C. W. STEWART.
VACUUM CLEANER.
APPLICATION FILED MAR. 13, 1919.

1,336,760.

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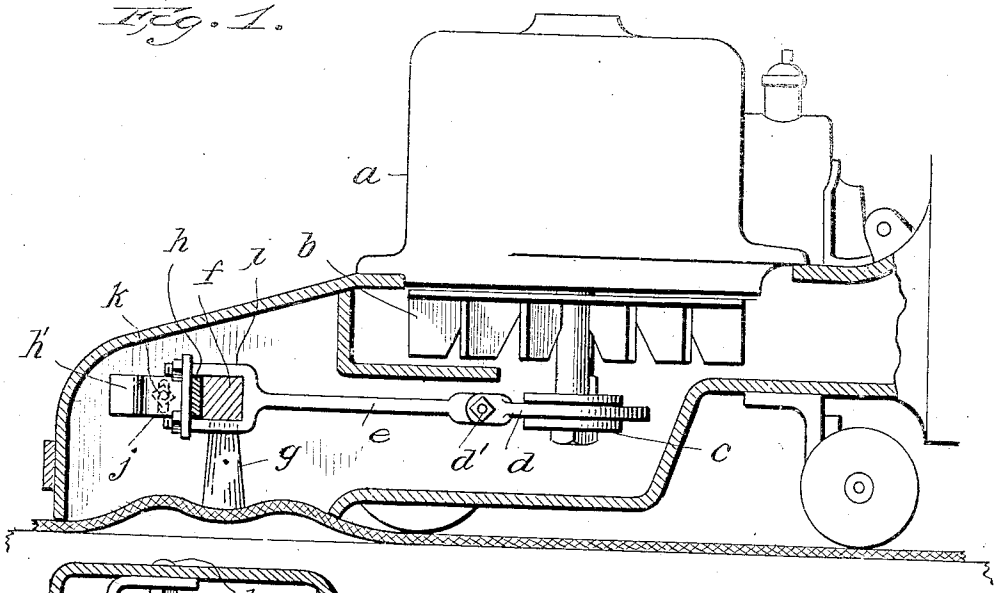
Fig. 1.



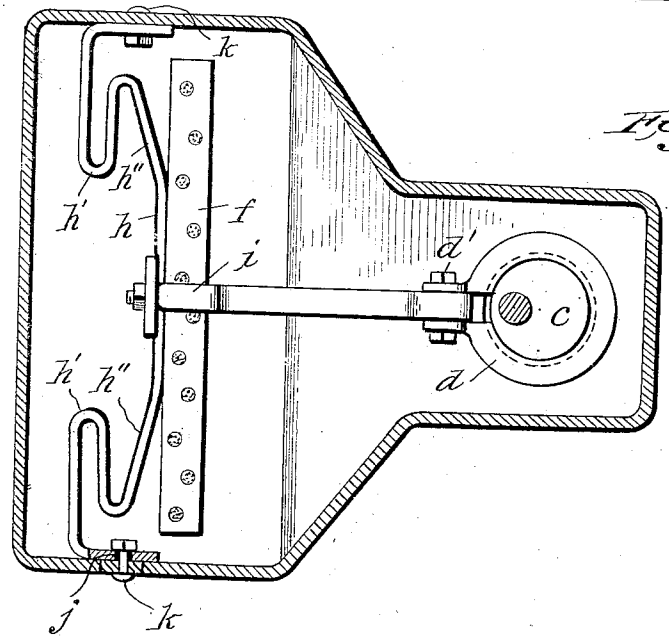


Fig. 2.

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CLAUDE W. STEWART, OF MARTINSBURG, WEST VIRGINIA.

VACUUM-CLEANER.

1,336,760. Specification of Letters Patent. Patented Apr. 13, 1920.

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To all whom it may concern:

Be it known that I, CLAUDE W. STEWART, a citizen of the United States of America, and a resident of Martinsburg, county of Berkeley, State of West Virginia, have invented certain new and useful Improvements in Vacuum-Cleaners, of which the following is a full and clear specification.

This invention has relation to that type of vacuum cleaner or sweeper, usually manually propelled, in which an electric driven motor operates a suction fan and also a brush mounted in the intake nozzle, which nozzle is adapted to rest upon or run close to the floor or floor-covering, so that as the dirt is loosened the inrushing air will carry it into the usual dust-bag; and the object of the present invention is to simplify and improve the brush mechanism, as more fully hereinafter set forth.

In the drawing—

Figure 1 is a view partly in side elevation and partly in vertical section showing my invention appiled to a well-known type of cleaner;

Fig. 2 is a horizontal sectional view.

In the drawing, *a* designates the motor which is mounted as usual on top of the suction chamber, and *b* the usual fan affixed to the shaft of the motor and running in the suction chamber. Affixed to the depending end of the motor-fan-shaft is an eccentric *c* which carries a strap *d* secured by a horizontal pivot *d'* to a pitman *e* which extends forwardly into the nozzle chamber and is rigidly attached midway the length of the brush *f* which is in the form of a bar extending approximately the full length of the intake-opening of the nozzle, the bristles *g* of the brush depending downwardly to a point on approximate level with the inlet edge of the nozzles.

The forward end of the pitman and the brush are supported entirely by a spring *h* which is located in the nozzle chamber and extends the full length of the interior thereof, the ends of the spring being rigidly attached to the interior walls of the chamber and the midlength of the spring being rigidly attached to the front face of the bar of the brush, the latter connection being secured by means of a clip *i* which is also employed for attaching the pitman rigidly to the brush. The spring is of the flat bar or plate type and is set vertically edgewise, so as to have no appreciable sag or yield in a vertical direction, and yet will yield in a fore-and-aft direction sufficiently to permit full reciprocation of the brush by means of the eccentric. Between the point of attachment of the spring to the brush and the points of attachment thereof to the nozzle walls, a sufficient fullness in the spring is provided to permit the necessary movement of the brush without binding, this fullness being provided in the present instance by bending the spring into a substantially S shape in plan, these S-shaped members being designated *h'* in the drawing. Desirably, the parts will be so proportioned and arranged that while the machine is at rest, the spring will be untensioned, with the eccentric at rest on its rear stroke, so that on the forward stroke of the eccentric the spring will be tensioned, thus storing up power which will be utilized in assisting the motor in returning the brush in its backward reciprocation, thereby contributing to easy running of the apparatus.

It will be understood that by reason of the very rapid rotation of the motor and the fact that the eccentric is affixed directly to the shaft thereof, the brush will receive a very rapid vibratory movement fore-and-aft and will thus very effectively loosen the dirt in the carpet or other floor-covering and thus insure a thorough cleaning of the floor-covering, which covering will, as is usual in this type of device, be bulged slightly into the intake nozzle by the suction action and be thus held resiliently against the rapidly vibrating brush bristles. It will be observed that by employing a vibrating brush, as distinguished from a rotary brush, and suspending the same resiliently within the suction nozzle, I reduce to a minimum the employment of friction-producing parts, it being obvious that the only parts in my device that are subject to wear are the eccentric and the strap, which parts will obviously last a great length of time and besides may be readily renewed when worn. This extreme simplicity of the brush mechanism materially reduces the work of the motor and besides renders the apparatus entirely noiseless. The spring supporting the brush not only enables me to get rid of all parts which slide or rotate upon each other in the nozzle chamber and thus are subject to wear, but also enables me to employ a type of spring which will in a material way assist the motor, since, as stated above, on the

forward stroke of the brush a considerable degree of power is stored in the spring which, when the spring tends to return to normal, will not only relieve the motor of work but will in fact assist it by a forward thrust on the pitman. The use of an eccentric is further advantageous when employed with a pitman which is supported at its forward end by a laterally-yieldable supporting member and is rigidly connected at the forward end of the brush, because of the fact that the brush body will be free to oscillate slightly fore-and-aft at its ends as the eccentric rotates, thus contributing to a thorough brushing of the floor-covering fabric. This fore-and-aft oscillation of the brush body is assisted by bending the spring at h^2 backwardly away from the front face of the brush, as is obvious.

In order to vertically adjust the brush body from time to time to compensate for wear of the bristles I vertically slot the side walls of the nozzle chamber at j and pass the spring-fastening bolts k therethrough. The pivot d' permits this adjustment to be made without binding of the parts. It will be observed that in my invention I do away with all the well-known objections to a belt-driven rotary brush and also other devices employing trains of gearing and other parts subjected to constant wear by the operation of the brush.

The nature and scope of the invention having been thus indicated and its preferred embodiment having been specifically described, what is claimed as new is:

1. In a vacuum cleaner of the type set forth, an eccentric affixed to the shaft of the fan-motor, a reciprocable brush operated by the eccentric, and resilient means for suspending the brush in the nozzle chamber, said resilient means consisting of a flat spring arranged vertically edgewise within the nozzle chamber and affixed at its ends to the walls thereof and at a point between its ends to the brush body.

2. In a vacuum cleaner of the type set forth, an eccentric affixed to the shaft of the fan-motor, a reciprocable brush operated by the eccentric, and resilient means for suspending the brush in the nozzle chamber, said resilient means being adjustably connected at its ends to the wall of the nozzle chamber to permit vertical adjustment of the brush and the resilient means.

3. In a vacuum cleaner of the type set forth, an eccentric affixed to the fan-motor-shaft, a strap engaging the eccentric, a pitman connected to the strap by a horizontal pivot, a brush attached to the forward end of the pitman in the nozzle chamber, and vertically-adjustable suspending means for the brush.

4. In a vacuum cleaner of the type set forth, an eccentric affixed to the fan-motor-shaft, a strap engaging the eccentric, a pitman connected to the strap by a horizontal pivot, a brush attached to the forward end of the pitman in the nozzle chamber, and vertically-adjustable suspending means for the brush, said suspending means consisting of a spring yieldable fore-and-aft of the machine.

5. In a vacuum sweeper of the type set forth, an eccentric on the motor-shaft in the suction chamber, a brush suspended in the nozzle chamber so as to have body movement fore-and-aft as well as a lateral oscillatory movement, and a horizontal connecting member arranged between the eccentric and the brush and supported entirely by the brush and eccentric.

In testimony whereof I hereunto affix my signature.

CLAUDE W. STEWART.