H. H. HARROLD.

VACUUM CLEANER.

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1,067,813.

Patented July 22, 1913.

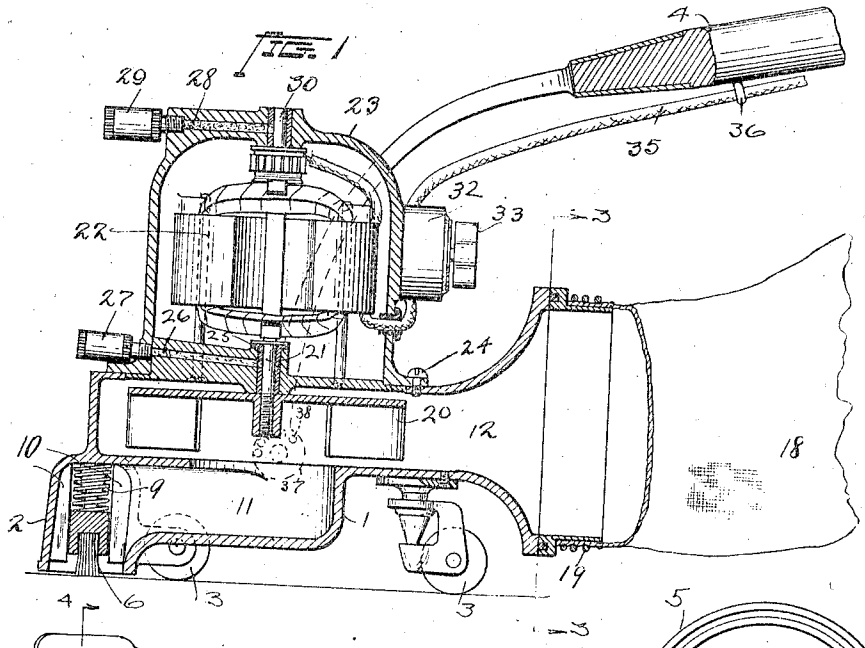


FIG. 1

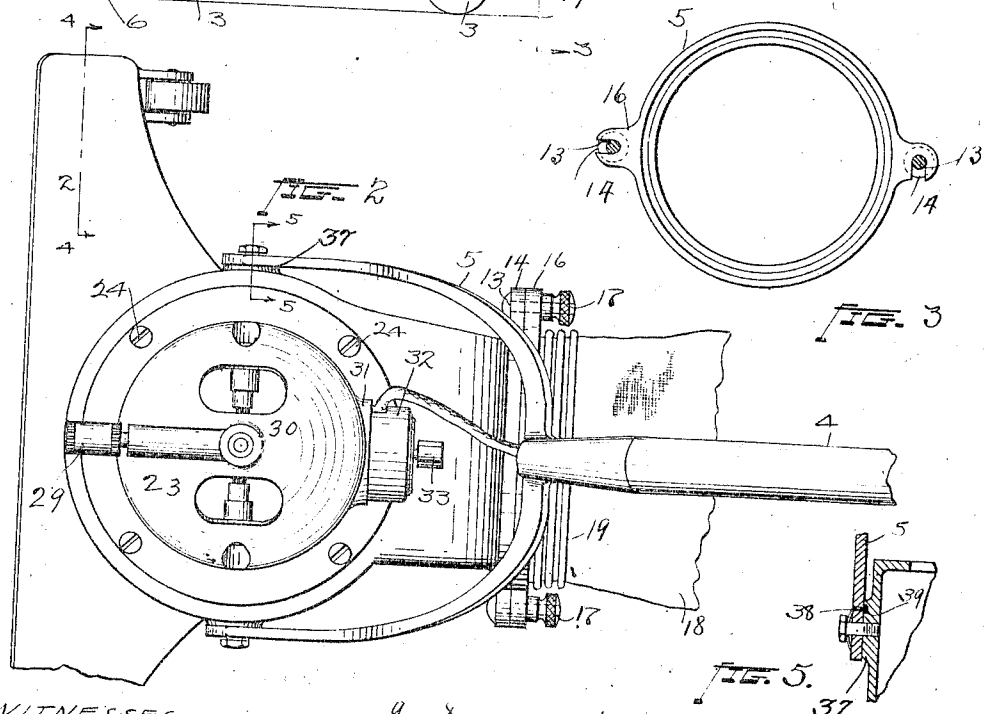


FIG. 2

FIG. 3

FIG. 5.

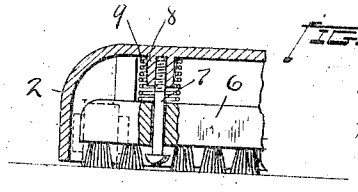


FIG. 4

WITNESSES=

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UNITED STATES PATENT OFFICE.

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VACUUM-CLEANER.

1,067,813. Specification of Letters Patent. Patented July 22, 1913.

Application filed November 16, 1912. Serial No. 731,710.

To all whom it may concern:

Be it known that I, HARMON H. HARROLD, a citizen of the United States, and a resident of Canal Dover, county of Tuscarawas, and State of Ohio, have invented a new and useful Improvement in Vacuum-Cleaners, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to a vacuum cleaner of the power driven electrical motor type.

It is the object of the invention to provide such a machine which may be readily taken apart to facilitate cleaning and repairing.

I have designed a construction which permits of the disposition of the motor in a separate chamber which is readily detachable from the main body of the machine.

Other features of my invention include the mounting of the brush in the intake nozzle and a removable head to which will be attached a dust collecting receptacle.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing: Figure 1 is a vertical central section through my device; Fig. 2 is a plan view of the same; Fig. 3 is a section on the line 3—3, Fig. 1; Fig. 4 is a partial section on the line 4—4, Fig. 2; Fig. 5 is a view showing a detail of construction, being a section of the line 5—5 of Fig. 2.

The machine consists of the main frame 1 provided with an intake nozzle 2 directed downwardly toward the surface to be cleaned. The machine is mounted upon rollers 3 which are suitably attached to the frame work. A handle 4 is attached to a yoke 5, each arm of which is attached to one side of the frame. In the intake nozzle 2 there is mounted a brush 6 upon pins 7 which are attached to downwardly extending bosses 8 upon the nozzle. Between the brush and the upper part of the nozzle casing are disposed resilient springs 9 which tend to force the brush downwardly against the surface to be cleaned. At either end of the casing are guides 10 which maintain the brush in a given position and cause it to reciprocate at right angles to the surface to be passed over.

The intake chamber extends from the nozzle rearwardly through a chamber 11, into a fan chamber 12. The rear end of the latter chamber is formed circular and is provided with two pins 13 mounted upon small ears 14. A ring, or detachable head 15, is provided with slotted extensions 16 similar to the ears 14 on the casing, and adapted to engage the pins 13. Small knurled nuts 17 may be engaged with the pins, thus retaining the detachable head in position. To the head is attached the dust receptacle or bag 18 by means of a cord 19. In the chamber 12 there is mounted a fan 20 which is engaged by a threaded shaft 21 attached to and driven by the motor 22, the latter being suitably mounted in the bell-shaped casing 23. The latter chamber is attached to the main frame by means of a number of screws 24 which may be readily removed, thus allowing the complete removal of the motor and its casing.

Bushings 25 are provided in the partition between the main frame and the motor casings for the shaft 21. A hole 26 is bored in the main frame and is adapted to be engaged by an oil cup 27 in order to lubricate the shaft 21. In the motor casing there is a second hole 28 receiving an oil cup 29 for the purpose of lubricating the upper end of the motor shaft 30. By thus providing a separate casing for the motor, it is possible to entirely prevent the entrance of dirt into the motor which would tend to injure it and shorten its life, and also to quickly and readily remove the motor casing.

Cast integrally with the motor casing is a boss 31 surrounding an aperture in which there is placed a switch holder 32 provided with a switch 33. By thus placing the switch upon the motor casing the operator may readily close or open the circuit at the machine without being obliged to go to the wall switch from which the current is taken through the wire 35. The wire 35 is held in eyelets 36 mounted upon the handle 4. The dust-collecting bag will have its unattached end supported from the handle by any suitable detachable means. Attached to the outer sides of the main frame are such disks 37, preferably formed integrally with the frame as shown, such disks being provided with recesses 38 adapted to receive a small

projection 39 on the inner side of each arm of the yoke 5. This yoke is somewhat resilient and these projections may therefore be sprung into corresponding recesses on either side of the frame, thus assisting the operator to hold the handle at a desired elevation.

The simplicity of my device will be apparent. The motor may be readily removed by means of the four screws, while the dust-collecting bag may be readily removed either from the head to which it is attached, or the latter may be removed from the main frame. When the motor is removed the fan is disengaged from the same by merely unscrewing the shaft 21. The motor is effectually protected from dust, which is necessary in this type of apparatus, by means of the separating partition between the motor casing and the main frame.

Greatly increased efficiency is obtained in my apparatus by the use of a brush mounted in the manner described. The suction produced by the fan is sufficient to draw up all dust on the surface to be cleaned, but to thoroughly remove the dust which becomes embedded in thick rugs and carpets, it is necessary to rub or brush the material. This action has been accomplished in some machines by a rotating brush. The objections to rotatable brushes are that if they merely contact the surface and roll in the direction of the machine's movement they exert no effectual brushing action, that is, they do not bend the threads in the carpet and do not stir up the dust embedded therein. By rotating the brush in a direction opposite to the machine's movement, a good cleaning action is secured, but to so drive the brush it must be geared to the wheels or motor, causing increased complication and weight. My improved brush mounting obviates both these objections. The brush is not power-driven in the sense of being connected to any rotating member, but when the machine is moved over a rug against the nap, the brush is momentarily caught or impeded, causing it to travel upwardly. The springs force it down and this action is continuous with movement of the machine. The dust embedded in the carpet is stirred up and removed by the suction mechanism.

I claim:

1. In a vacuum cleaner, the combination of a casing provided with an intake nozzle adapted to be passed over the surface to be cleaned; vertically disposed guides mounted in said casing and extending through a distance substantially equal to the height of said intake nozzle; a plurality of projections on the inner wall of said nozzle, said projections extending into the path of movement of said brush; pins mounted in said projections and slidably engaging said brush; and coiled springs disposed about said projections between the inner wall of said nozzle and said brush.

2. In a vacuum cleaner, the combination of a casing provided with a narrow elongated intake nozzle adapted to be passed over the surface to be cleaned; vertically disposed guides mounted at either end of said casing and extending through a distance substantially equal to the height of said intake nozzle; a plurality of projections extending into the path of movement of said brush; pins mounted in said projections and slidably engaging said brush; and coiled springs disposed about said projections between the inner wall of said nozzle and said brush.

Signed by me this 4th day of November, 1912.

HARMON H. HARROLD.

Attested by—
W. J. WISE,
BERT HOOBLER.