March 29, 1932. D. G. SMELLIE 1,851,651

SUCTION CLEANER

Filed Oct. 15, 1927

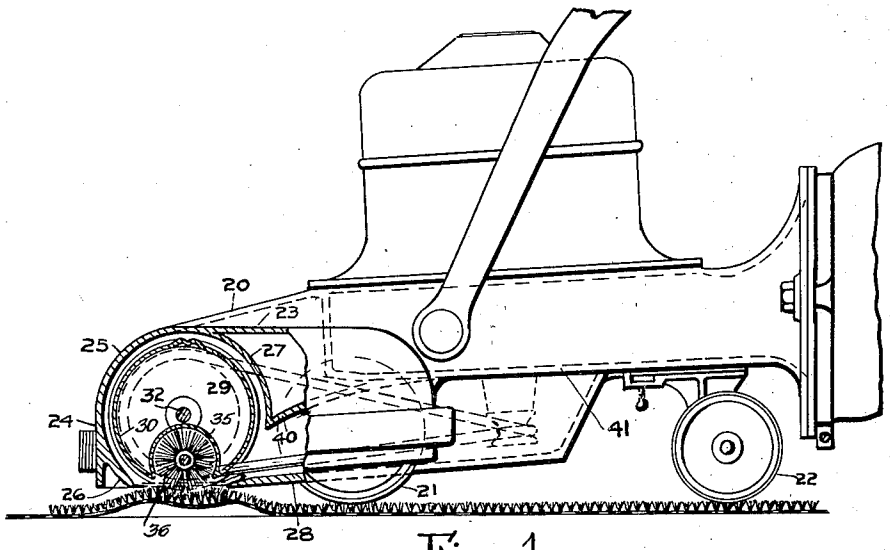

Fig. 1

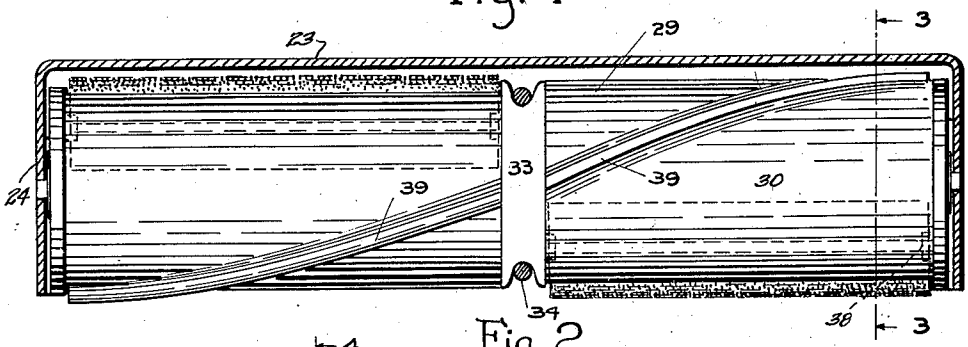

Fig. 2.

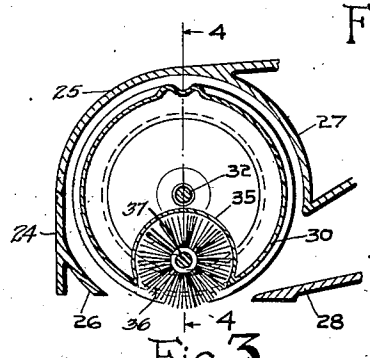

Fig. 3.

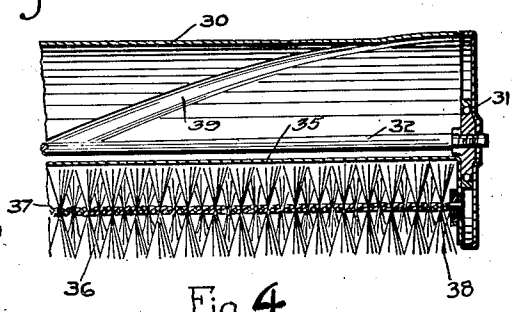

Fig. 4.

INVENTOR.

Donald G. Smellie

BY Harry S. Duarce

ATTORNEY.

Patented Mar. 29, 1932 1,851,651

UNITED STATES PATENT OFFICE

DONALD G. SMELLIE, OF CANTON, OHIO, ASSIGNOR TO THE HOOVER COMPANY, A CORPORATION OF OHIO

SUCTION CLEANER

Application filed October 15, 1927. Serial No. 226,285.

This invention relates to suction cleaners in general and particularly to agitating elements which are mounted in the suction nozzle of the cleaner for agitating a carpet to remove and dislodge any dirt which may be imbedded therein.

The primary object of this invention is to provide an improved and superior form of agitator member in connection with a suction cleaner.

A further object is to provide an agitator member having a brush portion so constructed that wear on a fabric surface to be cleaned may be reduced to the minimum.

An additional object of the invention is to provide an improved construction wherein the agitator member substantially fills the nozzle portion of the cleaner whereby the air current passing thereinto may be confined to produce the best cleaning results and provision is made for properly maintaining the air flow velocity into the suction producing means.

Other objects and advantages of the invention will become apparent upon reading the following specification and considering in connection therewith the accompanying drawings.

The invention is fully illustrated in the accompanying drawings, wherein

Figure 1 shows the side elevation of a suction cleaner, a portion thereof being broken away;

Fig. 2 is substantially a front elevation of the agitator member;

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

Fig. 4 is a partial section on line 4—4 of Fig. 3.

In the drawings there is illustrated a suction cleaner having a forwardly extending nozzle portion 20, the cleaner being mounted on wheels 21 and 22 in order that it may be propelled over the surface to be cleaned. It is to be noted that the wheels 21 are located entirely in the rear of the nozzle in which the agitator member is mounted and that the wheels are so positioned that the nozzle intake or mouth is a substantial distance above the surface to be cleaned. The exterior of the nozzle portion 20 of the cleaner comprises the upper straight wall 23 and the side wall 24 positioned at approximately right angles one to the other and joined by means of an arcuate portion 25. The interior of the nozzle structure is formed in part by the wall portion 26 and a portion 27, each of which is curved as shown. These curved walls 25, 26 and 27 together form a substantially cylindrical agitator housing within which the agitator is rotatably mounted.

The nozzle portion 20 is provided with a bottom opening, nozzle intake or mouth formed by the lower edge of the wall 26 and the front edge of a bottom plate 28. The outlet from the nozzle chamber lies between the lower end of the wall 27 and the front edge of the removable bottom plate 28. Air drawn into the cleaner and any dirt carried by it enters through the nozzle intake and passes out through the nozzle outlet to be disposed of in the usual manner.

Mounted in the interior of the nozzle portion 20 is an agitator unit 29 comprising a substantially cylindrical shell 30 carrying at each of its ends one portion of a bearing 31, the other portion of each bearing being on a longitudinally extending shaft 32 which is appropriately mounted in the end walls of the nozzle portion. The agitator unit 29 is provided with a centrally located pulley 33 and is driven by means of a belt 34. As is clearly shown in Fig. 1 the cylindrical shell 30 is only slightly less in diameter than the agitator housing within which it is positioned and accordingly the cross-sectional area of the two is substantially of the same magnitude.

The surface of the cylindrical shell 30 of the agitator unit 29 is interrupted, as shown, and is provided with a cylindrical re-entrant portion or channel 35. The unit is provided with two of these portions, one on each side of the pulley 33 and as shown, these re-entrant portions are offset 180 degrees circumferentially, one relative to each other. Mounted within the re-entrant portion 35 is a cylindrical brush 36 including a shaft 37 which is revolubly mounted at bearings 38

provided in the ends of each of the re-entrant portions.

The surface of the agitator unit has formed thereon, or connected thereto in some suitable manner, raised, bead-like projections 39, which function as beater elements and serve to agitate the fabric being cleaned as the agitator unit rotates.

From the bottom edge of the wall 27 a second wall 40 extends rearwardly and joins the bottom wall 41 of the fan chamber. The wall 40 and the bottom plate 28 help form a conduit leading from the agitator chamber to the fan chamber and are so shaped and positioned as to produce a conduit whose cross-sectional area is substantially constant from end to end.

It will be seen that the construction described provides means whereby on rotation of the agitator unit the brushes 36 contact the surface covering being cleaned and brush and agitate that covering. As each brush is rotatably mounted, the bristles as they contact with the surface being cleaned tend to maintain themselves radial to the brush shaft rather than bend over on contact as would be the condition were the brush non-rotatably mounted with respect to the shell 30. Due to the inertia of the brush and to the friction in the brush bearings, the brushes will not revolve freely and the result will be a combination of a flexure of the bristles, to provide a brush action, and a tendency of the bristles to push down the fabric from the nozzle mouth as the brush rotates thereacross.

Due to the fact that each brush can rotate in its mounting, the bristles thereof will not merely flex and drag across the fabric surface, but as stated, they will tend to be maintained radial with respect to their shaft and thus the dragging action will be minimized due to the relative rotation between the agitator body and the brush member, and thus wear on the fabric may be maintained at a low rate. The beater elements 39 impart a positive blow to the covering upon the rotation of the agitator.

It will be readily understood that with the construction just disclosed, the contact between the fabric being cleaned and the brushes on the agitator will be partly rolling and partly sliding in character. The sliding contact will be less than with a fixed brush thereby reducing carpet wear, while at the same time the agitator will vibrate and beat from the fabric being cleaned the dirt embedded therein.

Changes may be made in the form construction and arrangement of the parts without departing from the spirit of the invention, or sacrificing any of the advantages thereof, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

I claim:—

1. A suction cleaner having a forwardly extending nozzle including an agitator housing, an agitator unit revolubly mounted in the agitator housing, the agitator being closely enclosed by the housing, the agitator unit having a substantially cylindrical re-entrant portion, and a brush member revolubly mounted in the re-entrant portion.

2. An agitator unit for suction cleaners comprising a cylindrical member having a substantially cylindrical re-entrant portion, the end walls of the re-entrant portion being provided with means for mounting a revoluble member, and a brush member mounted in the mounting means provided in the end walls of the re-entrant portion.

3. An agitating unit for suction cleaners comprising a cylindrical member having a channel therein, and a brush revolubly mounted in said channel.

4. An agitating unit for suction cleaners comprising a cylindrical member having substantially cylindrical reentrant portions, and brushes revolubly mounted in said re-entrant portions.

5. An agitating unit for suction cleaners comprising a cylindrical body having oppositely disposed channels therein, a projection mounted on said body and acting as an agitator, and brushes revolubly mounted in said channels.

6. A rotary agitator for a suction cleaner comprising a cylindrical body having a longitudinally extending channel formed therein, a revoluble brush mounted in said channel and extending beyond the periphery of said body, a projection on the surface of said body serving as an agitating element, and a pulley surface formed on said body.

Signed at Canton, in the county of Stark and State of Ohio, this 10th day of October, A. D. 1927.

DONALD G. SMELLIE.