Mar. 13, 1923. 1,448,322.

G. B. WIRLS

DUST COLLECTOR FOR PORTABLE VACUUM CLEANERS

Filed Feb. 17, 1921

Fig. 1.

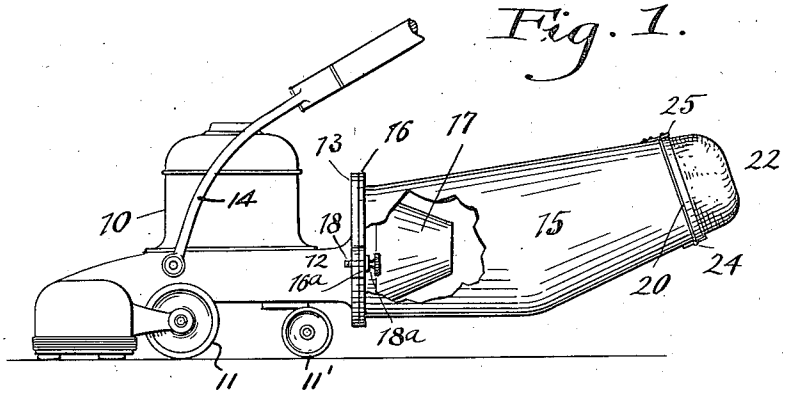


Fig. 3.

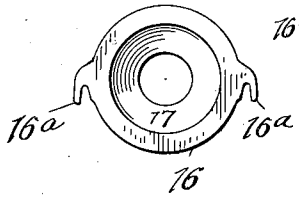
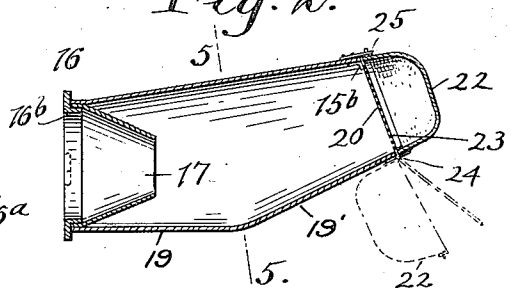


Fig. 2.



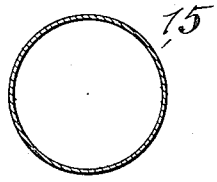


Fig. 5.

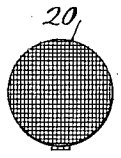


Fig. 4.

Inventor.
Glen B. Wirls
by Thurston Kwis & Hudson
Attorneys

Patented Mar. 13, 1923. 1,448,322

UNITED STATES PATENT OFFICE.

GLENN B. WIRLS, OF SHAKER HEIGHTS, OHIO.

DUST COLLECTOR FOR PORTABLE VACUUM CLEANERS.

Application filed February 17, 1921. Serial No. 445,672.

To all whom it may concern:

Be it known that I, GLENN B. WIRLS, a citizen of the United States, residing at Shaker Heights village, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Dust Collectors for Portable Vacuum Cleaners, of which the following is a full, clear, and exact description.

The object of this invention is to provide a dust collector for portable domestic vacuum cleaners, which will be more durable, convenient, efficient and sanitary than the cloth dust collectors with which such vacuum cleaners are commonly provided.

The invention consists in the construction and combination of parts shown in the drawings and hereinafter described and pointed out definitely in the appended claims.

In the drawing, Fig. 1 is a side elevation showing the invention; Fig. 2 is a longitudinal section of the dust collector which forms part of the present invention; Fig. 3 is a front end view of the said dust collector; Fig. 4 is a view of the strainer at the rear end of the dust collector, and Fig. 5 is a sectional view on the line 5—5 of Fig. 2.

Referring to the drawings, 10 represents a portable domestic vacuum cleaner of any suitable make or construction, the cleaner as shown herein being mounted upon suitable wheels 11 and 11′. It is provided with a rearwardly extended discharge pipe 12 through which the dust laden air is discharged from its rear end. The rear end of this discharge pipe is provided with a marginal flange 13 normal to the axis of the pipe. A handle 14 is pivotally secured to the body of said cleaner and is freely movable with respect thereto providing means whereby the cleaner can be conveniently pushed or pulled over the floor.

15 represents a dust collector which is made of metal, preferably aluminum, because the lighter it is, the better. At its inlet end it is secured to a flat annulus 16 which corresponds in size and shape to the flanged discharge end of the pipe 12. Within this collector at the inlet end thereof there is a thin metal hollow cone 17 which at its large end fits within the end of the collector, and both of these parts embrace and are securely fastened to each other and to the cylindrical flange 16^b on the annular plate 16. The receiving end of the cone 17 has considerably greater cross sectional area than the discharge pipe 12 whereby it forms an expansion chamber intermediate the discharge pipe 12 and the interior of the collector 15. Dust laden air entering the cone 17 from the discharge pipe 12 expands within the cone 17 and is slowed down somewhat whereby heavier particles carried in suspension settle to the bottom of the cone 17. As shown in Fig. 1 the pipe 12 communicates with the cone 17 adjacent its lower edge whereby such of the heavier particles as settle to the bottom of the cone 17 are carried by the air stream into the collector 15. By reason of this arrangement a considerable portion of the solid matter in the air stream is separated and deposited adjacent the receiving end of the collector 15.

The receiving end of the metallic dust collector is removably connected to the fixed discharge end of the pipe 12. The means for making this connection which the drawing shows consist of two outwardly extended and diametrically disposed ears 16^a formed on the annular plate 16, which are notched from their lower edges upward; and screws 18 which screw into and project rearwardly from ears 13^a on the flange 13. The notched ears 16^a go between the ears 12^a and the heads 18^a of the screws 18. By screwing in the screws the front face of the annular plate 16 is clamped against the flanged end of the pipe 12 making a substantially air tight connection.

The tubular body of the collector 15 has a straight top portion extending upwardly at a slight angle with respect to the discharge pipe 12. At the bottom thereof the collector 15 has a horizontally disposed portion 19 extending rearwardly from the receiving end thereof and on upwardly inclined rear end portion 19′. By reason of the construction above described the collector 15 has a central enlarged portion immediately at the rear of the discharge end of the cone 17 providing an expansion chamber to slow down the air stream and precipitate solid matter therefrom.

The collector is formed with an open rear end; which end is normally closed by an obliquely disposed foraminous strainer plate 20, and outside of that by a cloth cap 22. The cloth cap is secured to a ring 23, which is hinged at 24 to the collector. The strainer plate is hinged to the collector preferably on the same axis 24 as the cap ring. When both are swung to the closed position shown

in Figs. 1 and 2, the strainer plate engages a lug 15[b] within the collector, and the cap is held in the closed position with its edge in contact with the strainer plate by a latch 25 of any suitable construction.

When the cleaner is in operation it will discharge dust laden air through the pipe 12 into the cone 17 in which the air stream is partially slowed down whereby a portion of the solid matter therein settles toward the bottom of the cone and is delivered along the lower edge thereof and drops to the bottom of the collector 15. The air stream issuing from the contracted end of the cone 17 passes into the enlarged portion of the collector 15 which serves as an expansion chamber to cause more of the solid material to settle in the collector. The inclined wall 19' serves to further retard the air stream and to deflect it angularly upon the face of the strainer plate 20 whereby accumulation of lint or other material thereon is prevented. The air will escape through the strainer plate 20 and the cloth cap 22. The strainer plate will prevent the passage of all foreign particles, except very fine dust, into the cloth cap; and this will trap and hold the fine dust.

The cone 17 in the receiving end of the conductor acts as a baffle to substantially prevent any dust or dirt from going back from the collector into the cleaner pipe 12. It also prevents the dust and dirt which has been discharged into the collector from running out of the receiving end of the collector onto the floor when the collector is disengaged from the cleaner. When the collector has been disengaged from the cleaner the contents thereof may be removed through the open rear end of the collector,—the cap and strainer plate being swung open as shown by dotted lines in Fig. 1 to permit this.

It will be understood that the receiving end of the collector may be varied in shape to whatever extent may be necessary to make it fit the discharge end of the cleaner; and also that the specific closure for the open end of the collector may be varied to a considerable extent without departure from the invention.

Having described my invention, I claim:—

1. The combination of a vacuum cleaner, dust collector comprising an expansion chamber, which communicates with the discharge pipe of the cleaner, said dust collector being provided with an air outlet, a foraminous strainer plate fitted across said outlet, and a cloth cap removably secured at its edge to said collector and covering said outlet outside said strainer plate.

2. The combination of a vacuum cleaner, and an elongated tubular dust collector which is separably connected at one end with the end of the discharge pipe of the cleaner said dust collector being provided with an air outlet at the other end, a strainer removably secured over said outlet, and a hollow cone having its large end fitting within the receiving end of said collector, said cone lying within the collector, and having its small end opening into said collector.

3. The combination of a vacuum cleaner provided with a flanged discharge end, a thin metal dust collector, a flat annular plate fitted against the rear flanged end of the discharge pipe of the cleaner,—which annular plate is provided with a cylindrical flange which is fitted into and secured within the receiving end of said dust collector, means for separably connecting said flat annular plate with the rear flanged end of the discharge pipe of the cleaner,—said cleaner being provided with an air outlet, and a cloth cap removably secured thereover.

4. The combination of a vacuum cleaner provided with a flanged discharge end, a thin metal dust collector, a flat annular plate fitted against the rear flanged end of the discharge pipe of the cleaner, which annular plate is provided with a cylindrical flange which is fitted into and secured within the receiving end of said dust collector, and said annular plate being provided with slotted ears, and screws carried by the flanged end of the discharge pipe of the cleaner for engagement with said slotted ears, the collector being provided with an air outlet and a cloth cap secured thereover.

5. The combination of a vacuum cleaner, a thin metal dust collector which is separably connected with the discharge pipe of the cleaner, said collector being open at its rear end, a foraminous strainer plate fitted across said opening and hinged to the collector, a ring likewise hinged to said collector, a cloth cap carried by said ring,—said ring being adapted to engage the strainer plate and hold it in closed position, and a latch for holding the cap in the closed position.

6. The combination with a vacuum cleaner, of a tubular dust collector communicating at one end with the discharge pipe of the vacuum cleaner, the opposite end of said collector being open and having an air straining cover comprising a foraminous strainer plate detachably secured therein through which the air first passes and a cloth cap through which the air subsequently passes, said cap being removably secured over the open end of said collector outside said strainer plate and having a tight fit at its edge with the end of the collector.

7. The combination of a vacuum cleaner, having a discharge pipe with an end flange, said flange being wider at the top of the pipe, of a dust collector comprising a tubular body secured at one end to said flange, a

hollow open ended conical member secured within said tubular member with its enlarged open end over the outlet end of said discharge pipe, said conical member being of greater cross-sectional area at its receiving end than said discharge pipe and so disposed with respect to said discharge pipe that said pipe discharges thereinto adjacent the lower edge thereof, said tubular body having an air discharge outlet and a strainer over said outlet.

In testimony whereof, I hereunto affix my signature.

GLENN B. WIRLS.