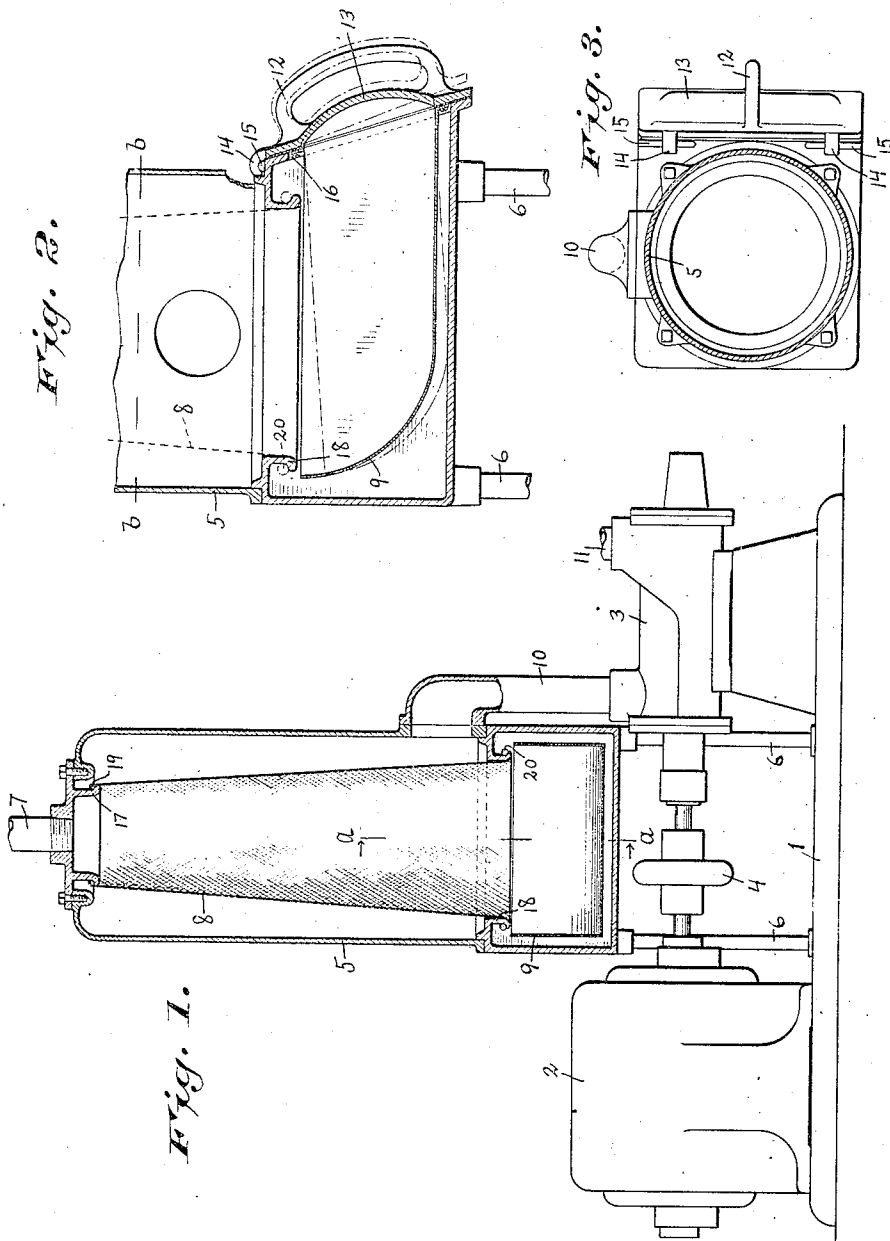


F. W. VAN NESS.
VACUUM CLEANING SYSTEM.
APPLICATION FILED MAY 2, 1910.

1,048,917.

Patented Dec. 31, 1912.



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1,048,917.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK W. VAN NESS, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Vacuum Cleaning Systems, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

This invention relates to vacuum cleaning systems and particularly to the dust and dirt receptacles and separators for said systems.

The objects of this invention are to improve the dust and dirt separators and to automatically prevent the further accumulation of dust and dirt when the receptacle therefor is so full that it should be emptied.

A further object of this invention is to provide a removable dust and dirt receptacle of such a character that it will itself be operable to prevent further accumulation of dust and dirt therein when it is so full that it should be emptied.

Referring to the drawings which accompany this specification and form a part thereof, on which drawings the same reference characters are used to designate the same elements wherever they may appear in each of the several views, and which drawings illustrate embodiments of this invention, Figure 1 is an elevation of part of a vacuum cleaning system, parts being shown in section; Fig. 2 is a vertical section of part of the system taken on the line *a-a*, Fig. 1, looking in the direction indicated by the arrows, a part being broken away; and Fig. 3 is a plan view taken on the line *b-b*, Fig. 2, part being shown in section.

Referring specifically to the drawings, the numeral 1 designates a base upon which is mounted an electric motor 2, and a vacuum creating pump 3 with which the motor is directly connected by a coupling member 4. A dirt and dust separator 5 is supported by standards 6 upon the base 1 and this dirt and dust separator 5 communicates with the vacuum cleaning system by means of a pipe 7 through which the air and dirt is discharged inside of a fabric bag 8 which is open at its top and bottom as clearly shown by Fig. 1 of the drawings, and below said bag is hung the dirt and dust receptacle 9 so that the dust and dirt which falls from pipe 7 will fall into receptacle 9 and the

dust and dirt which accumulates on the inside of bag 8, until enough has accumulated so that it will fall off, will also fall into receptacle 9. The pump 3 is provided with an inlet pipe 10 which communicates with the dirt and dust separator 5, as shown, and pump 3 is also provided with an exhaust pipe 11.

The dirt and dust receptacle 9 is in substance and effect a box of the same general nature as the ash pan of a stove, and for convenience, in removing and replacing it, it is provided with a handle 12. The receptacle 9 may be constructed as shown, with a heavy front cover or closure 13, which is removably hung by hooks 14, upon lugs 15, so that said cover and the box secured thereto can swing by hooks 14 upon lugs 15, as clearly shown by the drawings. The closure or cover 13 makes close contact with the dust separator 5 all around the opening 16 therein into which the box part of the receptacle is inserted, and preferably the cover 13 when in its closed position, is inclined to the vertical as shown by Fig. 2 of the drawings, so that its weight will hold it tightly against the sides of opening or aperture 16, and furthermore, when the vacuum exists in the system, the cover 12 will be held tightly against the sides of said opening 16 because of the excess pressure of the external atmosphere on the outside of the cover over the lower pressure in the system on the inside of the cover.

The function and operation of this part of the system is as follows: With the motor 2 in operation, the pump 3 will be exhausting air from the dirt and dust separator 5 and air together with dust and dirt will enter the separator through pipe 7. The air will be drawn through the fabric bag 8, while the dust and dirt will be retained inside of said bag and will drop into the receptacle 9. When enough dirt has been collected in receptacle 9 to overbalance the weight of cover 13 and the excess air pressure thereon, the receptacle 9 will tilt upon the lugs 15, thereby swinging the lower edge of cover 13 away from the sides of opening 16 so as to afford a free communication between the atmosphere and the interior of the separator 5, thereby breaking the vacuum therein so that the pump 3 can no longer create and maintain a vacuum in the system, and if an operator is using a cleansing tool, the opera-

tor will notice that no air is rushing into the tool and will know that the dust receptacle requires emptying. If on the other hand, the dust receptacle is so full that when further operation of the system is discontinued and the pressure in the system approaches atmospheric pressure so that the cover 13 is not kept closed because of a difference in the pressures on opposite sides thereof, then the cover 13 will swing open and when the operator attempts to start the system for use again, the operator will notice that no air is passing into his tools and will know that the dust receptacle needs to be emptied.

The improvement in the dust and dirt separator consists in having the pipe 7 discharge directly downwardly into the receptacle 9 without any obstruction in the path thereof; in having the fabric bag 8 surrounding the path of travel of the dust and dirt from pipe 7 to receptacle 9; in having the shell of separator 5 outside of said bag so that the inlet pipe 10 which communicates with the pump only takes air which has passed through said bag; in having the bag enlarge or flare downwardly so that no dust or dirt can find a lodgment on the bag except on the under side of an overhanging surface so that if dust and dirt accumulates on the bag it will eventually drop off by gravity into receptacle 9; and, lastly, by so securing the bag 8 that the securing means are outside of the path of the dirt and dust which falls into receptacle 9. An inspection of Fig. 1 of the drawings shows clearly these several features of construction and they do not require extended description for that reason. The separator 5 is provided with two flanges 17 and 18 which have lips extending outwardly with respect to the path of travel of the dust and dirt from pipe 7 to receptacle 9 and the bag is passed over the

outside of the upper flange 17 and is secured thereto by any suitable or preferred fastening means 19, such, for example, as an elastic band or a cord. The bag is passed inside of the lower flange 18 and then up around the outside thereof and is secured by a member 20 in the same manner and, if desired, of the same kind as member 19.

The advantages of the construction just described are obvious. No pockets exist in which dust and dirt can lodge, and even if dust and dirt do adhere to the bag it will eventually drop off by gravity so that the bag can be aptly described as "self cleaning." The bag can be made large in diameter so as to have a large surface which reduces the velocity of the air passing through it per unit of surface so that the velocity can be reduced to the minimum whereby no dust will be forced through the bag leaving only clean air to be handled by the pump. The lower flange 18 which is located between the outlet to the inlet pipe 10 of the pump and the dust and dirt receptacle 9 prevents the action of the suction of the pump from disturbing the dust and dirt after it has collected in receptacle 9.

What is claimed is:

The combination with a vacuum cleaning system having a dust and dirt separator provided with an inclined face in which there is an aperture, of a removable dust and dirt receptacle adapted to be hung in said aperture and provided with a heavy closure to rest against said inclined face to close said aperture.

In witness whereof I hereto affix my signature in presence of two witnesses.

FRANK W. VAN NESS.

Witnesses:

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