

(No Model.)

2 Sheets—Sheet 1.

J. J. HARVEY.
DUST REMOVER.

No. 577,854.

Patented Mar. 2, 1897.

Fig. 1.

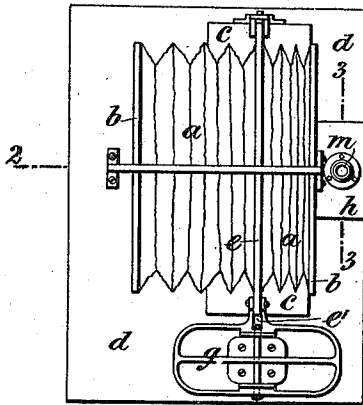


Fig. 2.

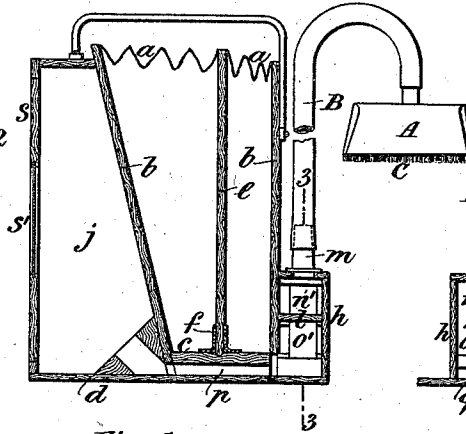


Fig. 3.

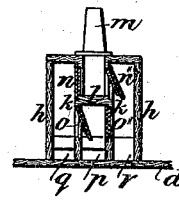


Fig. 4.

Fig. 5.

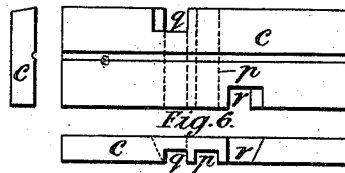


Fig. 6.

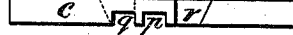


Fig. 7.

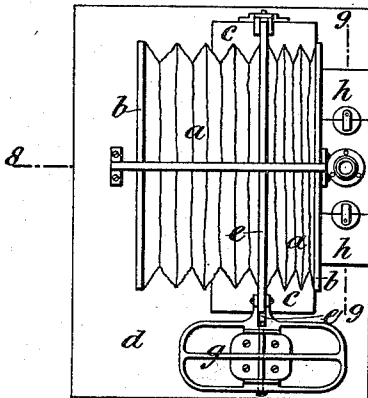


Fig. 8.

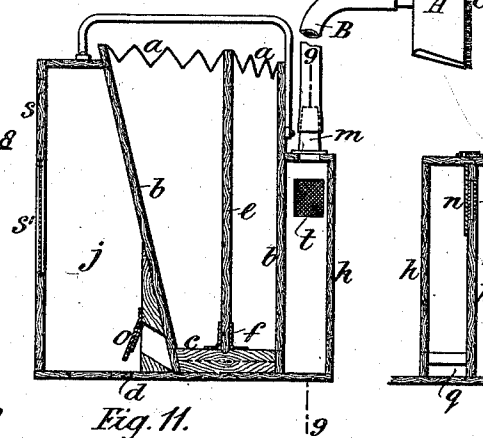


Fig. 9.

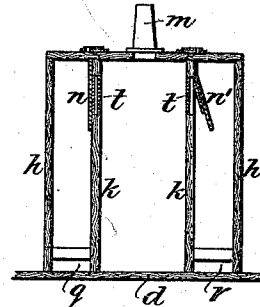


Fig. 10.

Fig. 11.

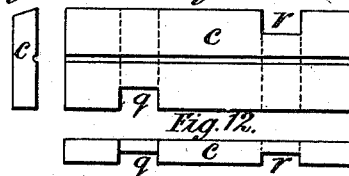
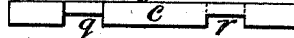


Fig. 12.



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Fig. 13.

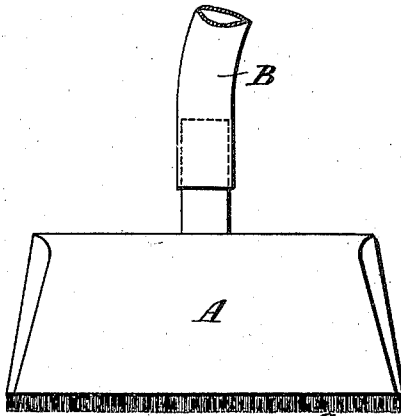


Fig. 14.

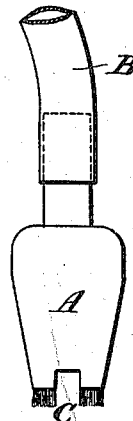
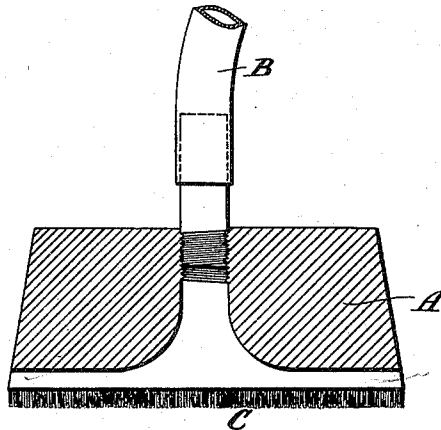


Fig. 15.



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UNITED STATES PATENT OFFICE.

JAMES JOSEPH HARVEY, OF KIDDERMINSTER, ENGLAND.

DUST-REMOVER.

SPECIFICATION forming part of Letters Patent No. 577,854, dated March 2, 1897.

Application filed March 16, 1896. Serial No. 583,459. (No model.) Patented in England January 10, 1893, No. 546, and March 3, 1894, No. 4,545.

To all whom it may concern:

Be it known that I, JAMES JOSEPH HARVEY, wine merchant, a subject of the Queen of Great Britain, residing at The Grove, Kidderminster, in the county of Worcester, England, have invented a certain new and useful Dust-Remover, (for which I have obtained Letters Patent in Great Britain, No. 546, dated January 10, 1893, and No. 4,545, dated March 3, 1894,) of which the following is a specification.

This invention relates to an apparatus especially adapted for removing dust from the surface of books, ornaments, pictures, and the like.

The apparatus consists of a nozzle, preferably flat, connected by a flexible pipe to an exhaust which draws loose dust from any surface, whether of books, papers, pictures, ornaments, or the like, without rubbing or damage, and at the same time wholly withdraws such dust from the apartment by suction through the nozzle and delivers it at the exhaust for disposal or destruction.

Figure 1 is a plan. Fig. 2 is a section on line 2 2, Fig. 1; and Fig. 3 is a partial section on the line 3 3, Figs. 1 and 2. Figs. 4, 5, and 6 are an end elevation, plan, and side elevation, respectively, of the block *c*. Fig. 7 is a plan of a modification in which the air is filtered before instead of after passing through the bellows. Fig. 8 is a section on the line 8 8, Fig. 7; and Fig. 9, a partial section on the line 9 9, Figs. 7 and 8. Figs. 10, 11, and 12 are an end elevation, plan, and side elevation, respectively, of the block *c*. The same letters are used in these figures as in Figs. 1 to 6. Fig. 13 is a side elevation, Fig. 14 an end elevation, and Fig. 15 a longitudinal section, of the nozzle *A* on a larger scale.

A is the nozzle, connected by a flexible pipe *B* to the bellows.

The edges of the nozzle may be covered with plush or other soft material *C*, as shown, to avoid damage to delicate surfaces, or it may carry a brush for rough work.

The leather *a* of the bellows is fixed to two boards *b b*, inclined to each other and standing up from a block *c* on a base-plate *d*, and is also fixed to a third board *e*, pivoted to the block *c* and free to oscillate between the other two, thus forming a double-acting bellows.

The oscillating board *e* is connected to the block by leather strips *f*, so as to make an air-tight joint, and one end of its axis *e'* is provided with a foot-board or treadle *g*, so that it can be rocked by the foot, or the treadle may be replaced by a handle. Fixed to the base-plate *d* on one side of the bellows is a valve-box *h*, and on the other side a cupboard *j* to receive the exhaust. The valve-box *h* is divided into four compartments by two vertical partitions *k k* and a horizontal partition *l* between the two vertical ones.

The upper central compartment is provided with a connection *m*, through which air is sucked from the nozzle *A* by the pipe *B*. It also has two flap-valves *n n'* at its sides opening outward, one into each side compartment. The lower central compartment also has two flap-valves *o o'*. These open inward from the two side compartments, and it is also connected by a passage *p* (formed by the base-plate *d* and a slot on the under side of the block *c*) to the cupboard.

One of the side compartments is connected by a passage *q* (formed by horizontal and vertical slots in the block *c*, closed, respectively, by the base-plate *d* and one side board of the bellows) with the inside of the bellows on one side of the oscillating board *e*, while the other side compartment is connected by a passage *r* (formed by a vertical slot in the block *c* and the other side board of the bellows) with the inside of the bellows on the other side of the oscillating board *e*.

The door *s* of the cupboard has a hole *s'* in it, through which the air can escape, the dusts being arrested in it by a sponge in the first place and afterward by a porous bag, which are not shown in the drawings, or the cupboard may be replaced by a porous bag.

The action of the apparatus is as follows: The board *e* is assumed to be moving from right to left of Fig. 2, so drawing air into the right-hand bellows and expelling air from the left-hand bellows. The incoming air enters at the nozzle *m* and passes by the valve *n'* and passage *r* into the right-hand bellows, while the outgoing air passes from the left-hand bellows through the passage *q* past the valve *o* into the passage *p* and cupboard *j* and out through the hole *s'* in its door. Dur-

ing this time the valves *n* and *o'* are kept closed by the pressure of the outgoing and incoming air, respectively. When the board *e* is moving in the other direction, the valves *n* and *o'* are open, while *n'* and *o* are closed. In the arrangement shown at Figs. 7 to 12 the horizontal partition *l* in the valve-box is omitted, the central compartment forming a receptacle for the dust, which is prevented from entering the bellows by screens *t*, of wire-gauze. The passage *p* in the block *c* is also omitted, and the valves *o* *o'* are at the side of the block at the ends of the passages *q* and *r*. In other respects the arrangement is similar to that shown at Figs. 1 to 6.

The screens *t* may be replaced by a porous bag.

What I claim is—

1. In a dust-remover the combination of a nozzle, double bellows consisting of two fixed boards with an oscillating board between them and a flexible pipe connecting the nozzle and the bellows.
2. In a dust-remover the combination of a nozzle, a pair of bellows, means for arresting the dust and a flexible pipe connecting the nozzle and the bellows.
3. In a dust-remover the combination of a nozzle, double bellows consisting of two fixed boards with an oscillating board between

them, a double valve-box at one side of the bellows, passages in the base-plate, connecting the valve-box with the inside of the bellows, and a flexible pipe connecting the valve-box and the nozzle.

4. In a dust-remover the combination of a nozzle, double bellows consisting of two fixed boards with an oscillating board between them, a double valve-box at one side of the bellows, passages in the base-plate connecting the valve-box with the inside of the bellows, a receptacle for arresting the dust attached to the bellows and a flexible pipe connecting the valve-box and the nozzle.

5. A dust-remover consisting of the combination of a cupboard or dust-receiver, an oscillating board *e*, air-chambers on opposite sides thereof, flexible material attached to the board at one end and closing the air-chambers at one end, a valve-chamber communicating with the air-chambers on opposite sides of the oscillating board, and with the cupboard or dust-receiver, a nozzle, and a flexible pipe connecting the nozzle with the valve-chamber.

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Witnesses:

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WM. C. SADLER.