;

Fig. 5 is a partial longitudinal section taken on line V—V of Fig. 1; and,

Fig. 6 comprises a series of detail cross sections of a single parter taken on lines AA, BB, CC, and DD, of Fig. 3.

Referring to the drawing in detail, I show, in Fig. 1, a suction cleaner in which my novel brush roll is embodied. The suction cleaner may be of any suitable type and generally comprises a nozzle casing 10 and motor housing 11. The nozzle casing has an inlet opening which is defined by lips 12 and 13.

Referring to Fig. 2, I show a brush roll which represents the preferred embodiment of my invention. It is rotatably mounted in any suitable manner in the nozzle of the cleaner shown in Fig. 1; for example, it may be mounted upon a non-rotatable shaft 16 which extends beyond the ends thereof and which is held in the nozzle in any suitable manner. The brush roll is rotated by the cleaner motor through a belt 18, which engages a pulley 17 formed on the brush roll intermediate its ends.

The brush roll includes a cylindrical body 15, tufts of bristles 20 mounted thereon, and parters 22, disposed in line with the tufts of bristles, for separating the nap or pile of a carpet.

The tufts of bristles 20 are set in a flat surface 21 on the body 15 of the brush roll. They are preferably mounted in a spiral line upon the body 15, either in a single continuous spiral or several separate spirals. I have shown them mounted in two separate spirals which extend from the pulley 17 toward the opposite ends of the brush roll.

In the present embodiment, parters 22 are formed integrally with the body 15 by removing the material from the area indicated by reference numeral 24. As shown on the drawing, Fig. 2, a parter is formed adjacent to and directly in line with each tuft of bristles 20. The parters 22 extend partially around the body 15 in a generally circumferential direction and terminate adjacent the tufts of bristles 20.

The sides 27 of the parters 22 diverge as they extend from the point where they begin on the body 15, and form substantially a V on the surface of the body 15. This shape of the parters enables them to more readily wedge their way in between adjacent tufts of nap or pile on a carpet. As seen from the drawing, Fig. 6, the parters 22 progressively increase in height and width from the point where they begin on the body 15 to the point where they terminate adjacent the tufts of bristles 20. They are substantially triangular shaped in cross section at the point where they begin, and gradually assume the shape of an isosceles trapezoid in cross section as they approach the tufts of bristles 20.

Referring again to Fig. 2 of the drawing, it will be seen that the parters 22 are formed in substantially a spiral about the body 15. By so distributing the parters, substantially no unbalancing of the brush roll is effected by removing the material from between adjacent parters. Consequently, no counterweights are required to dynamically balance the brush roll.

In the operation of a suction cleaner equipped with my improved brush roll upon a carpet 25 having tufts of pile or nap 26, the portion of the carpet between the lips 12 and 13 of the suction cleaner nozzle, see Fig. 1, will be drawn slightly into the nozzle, and into contact with the brush roll, due to the reduced pressure in the nozzle. The brush roll will be rotated in the direction of the arrow W in Figs. 1, 3, and 4 and the triangular shaped parters 22 will wedge their way between the adjacent tufts of pile or nap 26 on the carpet 25. This wedging ac-

tion of the parters 22 will force the pile or nap to bunch up in the grooves 24 between the adjacent parters, as shown in Fig. 5. The tufts of bristles 20, being adjacent to and directly in line with the parters 22, will sweep through the grooves in the nap or pile made by the parters 22, and will loosen the dirt from between the adjacent tufts of pile or nap, and from near the base of the carpet, making possible its removal by suction.

The cleaning action of my novel brush roll is further illustrated in the longitudinal section of Fig. 5, in which three parters, 30, 31, and 32, and a tuft of bristles 20 are seen. Since the parters are arranged in spiral form on the brush roll, the plane on which the section is taken cuts through the first parter 30 at a point near its forward or entering end, through the next parter 31 adjacent the middle thereof and through the last parter 32 adjacent the rear or leaving end. Accordingly, the three parters 30, 31, and 32 appear successively greater in cross section and have produced successively greater grooves in the pile. The tuft of bristles 20 has entered the groove in the pile made by the parter which is disposed to the left of the parter 32 and which has just left the plane of the section. In the continued rotation of this brush roll, the tufts disposed in alignment with the parters 30, 31, and 32 will successively enter the grooves made by these parters.

It will be observed from Fig. 5 that with the partners 30, 31, and 32 in the positions shown, the carpet 25 slopes downwardly to the right and upwardly to the left. This inclination of the carpet is caused by the tufts of nap 26 on the left being bunched in the grooves 24 which permits the left side of the carpet to be raised higher from the floor than the right side. In the continued rotation of the brush roll the carpet 25 would gradually assume an upwardly slope to the right and a downwardly slope to the left. This cycle is repeated during each revolution of the brush roll.

From the above description, it will be seen that I have provided an improved brush roll for suction cleaners which enables the sweeping action of the brush to extend down below the surface of the carpet pile or nap.

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 brush roll for suction cleaners comprising a revoluble-mounted body, a plurality of oblong tapered elements on said body, said elements having a substantially greater circumferential than axial extent and being adapted to enter between adjacent tufts of nap or pile of the carpet or rug being cleaned as the brush roll rotates and form a groove, and brush means carried by said body and located adjacent the leaving ends of said elements so that immediately after each element leaves the carpet the brush enters the groove made in the nap or pile by the element and sweeps through the same to loosen dirt or litter disposed below the surface of the carpet.

2. A brush roll for suction cleaners comprising a revolubly mounted body, tapered parters provided on said body to separate adjacent tufts of pile to form a groove, and tufts of bristles disposed in line with and adjacent the leaving ends of said parters in such position as to enter the grooves formed by said parters.

3. A brush roll for suction cleaners comprising a revoluble-mounted body, a plurality of oblong tapered elements arranged in spiral formation on said body, said elements having a substantially greater circumferential than axial extent and being adapted to enter between adjacent tufts of nap or pile of the carpet or rug being cleaned as the brush roll rotates and form a groove, and brush means carried by said body and arranged in a spiral formation adjacent the leaving ends of said elements so that immediately after each element leaves the carpet the brush enters the groove made in the nap or pile by the element and sweeps through the same to loosen dirt or litter disposed below the surface of the carpet.

4. A brush roll for suction cleaners comprising a revoluble-mounted substantially cylindrical body, said cylindrical body having a plurality of oblong tapered elements formed therein by cutting into the cylindrical surface of the body and removing the material between adjacent elements, said elements having a substantially greater circumferential than axial extent and being adapted to enter between adjacent tufts of nap or pile of the carpet or rug being cleaned as the brush roll rotates and form a groove, and brush means carried by said body and located adjacent the leaving ends of said oblong elements so that immediately after each element leaves the carpet the brush sweeps through the groove made in the nap or pile by the leaving element to loosen dirt or litter disposed below the surface of the carpet.

5. A brush roll for suction cleaners comprising a revolubly mounted body, tufts of bristles mounted spirally upon said body, said body being provided with a plurality of parters, said parters extending from adjacent said tufts of bristles around said body in a generally circumferential direction, said parters being arranged in spiral formation about said body, said tufts of bristles being disposed adjacent and in line with the leaving end of said parters.

6. A brush roll for suction cleaners comprising a revolubly mounted body having tufts of bristles mounted thereon, said body being provided with a plurality of parters so positioned that they immediately precede said tufts of bristles in the direction of rotation of said brush roll, each of said parters being substantially V-shaped on the surface of said body, said parters being disposed in alignment with said tufts of bristles.

7. A brush roll for suction cleaners comprising a revolubly mounted body having tufts of bristles mounted thereon, said body being provided with a plurality of parters so positioned that the parters immediately precede the tufts of bristles in the direction of rotation of the brush roll, said parters having transverse cross-section which tapers in a direction away from the center of the brush roll and said parters being disposed in alignment with said tufts of bristles.

8. A brush roll for suction cleaners comprising a revolubly mounted body having tufts of bristles mounted thereon, said body being provided with a plurality of parters so positioned that the parters immediately precede the tufts

of bristles in the direction of rotation of the brush roll, said parters having a substantially greater circumferential extent than axial extent and terminating adjacent and in line with said tufts of bristles, said parters progressively increasing in height as they approach said tufts of bristles.

9. A brush roll for suction cleaners comprising a revolubly mounted body having tufts of bristles mounted thereon, said body being provided with a plurality of parters so positioned that the parters immediately precede the tufts of bristles in the direction of rotation of the brush roll, said parters having a substantially greater circumferential extent than axial extent and terminating adjacent and in alignment with said tufts of bristles, said parters progressively increasing in width as they approach said tufts of bristles.

10. A brush roll for suction cleaners comprisprising a revolubly mounted body having tufts of bristles mounted thereon, said body being provided with a plurality of parters located so that the parters immediately precede the tufts of bristles in the direction of rotation of the brush roll, each of said parters being in line with a tuft of bristles, said parters have a substantially greater circumferential extent than axial extent and progressively increasing in width as they extend around said body.

11. A brush roll for suction cleaners comprising a revolubly mounted body having tufts of bristles mounted thereon, said body being provided with a plurality of parters tapered in transverse cross-section in a direction away from the center of the brush roll, said parters having a substantially greater circumferential extent than axial extent and terminating adjacent and in alignment with said tufts of bristles in such position that the parters immediately precede the tufts of bristles in the direction of rotation of the brush roll, said parters progressively increasing in height and width as they approach said tufts of bristles.

12. A brush roll for suction cleaners comprising a revolubly mounted body having tufts of bristles mounted thereon, said body being provided with a plurality of parters so positioned that the parters immediately precede the tufts of bristles in the direction of rotation of the brush roll, each of said parters being in line with a tuft of bristles, said parters having a substantially greater circumferential extent than axial extent, said parters progressively increasing in height and width as they extend around said body.

13. A brush roll for suction cleaners comprising a revolubly-mounted body, tufts of bristles mounted on said body for sweeping the nap or pile of a carpet, parters provided on said body, said parters being of such shape as to wedge into the nap or pile of the carpet or rug being cleaned and form a groove, said parters being arranged so that immediately after each parter leaves the carpet a tuft of bristles enters the groove made in the nap or pile by the parter and sweeps through the same to loosen dirt or litter disposed below the surface of the carpet.

CHARLES H. TAYLOR.