March 8, 1932. J. F. LANGER 1,848,731

AGITATOR FOR VACUUM CLEANERS

Filed April 24, 1930

Fig. 1

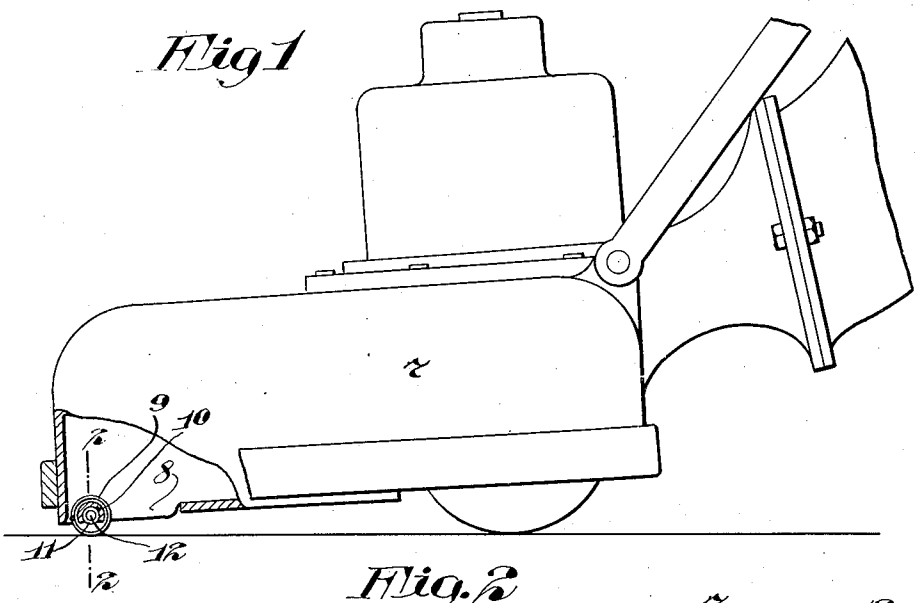


Fig. 2

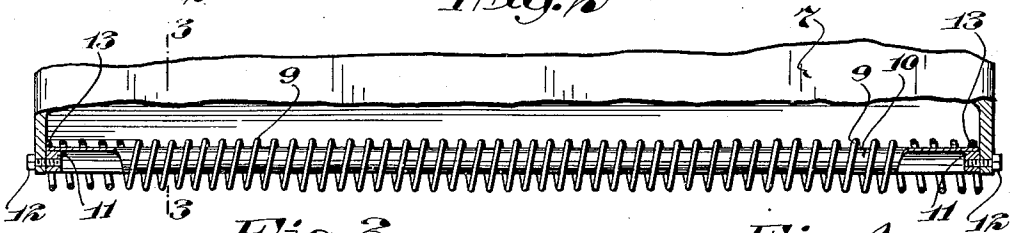


Fig. 3

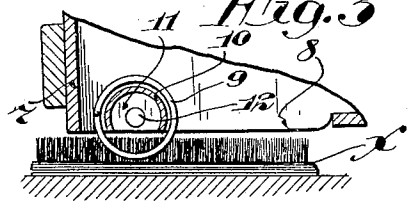


Fig. 4

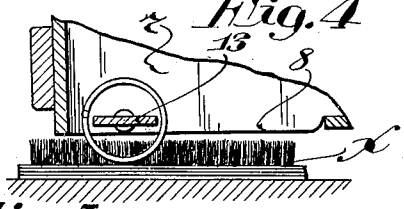


Fig. 5

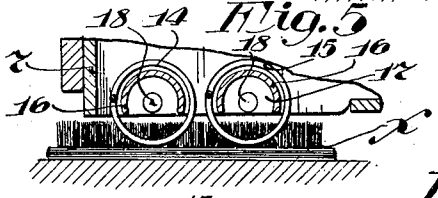
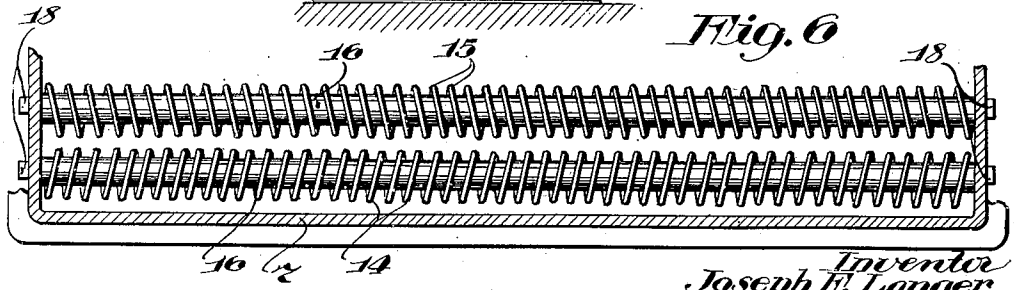


Fig. 6



Inventor
Joseph F. Langer
By his Attorneys
Merchant and Gifford

Patented Mar. 8, 1932 1,848,731

UNITED STATES PATENT OFFICE

JOSEPH F. LANGER, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF TO FRANK B. TOTZKE, OF MINNEAPOLIS, MINNESOTA

AGITATOR FOR VACUUM CLEANERS

Application filed April 24, 1930. Serial No. 446,858.

My invention relates to improvements in vacuum cleaners and the object of my improvement is to provide an extremely simple and highly efficient agitator for action on the nap of a carpet or other floor covering to facilitate the removing of the dirt and dust. A further object of the invention is to provide such an agitator that lint, strings and the like will not adhere thereto or accumulate therein.

To the above end, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a fragmentary left hand side elevation of a vacuum cleaner having one form of the invention embodied therein, some parts being in section;

Fig. 2 is a view partly in front elevation and partly in transverse vertical section taken on the line 2—2 of Fig. 1, on an enlarged scale;

Fig. 3 is a fragmentary transverse section taken on the line 3—3 of Fig. 2, on an enlarged scale;

Fig. 4 is a view corresponding to Fig. 3, but showing a slight modification;

Fig. 5 is a view corresponding to Fig. 4, but showing still another form of the invention; and

Fig. 6 is a bottom plan view of the invention, as shown in Fig. 5.

The vacuum cleaner illustrated is of the type having an electric motor, that produces the suction action, mounted directly thereon and which cleaner is indicated as an entirety by the numeral 7 with the exception of its mouth 8 at the suction intake.

Referring first to the invention, as shown in Figs. 1, 2 and 3, the agitator 9 is in the form of a long spiral spring, the convolutions of which are axially spaced and the free length of said spring is, as shown, or in other words, there is no tension on the agitator as mounted. This agitator 9 is mounted on a rigid core 10 which securely holds said agitator except for very slight radial movements in respect to said core. Said agitator 9 extends horizontally the full width of the mouth 8 at the front thereof and its convolutions extend below the bottom plane of the cleaner 7 at said mouth to project into the nap of a carpet or other floor covering X, as shown in Fig. 3. The core 10 is of metal, in cross-section is more than a semi-circle and is detachably secured at its ends to the sides of the cleaner 7 at the inner faces thereof by segmental blocks 11. These blocks 11 snugly fit in the ends of said core and are detachably secured to the sides of the cleaner 7 by screws 12 that are operable from the outside of the cleaner 7. As shown, the core 10 is entirely within the mouth 8 and its longitudinal edges are substantially flush with the bottom of the cleaner 7 at said mouth so that only the lower portions of the convolutions of the agitator 9 extend below the cleaner 7. The ends of the agitator 9 are rigidly secured to the core 10 by welding or otherwise, as indicated at 13.

As the cleaner 7 is moved over the floor covering X the convolutions of the agitator 9 pass through the nap with a combing action and separate the same at a multiplicity of laterally spaced points transversely of the cleaner 7. As the convolutions of the agitator 9, due to their pitch extend oblique to the direction of movement of the cleaner 7, they brush the nap and lay the same over both in the direction of the movement of the cleaner 7 and laterally thereof so as to expose the dust and dirt in the floor covering X to the suction action of the cleaner 7. These several different movements of the nap also loosens and frees the dust and dirt therefrom.

As the cleaner 7 is moved back and forth over the floor covering X the nap is first brushed in one direction and then in the other so that all sides thereof are exposed to the suction action of the cleaner. This combined brushing and combing action of the nap first in one direction and then in the other further loosens the dust and dirt therein so as to facilitate the cleaning of the floor covering X.

As the agitator 9 is made from a single smooth spirally wound wire, lint, strings and

the like will not adhere thereto as to bristle brushes. The invention shown in Fig. 4 is identical with that shown in Figs. 1, 2 and 3, with the exception that the core 13 is a flat metal bar having expanded ends for the screws 12. The core 13 is of such width as to securely hold the agitator 9 except for radial movements in respect thereto.

Two parallel agitators 14 and 15 set one in advance of the other, are employed in the invention as disclosed in Figs. 5 and 6 and each thereof is identical the one with the other except that they are reversely wound or, in other words, the convolutions of one agitator have a right hand pitch and the convolutions of the other a left hand pitch. Each agitator 14 and 15 is identical with the agitator 9 and mounted on a similar core 16 secured to the sides of the cleaner 7 by similar fastening means, to wit: blocks 17 and 18.

These reversely wound agitators 14 and 15 first move the nap in one direction and then in the other as the cleaner is moved back and forth. While the invention is shown in the intake of a vacuum cleaner it is equally well adapted for use in various attachments for such cleaners.

What I claim is:

1. The combination with a portable wheel supported suction cleaner having an intake opening, of a non-rotary agitator in said opening, said agitator comprising a spiral wire extending longitudinally through said opening with its ends anchored with respect to the cleaner and with its convolutions extending below the intake opening.

2. The structure defined in claim 1 in which the anchored ends of the agitator hold the convolutions thereof separated.

3. The structure defined in claim 1 in which the anchored ends of the agitator hold the convolutions thereof separated, and which structure further includes a core extending longitudinally through the agitator and secured to the cleaner.

4. The structure defined in claim 1 in which the anchored ends of the agitator hold the convolutions thereof separated, and which structure further includes a core extending longitudinally through the agitator and secured to the cleaner, said agitator having an internal diameter that is greater than the external diameter of the core to permit bodily lifting movement thereof with respect to the core.

5. The combination with a portable wheel supported suction cleaner having an intake opening, of two non-rotary agitators in said opening spaced one in advance of the other, each of said agitators comprising a spiral wire extending longitudinally though said opening with its ends anchored with respect to the cleaner and with its convolutions extending below the intake opening.

6. The structure defined in claim 5 in which the convolutions of one of the agitators have a right-hand pitch and in which the convolutions of the other agitator have a left-hand pitch.

7. The structure defined in claim 5 which further includes a core extending longitudinally through each of the agitators and secured to the cleaner.

In testimony whereof I affix my signature.

JOSEPH F. LANGER.