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2,334,732

SUCTION CLEANING APPARATUS

Filed Jan. 25, 1940

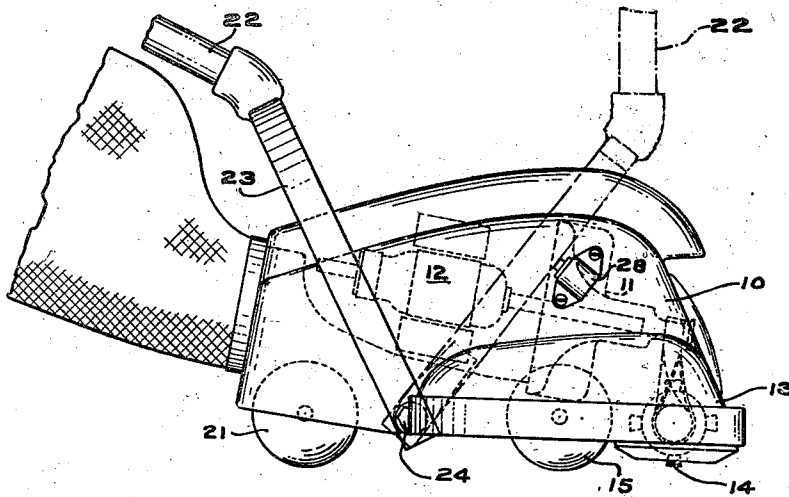


FIG. 1.

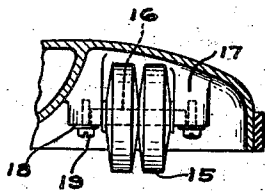


FIG. 3.

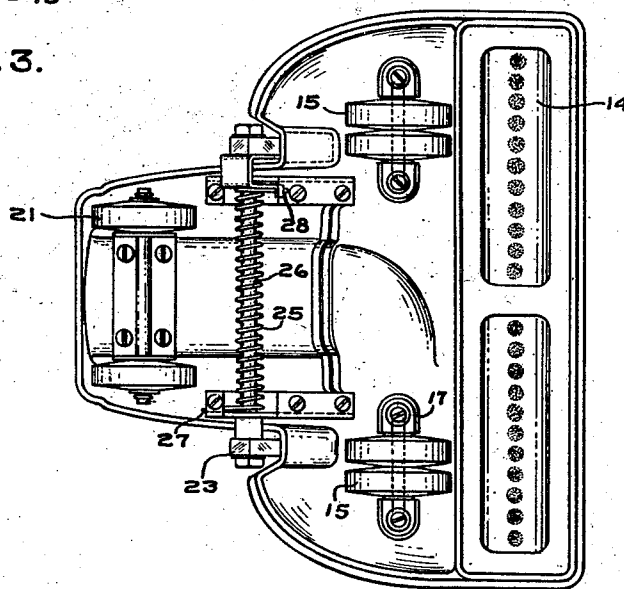


FIG. 2.

WITNESSES:

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SUCTION CLEANING APPARATUS

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Application January 25, 1940, Serial No. 315,464

6 Claims. (Cl. 15—16)

My invention relates to suction cleaning apparatus, more particularly to a suction cleaner for textile floor coverings (carpets and rugs), and it has for an object to provide improved apparatus of the character set forth.

A further object is to provide a cleaner which inherently maintains the nozzle of the cleaner in proper relation to the surface of the floor covering being cleaned without necessitating manual adjustment for different thicknesses of floor covering; a more particular object being to eliminate bouncing in such a cleaner.

Another object is to simplify manufacture of the wheels.

It has heretofore been proposed to increase the width of the front wheels of the cleaner in order that they may ride substantially on the surface of the floor covering, particularly heavy carpets or rugs. I have found, however, that when the width of the wheels is increased beyond a certain value, about $\frac{5}{8}$ inch, the cleaner bounces over a heavy carpet or rug. This is particularly true when the cleaner is run perpendicular to the rows of pile of the carpet. The bouncing is probably due to the fact that the wide wheels push the pile forwardly into a bunch. The wheels then ride up on the bunched pile and bounce down after passing over the same.

In accordance with my invention, I provide a plurality of wheels at the front of the nozzle on each side of the longitudinal centerline. Each wheel has a tread not more than $\frac{5}{8}$ inch wide. In the present embodiment, a tread width of $\frac{3}{8}$ inch is employed. The wheels are arranged so as to provide in operation a space of at least $\frac{1}{8}$ inch between the treads of adjacent wheels. Apparently a wheel of such width separates the pile and moves it to the opposite sides, the wheel passing through the gap formed between the pile. The space between the adjacent wheels receives the pile pushed aside by the wheels. Accordingly, the pile is not bunched ahead of the wheel and bouncing is avoided.

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 in accordance with my invention;

Fig. 2 is a bottom plan view thereof; and,

Fig. 3 is a detail sectional view.

Referring to the drawing in detail, I show a cleaner body 10 in which there is mounted a fan

11 and a motor 12 for driving the same. The cleaner body is also formed with a nozzle 13 communicating with the inlet of the fan 11, and a brush roll 14 driven by the motor 12 may be provided in the nozzle 13 in a well-known manner.

The body 10 is provided with two pairs of front wheels 15 disposed adjacent and just rearwardly of the nozzle 13 and on opposite sides of the longitudinal centerline of the cleaner. Each pair of front wheels 15 may be formed as shown on Figs. 2 and 3 and mounted on a spindle 16, the ends of which are received in recesses formed in projections 17 and retained therein by washers 18 and tap screws 19. The cleaner 10 is also provided with two rear wheels 21 mounted in axial alignment on opposite sides of the longitudinal centerline, as shown in Fig. 2.

In accordance with the present invention, each of the wheels 15 has a tread not greater than $\frac{5}{8}$ inch. Preferably, the wheels 15 and 21 are identical, in order to simplify manufacture, and have a tread $\frac{5}{8}$ inch wide. The front wheels 15 of each pair are also arranged so as to provide a space of at least $\frac{1}{8}$ inch between the treads of the wheels. This may be done by forming the treads narrower than the central portions of the wheels as clearly shown in Figs. 2 and 3.

A handle 22, formed with a fork 23 at its lower end, is pivoted to the cleaner body by means of a shaft 26, on a horizontal axis indicated at 24 and extending parallel to the axes of the front and rear wheels. The axis 24 is preferably disposed in or slightly below the plane including the axes of the front and the rear wheels, and also preferably slightly rearwardly of the midpoint therebetween.

A spring 25 is provided to counterbalance the weight of the handle 22. In the present embodiment, the spring 25 is a helical or torsion spring wound about the shaft 26 to which the handle fork 23 is connected. One end of the spring 25 is fixed relative to the cleaner body at 27 and the other end biases the lever at 28. The action of the spring is to bias the handle forwardly, or in clockwise direction, as seen in Fig. 1, relative to the cleaner body 10.

An electric switch 28 is mounted on the body 10 in such position as to be engaged by the handle 22 when in its foremost position. This switch is adapted to open the electric circuit to the motor 12 when it is thus engaged by the handle or its fork 23. For simplicity of illustration, I have shown the switch 28 as mounted on the exterior of the cleaner body 10, but it will be apparent that

any arrangement may be used whereby the switch is contacted and opened by some part movable with the handle when the handle is moved to the forwardmost position.

To operate the cleaner, the handle 22 is engaged and moved rearwardly to the full line position indicated on Fig. 1. The cleaner is then moved back and forth by means of the handle 22 over the carpet or other floor covering to be cleaned. Inasmuch as there are twice as many front wheels as there are rear wheels, the weight per unit area of the tread that bears on the floor covering is less for the front wheels. Also, the torsion spring exerting a turning moment between the handle and the cleaner body will tend to tilt the cleaner body rearwardly or counterclockwise as seen in Fig. 1. This biasing tends to shift the weight from the front wheels to the rear wheels, thereby further reducing the weight per unit area of the tread of the front wheels. Accordingly, the rear wheels will sink into the carpet to a greater degree, while the front wheels will tend to ride over the surface of the carpet or floor covering, thereby maintaining the nozzle in proper relation to such surface. This action is particularly desirable when cleaning heavy rugs.

As stated above, I find that the arrangement of pairs of spaced wheels as shown and described overcomes the bouncing encountered in cleaners heretofore proposed in which front wheels of greater width than $\frac{5}{8}$ inch were used.

The provision of a switch 28 is of particular importance in connection with the present cleaner in that when the handle 22 is released, the cleaner tends to tilt forwardly or in clockwise direction as seen in Fig. 1. This means that the nozzle 13 moves downwardly and if the cleaner is left on a heavy carpet, the brush roll wears the carpet excessively, producing what is called a "brush burn." By the provision of the switch 28, operation of the motor 12 is terminated and the possibility of such a brush burn is eliminated.

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 comprising a plurality of rear wheels mounted on the rear of the cleaner, and a pair of front wheels on the front of the cleaner on each side of the longitudinal center of the cleaner in permanent coaxial relation to the front of the cleaner, said front wheels having treads not greater than $\frac{5}{8}$ of an inch in width and being spaced at least $\frac{1}{8}$ of an inch apart, the cleaner being constructed and arranged so that the loading of the front wheels per unit area of contact with the supporting surface is sufficiently low so that said front wheels ride on the carpet near the surface thereof and maintain the nozzle in proper cleaning relation to said surface.

2. A suction cleaner having a suction nozzle, a plurality of pairs of front wheels disposed adjacent said nozzle and mounted in fixed translatable relation to said suction nozzle, the tread of each wheel being not more than $\frac{5}{8}$ of an inch in width and the treads of each pair of front wheels being spaced at least $\frac{1}{8}$ of an inch apart, the cleaner being constructed and arranged so that the loading on said front wheels per unit area of contact with the supporting surface is sufficiently low so that said front wheels support said suction nozzle without undue sinking into the carpet nap so as to maintain the nozzle in proper cleaning relation to the surface of the carpet.

3. A suction cleaner as set forth in claim 2 and further comprising rear wheels mounted at the rear end of the cleaner in fixed translatable relation to said suction nozzle.

4. A suction cleaner as set forth in claim 1 wherein the treads of the front wheels are $\frac{5}{8}$ of an inch in width.

5. A suction cleaner as set forth in claim 2 wherein the treads of the front wheels are $\frac{5}{8}$ of an inch in width.

6. A suction cleaner as set forth in claim 2, wherein the treads of the front wheels are $\frac{5}{8}$ of an inch in width, and which further comprises rear wheels mounted at the rear end of the cleaner in fixed translatable relation to said suction nozzle.

CHARLES H. TAYLOR.

CERTIFICATE OF CORRECTION.

Patent No. 2,334,732.

November 23, 1943.

CHARLES H. TAYLOR.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, line 37, after "wheels." insert the following sentence:

-- I find that such construction substantially overcomes the bouncing referred to. --

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of January, A. D. 1944.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.