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2,249,013

CLEANING APPARATUS

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2 Sheets-Sheet 1

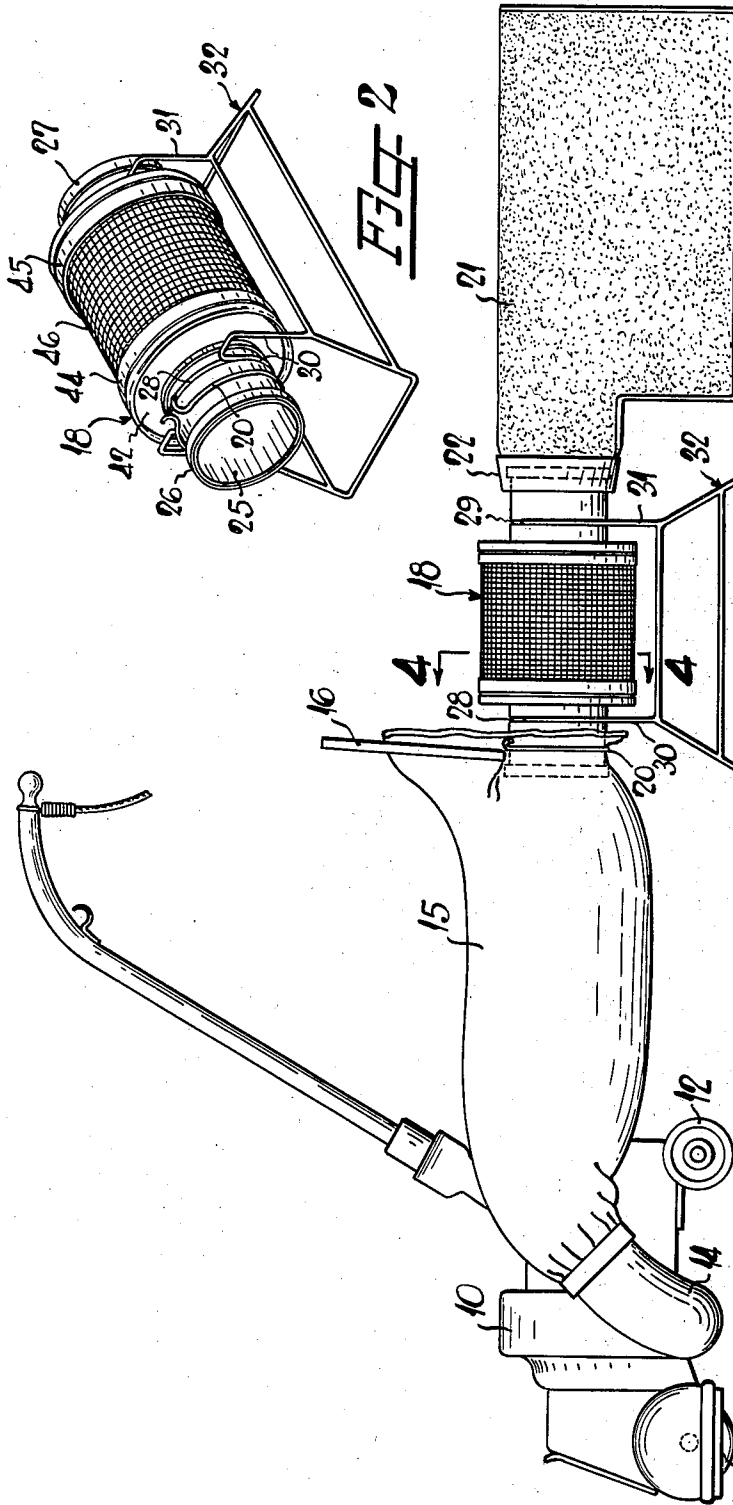


Fig. 1

Fig. 2

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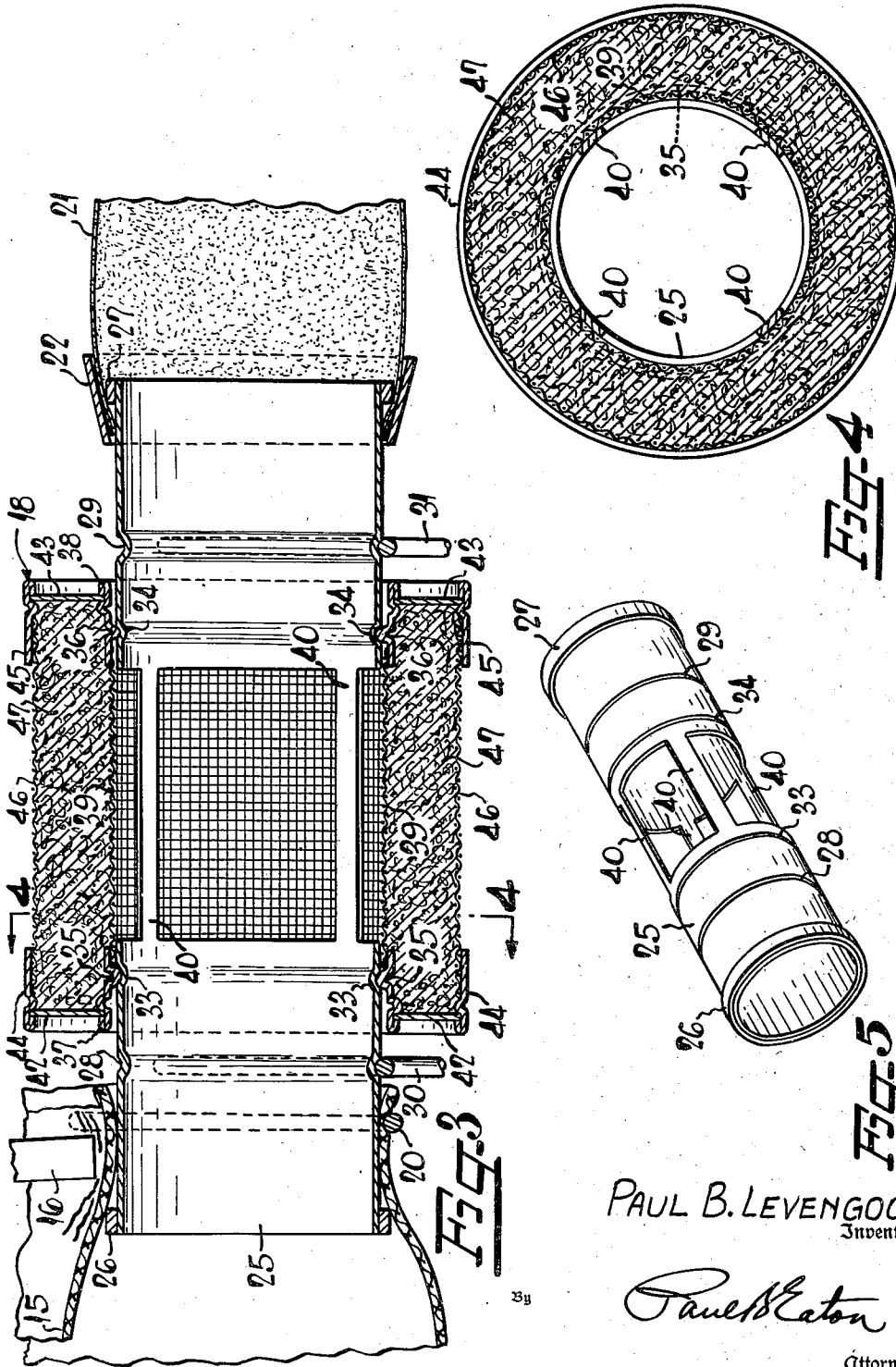
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CLEANING APPARATUS

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14 Claims. (Cl. 183—52)

This invention relates to an apparatus for cleaning the cloth bag receptacle of vacuum cleaners after a substantial amount of dust, dirt and the like has been collected therein, as the result of normal cleaning operations. More specifically the invention relates to a structure whereby the receptacle may be cleaned within a room by a forced draft created by the cleaner without allowing any of the collected matter to escape.

Most of the electric type vacuum cleaners are provided with a cloth bag receptacle which holds the accumulated dirt and dust. Frequent thorough cleaning of the bag receptacle is necessary, not only for sanitary reasons but also because the pores of the bag become completely filled, and the efficiency of the vacuum cleaner is thereby affected. The most ideal way to clean the cloth bag, if the accumulated dust and dirt were not objectionable, is to take the cleaner outdoors, open the end of the cloth bag, turn on the cleaner motor and let the draft blow the dirt out of the bag into open spaces. Since this is not practical in many cases, and it is often desirable to clean the bag within the residence, it naturally follows that it is necessary to provide some means for removing the accumulated matter from the bag without polluting the air within the room.

Heretofore, various efforts have been made to accomplish this purpose, among which were to secure a porous sack to the open end of the vacuum cleaner bag and then turn on the vacuum cleaner motor to cause a forced draft to remove the dirt from the bag and deposit it in the porous bag.

When such a method is employed in cleaning the vacuum cleaner bag, it is necessary to have a porous sack of considerable strength; otherwise the forced draft created by the vacuum cleaner will tear holes in the sack and make it useless. In other words, if a porous sack is provided which has sufficient strength to withstand the draft created by the vacuum cleaner during the removal of the dirt, the cost is prohibitive, and if the sack is used over again, it is necessary to take it along with the accumulated dirt therein on the outside and remove the dirt and shake the bag to clean the fine particles therefrom.

It is therefore an object of this invention to provide a mechanism associated with a vacuum cleaner to such an extent that a very light weight porous paper sack may be used to collect the dirt. In fact, the paper sack must be so light that the cost will be comparatively small to allow it to be discarded along with the dirt and dust after be-

ing used only once. In order to accomplish this result I have provided an intermediate pressure reducing apparatus which is adapted to be disposed between the vacuum cleaner bag and the porous sack, said reducing mechanism having a filter associated therewith through which a portion of the air escapes into the room, thereby reducing the pressure exerted on the paper sack.

It is another object of this invention to provide an intermediate pressure reducing filter of the class described with means for removing the dirt, dust and the like from the interior thereof.

It is a further object of the invention to provide a porous receptacle for receiving the contents of the conventional vacuum cleaner bag with means disposed between the bag and the receptacle for reducing the air pressure which is exerted on the bag and thus cause a minimum of air pressure within the porous receptacle.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

Figure 1 is an elevation showing an ordinary vacuum cleaner having my improved cleaning apparatus associated therewith;

Figure 2 is an isometric view of the intermediate pressure reducing filtering device which is disposed between the conventional vacuum cleaner receptacle and the porous depository bags for receiving the dirt after it is blown from the receptacle;

Figure 3 is a longitudinal sectional view through the filter as shown in Figures 1 and 2 and also showing the vacuum cleaner bag and the porous receptacle secured to the ends thereof;

Figure 4 is a vertical transverse sectional view taken along the line 4—4 in Figures 1 and 3;

Figure 5 is an isometric view of the inner cylinder of the pressure reducing filtering device.

Referring more specifically to the drawings, the numeral 10 denotes a standard electric type of vacuum cleaner which is supported by wheels 11 and 12. The vacuum cleaner has an exhaust pipe 14 to which is secured a porous bag 15 which holds accumulated dirt, dust and the like. This dirt and dust is collected from the floor or rug upon which the vacuum cleaner operates and is forced out through pipe 14 and into the receptacle 15. The receptacle 15 has an opening at its right hand end (Figure 1) said opening being normally closed by means of a spring clip 16 when the cleaner 10 is in operation. After much use, this receptacle 15 becomes partially filled with accumulated matter and it is neces-

sary to clean the interior portion thereof so that the efficiency of the vacuum cleaner will not be affected.

When it is desired to remove the accumulated matter from the receptacle 15 without polluting the surrounding air it is necessary to provide suitable filtering means whereby the objectionable matter will be retained in a suitable sack, but the air will be allowed to flow into the room when the vacuum cleaner 10 is placed in operation to blow the accumulated matter from the receptacle 15. In order to effectively accomplish this result, I have provided a pressure reducing filter 18 and a porous sack 21. One end of the pressure reducer 18 is secured to the open end of the receptacle 15 by any suitable means such as a spring clip 20. The portion of the open end of the receptacle 15 which is not disposed over one end of the pressure reducer 18 is adapted to be closed by the spring clip 16 in the manner shown in Figure 1. The other end of the pressure reducer 18 has the open end of a porous sack 21 secured thereover by any suitable means such as a frusto conical ring 22.

When the parts are hooked up in this manner shown in Figure 1 the motor of the vacuum cleaner 10 is placed in operation and the accumulated matter within the receptacle 15 is blown first through the pressure reducer 18 and into the porous sack 21. The object of the pressure reducer is to allow sufficient air to escape therefrom so that the draft, when it reaches the porous sack 21, will not be sufficient to damage it. This is very important because it is necessary to provide a very cheap and porous sack 21 for containing the exhausted dirt, dust and the like, so that it will not be necessary to use it over again. Instead, the sack, along with the accumulated matter, may be deposited in the trash can.

The specific structure of the pressure reducing filter member 18 is shown more clearly in Figures 3, 4 and 5. It is here seen that this member comprises an inner cylinder 25 having rings 26 and 27 secured on the ends thereof. The exterior periphery of the cylinder 25 is spun as at 28 and 29 for accommodating the supporting cradles 30 and 31 of wire racks 32. The cylinder 25 is also spun as at 33 and 34 for accommodating ribs 35 and 36 of inner cylindrical bands 37 and 38 respectively. Secured to the proximate ends of the inner band 37 and 38 is a cylindrical wire screen 39 which is rotatably mounted around the central portion of the cylinder 25.

It will be noted by observing Figures 3 and 5 that the central portion of the cylinder 25 is cut away leaving scraper or rib members 40 at spaced intervals. These ribs or scrapers 40 are adapted to contact the interior of the cylindrical wire screen 39. When the dust and dirt has accumulated on the interior of this screen the bands 37 and 38 as well as the screen 39 are rotated about the cylindrical member 25 to cause the scrapers 40 to remove the matter which has accumulated on the interior of the screen. With this matter removed the forced draft of air produced by the vacuum cleaner will blow the same into the porous bag 21.

The inner bands 37 and 38 have secured to their exterior peripheries suitable rings 42 and 43 respectively, said rings being adapted to support upon their outer peripheries a second set of cylindrical bands 44 and 45. Disposed between the proximate ends of the bands 44 and 45 is a cylindrical screen member 46. The annular

space between the screens 39 and 46 is adapted to be filled with a suitable filtering material such as oiled wood excelsior, metallic wool, or other suitable materials.

By providing the intermediate pressure reducer 18 the maximum air pressure is present within the vacuum bag or receptacle 15. When the pressure reaches the opening between the scraper members 40, a large portion thereof is allowed to escape through the cylindrical wire screens 39 and 46 and the filter material 47. The remaining draft produced serves to blow the material into the porous sack 21. Since this sack allows air to readily escape therefrom, the force of the reduced air current will not be sufficient to damage the sack; consequently a very cheap type of porous bag can be used for receiving the exhausted dirt, dust and the like.

By the use of the above method together with the air reducer as previously described and shown in the accompanying drawings, together with the porous paper container, it will be noted that all of the accumulated dirt and dust in the vacuum cleaner cloth bag is effectively disposed of and a person does not at any time come into contact with the accumulated dirt and dust. Also the air which is exhausted within the room is free from objectionable matter.

If a porous paper bag is used without the pressure reducing apparatus, not only would the paper bag have to be much stronger than that employed by me, but it would also have to be much more porous than the cloth receptacle of the vacuum cleaner, so as to offer less resistance to the air than the cloth receptacle, in order to cause the foreign matter to flow from the cloth receptacle into the paper bag. By the use of a pressure reducing apparatus between the cloth receptacle and the paper bag, it is evident that the strength of the paper bag can be greatly reduced. If the paper bag were too porous, then the air passing therethrough would carry dirt and the like through the bag and back into the room from whence it was removed.

In the drawings and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the appended claims.

I claim:

1. In combination a vacuum cleaner, a porous bag having one end secured to the discharge of said cleaner, a filter having one end secured to the other end of the bag, a porous receptacle secured to the other end of the filter, said filter permitting a substantial amount of the air from the bag to escape into the atmosphere and the remaining air to pass into the porous receptacle to carry the dirt and the like into said porous receptacle.

2. In combination, a vacuum cleaner, a porous bag having one end secured to the discharge of said cleaner, a filter having one end secured to the other end of the bag, a porous receptacle secured to the other end of the filter, the filter permitting a substantial amount of the air passing thereto to escape into the atmosphere and the remaining air to pass into the porous receptacle to carry the dirt and the like into the porous receptacle, and means for cleansing the interior walls of the filter while the same is in operation.

3. In combination, a vacuum cleaner having a porous bag into which the products of cleaning

are discharged, a filter having one end connected to the discharge end of the bag, a porous receptacle connected to the other end of the filter.

4. In combination, a vacuum cleaner having a porous bag into which the products of cleaning are discharged, a filter having one end connected to the discharge end of the bag, a porous receptacle connected to the other end of the filter, said filter allowing a substantial portion of the air discharged from the bag to pass into the atmosphere and the remaining portion to pass into the porous receptacle.

5. In combination a vacuum cleaner, a porous bag having one end secured to the discharge of said cleaner, a filter having one end secured to the other end of the bag, a porous receptacle secured to said other end of the filter, the filter permitting a substantial amount of the air from the bag to escape into the atmosphere and the remaining air to pass into the porous receptacle to carry the dirt and the like into the porous receptacle, said filter comprising inner and outer perforated walls spaced from each other and having filtering material disposed between the walls.

6. In combination a vacuum cleaner having a porous bag into which the products of cleaning are discharged, a filter having one end connected to the discharge end of the bag, a porous receptacle connected to the other end of the filter, said filter comprising inner and outer perforated walls spaced from each other and having filtering material disposed between the walls.

7. In combination a vacuum cleaner having a porous bag into which the products of cleaning are discharged, a filter having one end connected to the discharge end of the bag, a porous receptacle connected to the other end of the filter, said filter allowing a substantial portion of the air discharged from the bag to pass into the atmosphere and the remaining portion to pass into the porous receptacle, said filter comprising inner and outer perforated walls spaced from each other and having filtering material disposed between the walls.

8. In combination, a vacuum cleaner, a porous bag, having one end secured to the discharge of said cleaner, a filter having one end secured to the other end of the bag, a porous receptacle secured to the other end of said filter, said filter permitting a substantial amount of the air passing thereinto from the bag to escape into the atmosphere and the remaining air to pass into the porous receptacle to carry the dirt and the like into the porous receptacle, said filter comprising inner and outer perforated walls spaced from each other and having filtering material disposed between the walls, and means for dislodging dirt and the like from the surface of the inner wall to cause it to pass into the porous receptacle.

9. In combination a vacuum cleaner having a porous bag into which the products of cleaning are discharged, a filter having one end connected to the discharge end of the bag, a porous receptacle connected to the other end of the filter, said filter comprising inner and outer perforated walls spaced from each other and having filtering material disposed between the walls, and means for dislodging dirt and the like from the surface of the inner wall to cause it to pass into the porous receptacle.

10. In combination a vacuum cleaner having a porous bag into which the products of cleaning are discharged, a filter having one end connected to the discharge end of the bag, a porous receptacle connected to the other end of the filter, said filter allowing a substantial portion of the air discharged from the bag to pass into the atmosphere and the remaining portion to pass into said porous receptacle, said filter comprising inner and outer perforated walls spaced from each other and having filtering material disposed between the walls, and means for dislodging dirt and the like from the surface of the inner wall to cause it to pass into the porous receptacle.

11. In combination, a vacuum cleaning machine having a receptacle for receiving the results of cleaning, a filter secured to said vacuum cleaning receptacle and a second receptacle secured to said filter.

12. In combination, a vacuum cleaning machine having a receptacle for receiving the results of cleaning, a pressure reducing filter secured to the discharge end of said receptacle, a second receptacle secured to the end of the pressure reducing filter, said filter comprising inner and outer perforated walls spaced from each other and having filtering material disposed between the walls.

13. In combination, a vacuum cleaning machine having a receptacle for receiving the results of cleaning, a pressure reducing filter secured to the discharge end of the receptacle and a second receptacle secured to the other end of the pressure reducing filter, said filter comprising inner and outer perforated walls spaced from each other and having a filter material disposed between the walls, and means for dislodging dirt and the like from the surface of the inner wall to cause it to pass into said second receptacle.

14. In combination, a vacuum cleaner having a receptacle for receiving the products of cleaning, an air pressure reducing device secured to the discharge end of the receptacle, and a second receptacle secured to the other end of the air pressure device.

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