

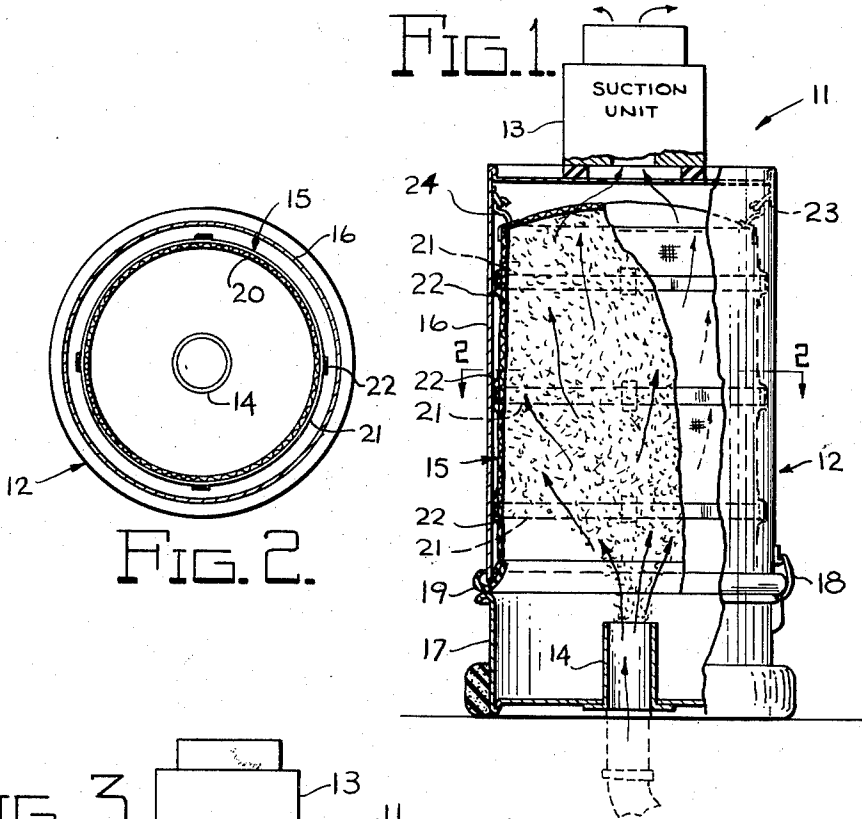
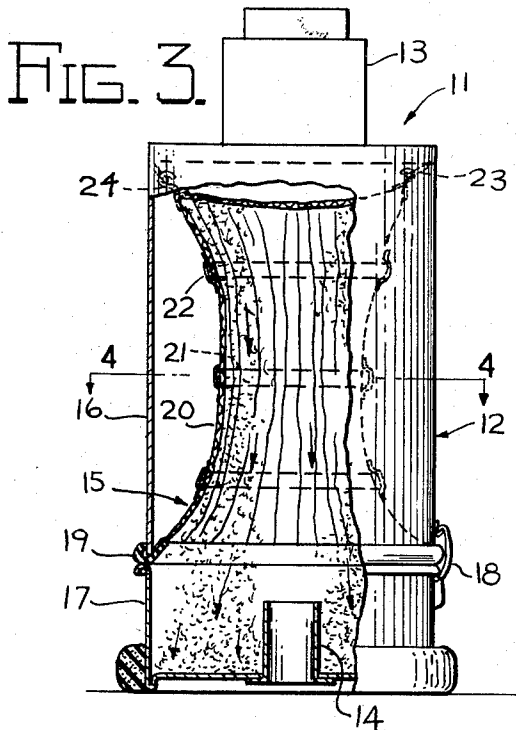
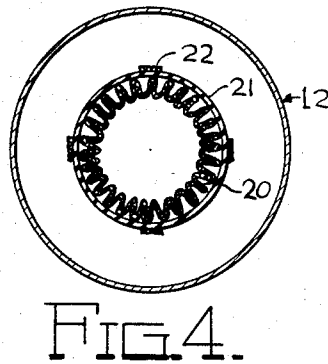
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VACUUM CLEANER

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VACUUM CLEANER

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2 Claims. (Cl. 183—58)

This invention relates to an improved vacuum cleaner and more particularly to an improved dirt retaining bag especially for a canister-type vacuum cleaner.

In a canister-type vacuum cleaner, the suction side of a blower is usually connected to a vacuum cleaner nozzle unit through a canister in which a dirt retaining bag is interposed in an air stream established by the blower. During operation of the cleaner the wall forming the bag gradually becomes laden with dirt particles which lodge in interstices of the wall and are held on the surface thereof, thereby causing an excessive resistance to the flow of air which decreases the air flow through the cleaning nozzle and decreases the efficiency of the vacuum cleaner.

Most of the dirt in the wall of the bag can be removed by periodic shaking. In the conventional vacuum cleaner, the dirt retaining bag tends to collapse when the blower is shut off and the air pressure differential decreases across the bag. However, this movement of the bag is insufficient to remove much of the dirt retained in the interstices of the bag wall with the result that the dirt continues to build up, with either continuous or periodic operation of the cleaner, and reduces its effectiveness.

It has been discovered that resilient means can be provided in association with the bag wall to urge it toward a collapsed condition when the blower is shut off and that this motion can be sufficiently rapid and violent as to shake a substantial portion of the dirt particles from the wall. Of course, the force of the resilient means must not be sufficient to overcome the pressure of the air within the bag so that the bag can expand when the blower is operating. When the blower is shut off, the resilient means and the decrease in pressure cause the bag wall to collapse rapidly. The bag wall not only collapses more rapidly than conventional bags but collapses more fully and wrinkles so that most of the collected dirt is shaken out.

It is, therefore, a principal object of the invention to provide an improved dirt retaining bag for a vacuum cleaner which is more fully cleaned during periodic operation.

Another object of the invention is to provide an improved dirt retaining bag for a vacuum cleaner, which bag collapses more fully and rapidly than conventional ones when the vacuum cleaner is shut off whereby the dirt is more effectively shaken out.

Other objects of the invention will be apparent from the following detailed description of a preferred embodiment thereof, reference being made to the accompanying drawings, in which:

Fig. 1 is a view in elevation, with parts broken away, of a vacuum cleaner canister in operation and employing a dirt retaining bag embodying the principles of the invention;

Fig. 2 is a view in cross section taken on the line 2—2 of Fig. 1;

Fig. 3 is a view in elevation, with parts broken away,

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of the vacuum cleaner canister and dirt retaining bag shown in Fig. 1, with the cleaner shut off and the bag in a collapsed position; and

Fig. 4 is a view in cross section taken on the line 4—4 of Fig. 3.

Referring to the drawings, a canister type vacuum cleaner includes a canister unit indicated at 11 having a canister 12, a suction unit 13, an air inlet pipe 14, and a dirt retaining bag 15. The canister 12 is made of an upper part 16 and a lower part 17 which are suitably connected, as by means of clamps 18 with a resilient gasket 19 between the parts to establish an air tight joint. The two parts 16 and 17 can be separated by loosening the clamps 18 to enable dirt to be emptied from the lower part 17.

The dirt retaining bag 15 includes a flexible wall 20 through which air can pass, and a plurality of resilient means or bands 21 located at the periphery of the wall and held in position by loops or straps 22 attached to the bag wall 20. The bag 15 is supported in the canister by any suitable means that will prevent air from by-passing the bag. For example, the lower edge of the wall 20 can be affixed to the gasket 19 so that all air must flow through the wall 20 from the inlet pipe 14 to the suction unit 13. The upper portion of the bag 15 can be held up by any suitable means such as rings 23 and hooks 24.

In operation, the suction unit 13 is turned on to draw air and air-borne dirt through the inlet pipe 14 which is connected to a cleaner nozzle (not shown). Air entering the canister 15 must pass through the bag wall 20 causing a pressure differential to build up across the wall 20 and maintain it in an expanded position. As the air passes through the wall 20, the dirt is filtered out, with the clean air passing through the suction unit 13 and exhausted into the surroundings. When the suction 13 is shut off, the air pressure differential is eliminated across the bag 15 and the bands 21 rapidly and relatively violently cause the bag wall 20 to collapse and wrinkle as shown in Figs. 3 and 4, which causes the dirt on the inner surface of the wall and within the interstices thereof to be shaken out. The dirt falls down into the lower part 17 of the canister 12 which may be periodically cleaned out.

While only one form of a dirt retaining bag employing resilient means and only one particular design of vacuum cleaner have been shown, many modifications of the invention, particularly the resilient bands employed, will be suggested to the reader. Of course, it is to be clearly understood that such modifications can be made without departing from the scope of the invention as defined in the appended claims.

What I claim is:

1. In a vacuum cleaner having a canister, an air inlet at one portion of said canister, and means for establishing air flow into said canister through said inlet and out of said canister at a point spaced from said inlet, the improvement comprising a flexible wall interposed in the air flow path in the canister, said wall being of cylindrical configuration when expanded, having a closed end and an open end, and being capable of transmitting air therethrough, means for attaching the open end of said wall to the canister around the air inlet and spaced therefrom, means for removably attaching the closed end of said cylindrical wall to a portion of said canister spaced from said air inlet to hold the closed end of said wall in spaced relationship with respect to said open end attaching means, and at least one resilient band at the periphery of said wall and held at two spaced points on said wall to cause rapid collapse thereof when the air stream has diminished, said resilient band being spaced from both of said attaching means and lying in a plane generally perpendicular to the axis of said cylindrical wall.

2. A dirt retaining bag for a vacuum cleaner, said bag

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comprising a flexible wall through which air can pass, said wall assuming a generally cylindrical configuration when fully expanded, and at least one resilient band held on the outside of the periphery of said wall, lying in a plane perpendicular to the axis of said cylindrical wall, and having a diameter, when not stressed, less than that of said wall, whereby said band is stretched when air passes through said bag from the inside out and said bag assumes its expanded position, and said band causes said bag to collapse rapidly and to wrinkle into folds generally longitudinally thereof when air flow therethrough is stopped and said band moves toward its unstressed position, and means attached to said bag for holding said band in position when said bag is collapsed.

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