W. S. HALL.

CARPET-SWEEPER.

No. 187,374. Patented Feb. 13, 1877.

Fig. 1.

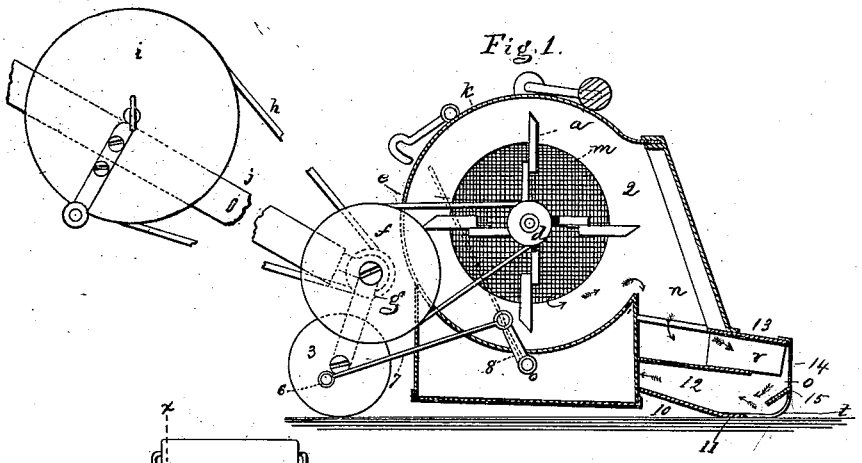


Fig. 2.

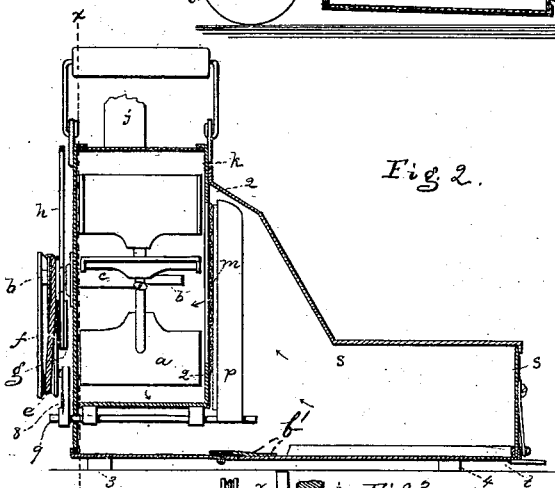
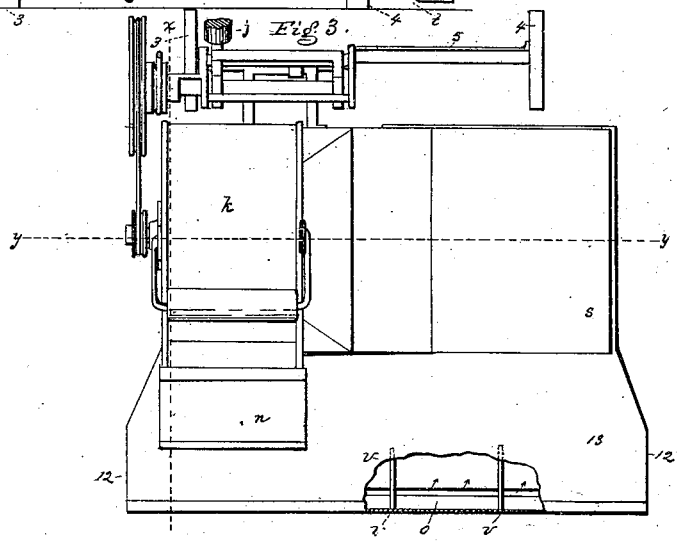


Fig. 3.



Witnesses.

L. H. Latimer.

W. J. Pratt.

Inventor.

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UNITED STATES PATENT OFFICE.

WILLIAM SMITH HALL, OF QUINCY, MASSACHUSETTS.

IMPROVEMENT IN CARPET-SWEEPERS.

Specification forming part of Letters Patent No. **187,374**, dated February 13, 1877; application filed December 15, 1876.

To all whom it may concern:

Be it known that I, WILLIAM SMITH HALL, of Quincy, in the county of Norfolk and State of Massachusetts, have invented an Improved Sweeping-Machine, of which the following is a specification:

This invention relates to sweeping-machines of the class wherein the dirt or dust is taken up by the action of a current of air, and is an improvement on United States Patent No. 91,145. In that patent the dust and dirt are discharged into a porous receptacle, the air accompanying the particles passing through the receptacle into the apartment.

The current of air to take up the dust and dirt particles is created by a rotating fan of any usual construction. In that patent the particles passed through the fan-chamber to the porous receptacle; but in this invention the particles are stopped by a reticulated or foraminous screen placed between the surface being swept and the fan-chamber. In that patent the particles were taken up only by the action of suction; but in this invention the sweeper-case is so constructed that the fan, besides acting as a suction-fan, also acts as a blast to assist in moving the particles from the surface being swept.

This invention has reference to the combination in a sweeping-machine, with a rotating fan, of a reticulated or foraminous screen placed between the dust or dirt receptacle and the fan-chamber; also, to the combination, with the rotating fan and screen, of a clearer to remove the dust particles from the screen, to prevent its perforations or passages becoming clogged or stopped; also, in the combination, with a fan and fan-case and dirt-chamber, of a deflector to direct the blast of air generated by the fan upon the surface of the floor or surface being swept, from which point it is further deflected into the dirt-chamber, the blast and suction of the fan together operating to dislodge and pick up the particles of dust and dirt and convey them to the dirt-receptacle. In this way the current of air generated or set in motion by the fan is practically and substantially confined inside the sweeper, and does not affect the atmosphere of the apartment to the degree that it does when the air sucked up by the fan is again discharged into the apartment.

By means of a sweeper constructed in accordance with this invention the creation of floating dust and dirt in the apartment being swept is substantially obviated or prevented, which is a feature of great sanitary importance.

Figure 1 represents an end view of this improved sweeper, the end casing being removed on line *x x*, to show the construction of the parts. Fig. 2 is a longitudinal section on line *y y*, Fig. 3; and Fig. 3 is a top view, partially broken away, to show the partitions in the air-passage, to be hereinafter referred to.

The fan-wheel *a*, having in this instance four arms, has its shaft *b* sustained by a bearing, *c*, and is provided at one end with a pulley, *d*, driven to rotate the fan by means of a belt or equivalent, *e*, extended about a pulley, *f*, the latter having an attached smaller pulley, *g*, driven by a belt, *h*, set in motion by a pulley, *i*, rotated by hand, the pulley *i* being adjustably held upon the handle *j* of the sweeper, suitably hinged at its lower end with the sweeper-case, or axle supporting the wheels of the sweeper-case. The fan rotates within a fan-case, *k*, one side of which is the end of the sweeper-case, and the other the plate or wall 2 (see Fig. 1) and reticulated or foraminous screen *m*, the main part of the remaining portion of the case being herein shown as curved and arranged about the fan-wheel. A spout, *n*, forming part of the fan-case leads into the gathering-chamber *o*.

The back portion of the sweeper is supported by wheels 3 4, turning on an axle, 5, with which the handle *j* is suitably hinged. The wheel 3 has a crank-pin, 6, connected by link 7 with an arm, 8, of a shaft, 9, adapted to operate a clearer, *p*, that moves substantially in contact with the surface of the reticulated screen *m*, against which the particles of dust, dirt, paper, &c., picked up from the surface being swept strike. The current of air, being substantially continuous through the openings of the screen, causes the fibrous or other particles gathered from the floor to cling to the face of the screen, and it would soon become clogged or stopped so as not to oper-

ate in the best manner were it not for the clearer, which detaches the dust particles collected thereon.

At the forward portion of the sweeper-case is a gathering-chamber, *o*, into which the particles of dust are first gathered. This chamber has a bottom plate, 10, with a flat presser-plate, 11, extending from end plate to end plate 12 of the chamber, the plate 11 resting upon and substantially flush with the surface of the floor or upon the carpet. The top and front plates of the chamber are represented by figures 13 14. Near the lower edge of the front plate 14 is placed a deflecting-plate, 15. The air drawn into the sweeper-case by the fan enters the opening *t* between the deflecting-plate and the presser-plate, and such air, acting upon the dust and dirt on the floor, is drawn into the dirt-receptacle *s*, conveying with it the dirt, where it is lodged and retained, the screen preventing its passage therefrom. The current of air received at opening *t*, and set in motion by the rotating-fan, is, when cleared of the most of the floating or heavy particles of dirt and fiber, blown by the fan from the spout into the gathering-chamber, and, striking the inclined, or it may be an inwardly-curved, deflecting-plate, 15, is turned against the floor, and by it again deflected into and through the gathering-chamber, over plate 10, and into the chamber *s*. In this way I am enabled to avail myself of the suction and the blast, and the air is not discharged into the room. When the fan ceases to move the dust and dirt settle in the chamber *s*, from which they may be removed through a suitable hinged door, (shown in this instance at *b'*.) The shape of the case composing the chamber may be varied without departing from this invention; so, also, may the fan-wheel and clearer be modified—as, for instance, the clearer might be attached to the axle and rotate.

A sweeper of this class does not wear the carpet, as does a sweeper depending upon a brush to raise the dust or dirt. The partitions *v*, located between the discharging-mouth of the spout *n*, through which the air is forced as a blast against the deflecting-plate and floor, and the end of the gathering-chamber, act to separate the air-passage leading from the gathering-chamber into the dirt-receptacle into several passages, and in this way the force of the blast of air is distributed more evenly in the passage than it would otherwise be, for without the partitions the air would collect with greatest force at the end of the case, and the particles of dust and dirt would not be so surely picked up entirely across the opening *t*.

I claim—

1. In a sweeping-machine, the combination, with a rotary fan, fan-case, and dust or dirt receptacle, of a reticulated or foraminous screen arranged between the fan and dirt-receptacle, substantially as described.

2. In a sweeping-machine, the combination, with the fan, fan-case, and reticulated screen, of a clearer to act upon the particles of dust and dirt lodged against the screen, substantially as described.

3. In a sweeping-machine, the combination, with a fan-case and spout and dirt-receptacle, of a rotary fan and deflector, adapted to create and maintain a current of air through the sweeper, substantially as described.

4. The combination of the fan, fan-case, and deflector with the gathering-chamber and dirt-receptacle, substantially as described.

5. In a sweeping-machine, a rotating fan-wheel, in combination with a gathering-chamber, and an air-deflector to deflect the air set in motion and forced from the fan-case upon the floor, and direct it thence into the sweeper-case, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM SMITH HALL.

Witnesses:

G. W. GREGORY,

S. B. KIDDER.