H. SMALL.

VACUUM CLEANING APPARATUS.

APPLICATION FILED NOV. 27, 1914.

1,130,114.

Patented Mar. 2, 1915.

2 SHEETS—SHEET 1.

FIG. I.

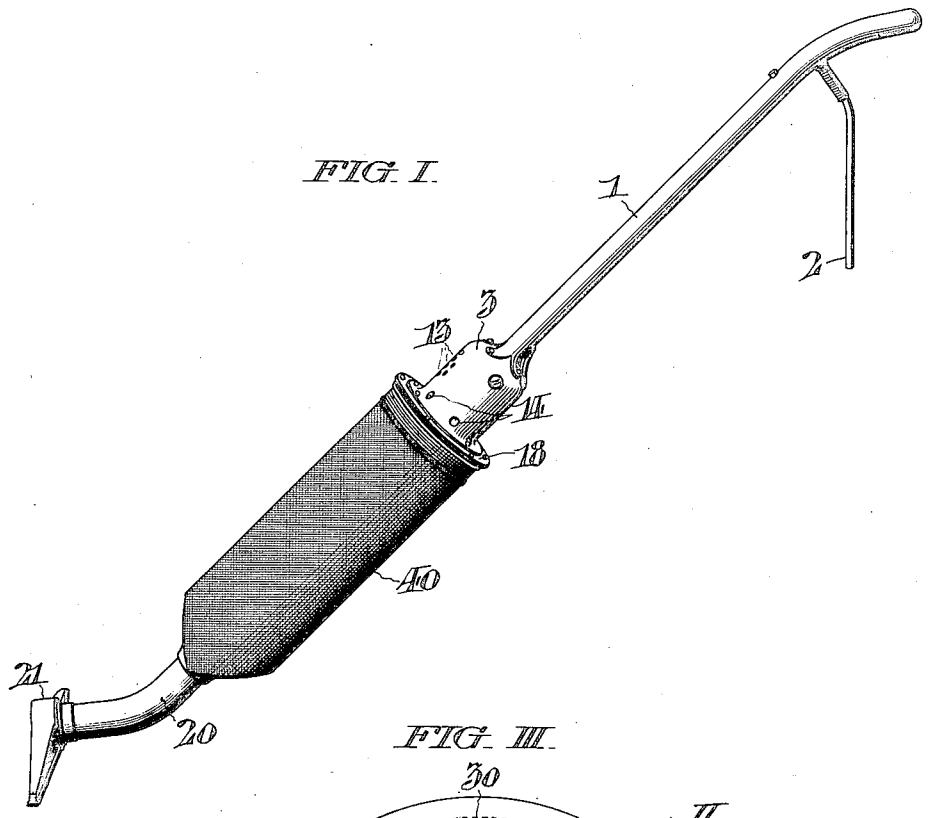
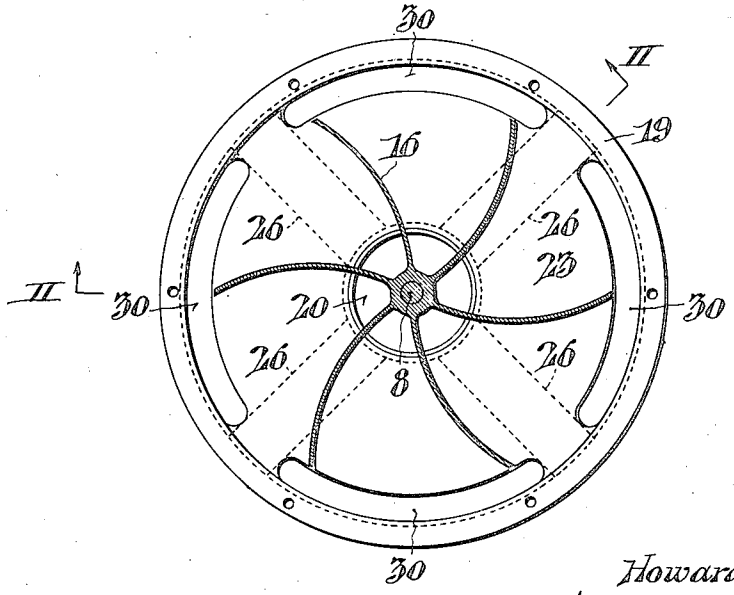



FIG. III.

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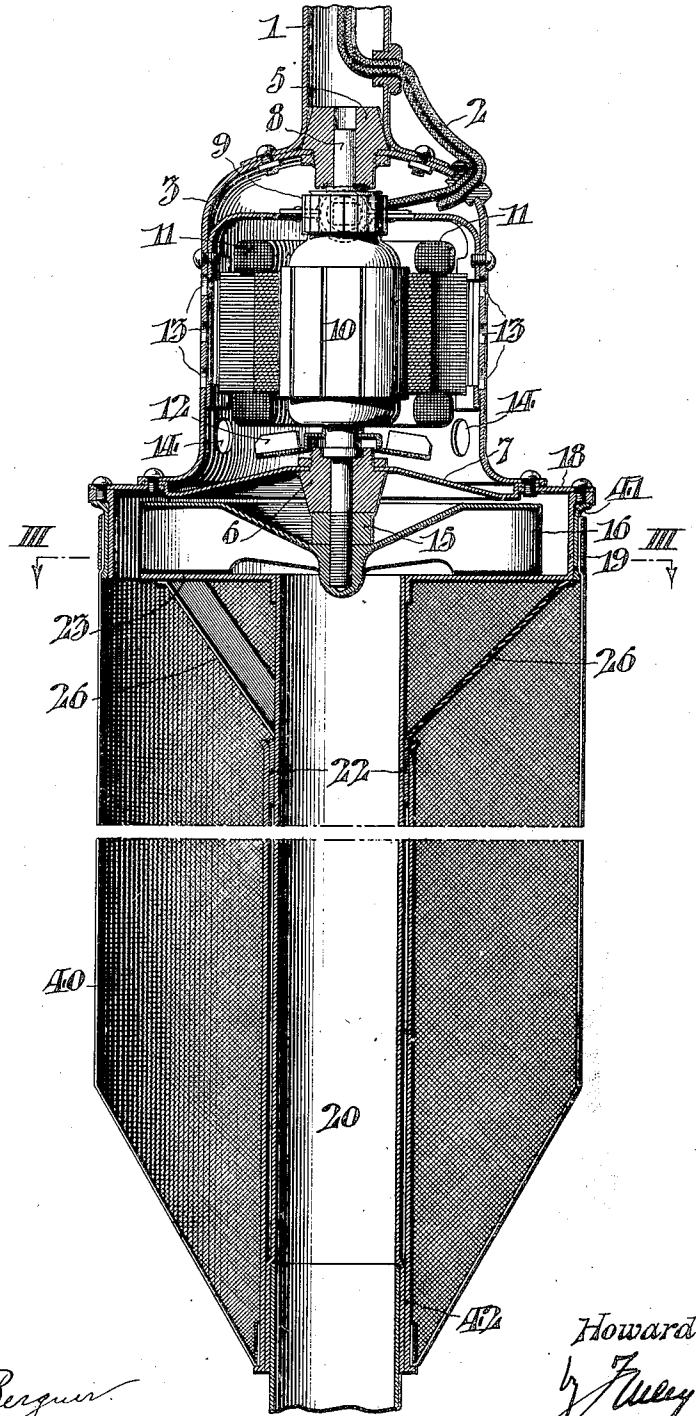
2 SHEETS—SHEET 2.

FIG. II.

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# UNITED STATES PATENT OFFICE.

HOWARD SMALL, OF WYNCOTE, PENNSYLVANIA, ASSIGNOR TO SANTO MANUFACTURING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF DELAWARE.

## VACUUM CLEANING APPARATUS.

1,130,114. Specification of Letters Patent. Patented Mar. 2, 1915.

Application filed November 27, 1914. Serial No. 874,173.

*To all whom it may concern:*

Be it known that I, HOWARD SMALL, of Wyncote, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Vacuum Cleaning Apparatus, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to a vacuum cleaner of the light portable type in which the motor, fan and dust bag are supported axially between the handle and the cleaning tool.

My invention relates more specifically to a construction whereby this is accomplished in such a way as to permit these intermediate parts to be mounted nearer the cleaning tool than to the handle without so encumbering the parts as to impede the use of the tool.

It is important that the tool be free to pass under furniture, and the larger parts of the cleaner must not interfere with this use. It is also important that for the purpose of proper manipulation the handle and the related part of the shaft should be free in order to properly manipulate the tool. The whole tool must be made as light as possible and the construction which I have invented consists in a combination of parts which accomplishes all these ends.

In the accompanying drawings, I have illustrated a vacuum cleaner which embodies my invention.

Figure I, is a side elevation of such a cleaner. Fig. II, is an enlarged central sectional view of the motor fan and dust receptacle. The lower portion of this figure is a staggered section as indicated by the arrows II—II, in Fig. III. Fig. III, is a cross section along the line III, III, of Fig. II.

The handle 1, is formed upon the upper end of a hollow shaft through which is passed the cable 2, comprising the wires by which the motor is operated. To the lower end of this shaft there is attached a motor casing 3, which may conveniently be formed of bell shape, as shown, with a bearing 5, inserted at the top and also a bearing 6, sustained at the bottom of the bell by the annular disk 7, which is attached to the lower flange of the bell shaped casing. Within these bearings is mounted the motor shaft 8, carrying the commutator 9, and the armature 10, of an electric motor, of which the field coils are indicated at 11, being set within the motor casing. This motor may be appropriately ventilated by the fan 12, and draft apertures 13, and 14. The motor shaft 8, projects through its lower bearing and there carries, with the interposition of a nut 15, a fan 16. To the flange of the motor casing is attached an annular disk 18, with a flange 19. The suction tube 20, which is in alinement with the shaft of the tool, and also with the motor shaft, carries the cleaning tool 21, at the lower end, while its upper end carries a disk 23, which is united to the above mentioned flange 19. The disk 23, is pierced by apertures 30, through which the dust laden air which has passed directly from the suction tube into the fan chamber is discharged from the lower side of the fan passing between a row of arms 26, which run from the flange 19, to a ring 22, surrounding the suction tube and forming the lower side of the fan casing.

A dust bag 40, of a fabric suitable for dust filtering, is attached at its upper end to a ring 41, which surrounds the flange 19. The lower end of this dust bag, which takes the form of an elongated cylinder, is attached to a collar 42, which slides telescopically upon the vacuum tube projecting well up within the dust bag so that when it is desired to empty the dust bag the collar 42, and the dust bag attached to it may be slid off the suction tube without scattering the dust contained in the bag.

In operation, the rotation of the motor drives the fan to cause continuous travel of air from the cleaning tool through the vacuum tube to the region of the fan. From thence, the dust laden air is expelled from the lower side of the fan and passes into the dust bag which retains the dust permitting the air after being cleansed to pass out through its interstices.

Having thus described my invention, I claim:

1. A vacuum cleaner consisting of a shaft with a handle, a motor casing, and motor attached to the end of the shaft, a fan driven by the motor, a vacuum tube in alinement with the shaft below the motor and the fan, a flanged disk surrounding the fan, and a

permeable dust bag attached at one end to the flanged disk and at the other end to the vacuum tube both of which are surrounded by said dust bag.

2. In a vacuum cleaner the combination of a fan, a flanged disk surrounding the top and sides of the fan, a suction tube in alinement with the axis of the fan, a collar sliding on the suction tube, and a cylindrical dust bag attached at its upper end to the flanged disk surrounding the fan and at its lower end to the collar.

In testimony whereof, I have hereunto signed my name, at Philadelphia, Pennsylvania, this twenty-fourth day of November, 1914.

HOWARD SMALL.

Witnesses:
JAMES H. BELL,
E. L. FULLERTON.