Aug. 17, 1965 J. C. SHUFFLEBOTHAM 3,200,571

DISPOSABLE FILTER BAG

Filed Aug. 30, 1961 2 Sheets-Sheet 1

Fig. 1

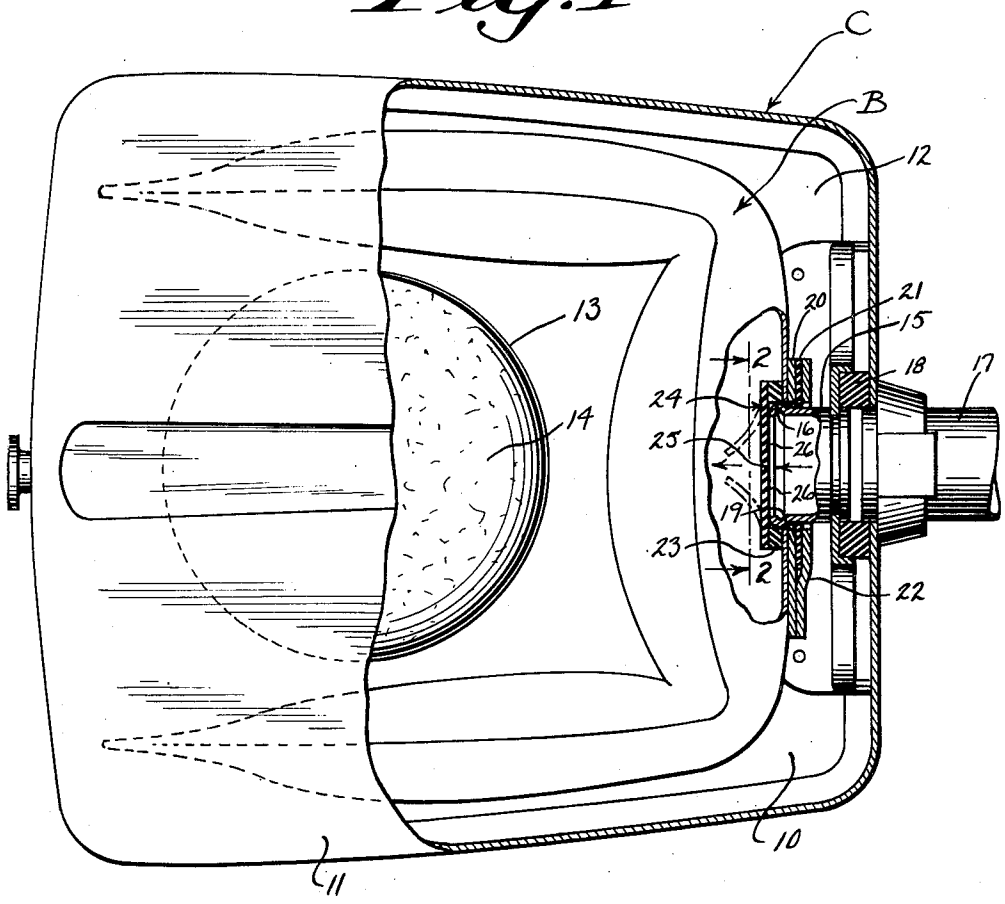
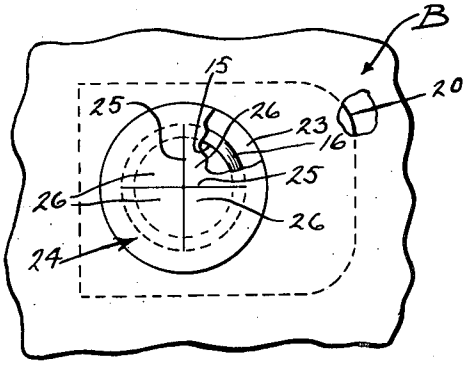


Fig. 2



INVENTOR
JAMES C. SHUFFLEBOTHAM

BY Wright & Wright

ATTORNEYS

Aug. 17, 1965 J. C. SHUFFLEBOTHAM 3,200,571

DISPOSABLE FILTER BAG

Filed Aug. 30, 1961 2 Sheets-Sheet 2

Fig. 3

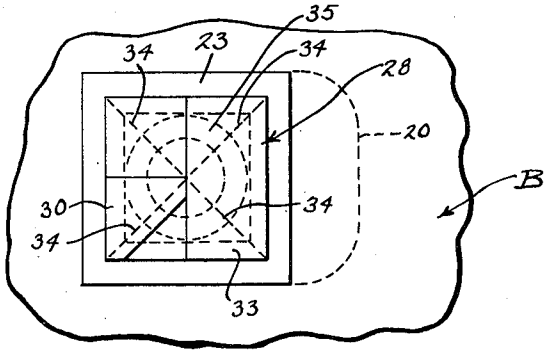


Fig. 6

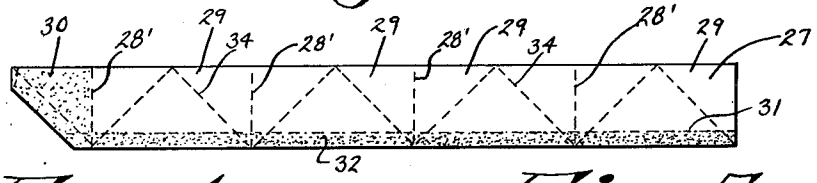


Fig. 4

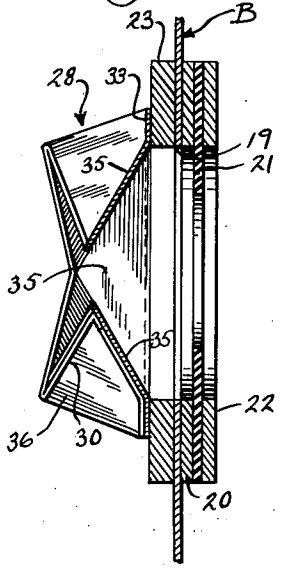
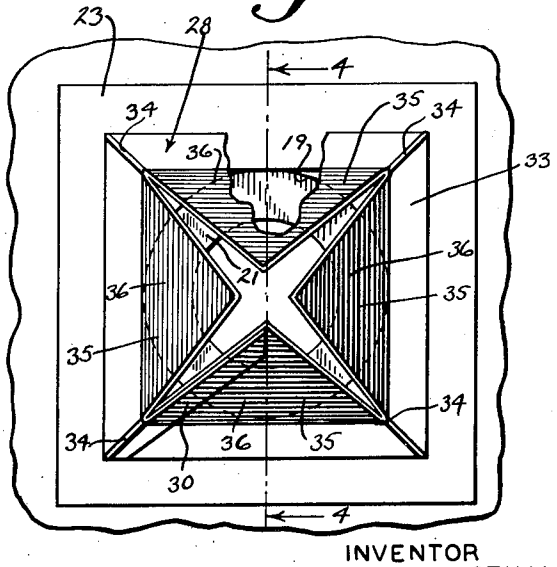


Fig. 5



INVENTOR
JAMES C. SHUFFLEBOTHAM

BY Wright & Wright

ATTORNEYS

United States Patent Office 3,200,571 Patented Aug. 17, 1965

3,200,571

DISPOSABLE FILTER BAG

James C. Shufflebotham, Milwaukee, Wis., assignor of one-half to Shannah Gale Stone, Milwaukee, Wis.

Filed Aug. 30, 1961, Ser. No. 135,018
2 Claims. (Cl. 55—367)

This invention appertains to vacuum cleaners and more particularly to the disposal dirt collection bags of vacuum cleaners.

In vacuum or suction cleaners, the disposal bags are provided with an entrance opening or neck for receiving the discharge tube of the cleaner. The collected dirt is either blown or sucked into the bag from the discharge tube of the cleaner. There is a slightly but constant seepage of dirt between the neck of the bag and the discharge tube and into the cleaner. This is particularly true where the bag is located in a suction chamber and the air is sucked through the bag and the discharge tube. The dirt seepage flows to the suction fan, necessitating a filter covering over the intake of the housing for the fan. This cover soon becomes clogged, requiring the frequent cleaning thereof. Likewise, in removing the bags from the cleaner for disposal, dirt drops from the neck of the bag and this brings about another housecleaning operation. This takes place even with careful handling of the bag.

It is, therefore, one of the primary objects of my invention to provide a disposable filter bag having a self-closing valve or slitted diaphragm for its neck which opens automatically when suction takes place, and closes automatically when suction ceases, whereby seepage of dirt from the bag is eliminated both when the bag is in the cleaner and when the bag is removed from the cleaner for disposal.

Another salient object of my invention is to provide a disposable bag for vacuum cleaners having associated therewith at the neck thereof an exterior flexible and resilient sheet ring for snugly embracing the discharge tube to aid the preventing of seepage, and an interior self-closing flexible and resilient valve or diaphragm spaced from the ring a sufficient distance, so that when the bag is placed on the cleaner tube the valve will be in a closed position, but ready for automatic opening when suction takes place.

A further object of my invention is to provide means for reinforcing the neck of the bag both on the inside and outside and around the entrance opening to prevent tearing of the bag during the placing and removing of the bag on and off the discharge tube and to use such reinforcement as the means for carrying both the flexible sheet ring which hugs the discharge tube and the self-closing dirt retaining valve or diaphragm.

A still further important object of my invention is to provide a novel means for forming the valve from paper to reduce cost, with the paper folded in such a manner as to give resiliency and flexibility so that the valve will automatically open and close.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described and claimed, and illustrated in the accompanying drawings, in which drawings,

FIGURE 1 is a top plan view of a vacuum cleaner of a standard make showing parts thereof broken away and in section to illustrate the association of my improved disposable bag with the discharge tube of the cleaner, the view showing the valve in its normal closed position in full lines and in its open position under suction in dotted lines;

FIGURE 2 is a fragmentary sectional view through

the disposable bag taken on the line 2—2 of FIGURE 1, looking in the direction of the arrows, and showing the construction of one preferred form of my self-closing valve;

FIGURE 3 is a view similar to FIGURE 2, but showing a modified form of the valve made from folded paper or the like;

FIGURE 4 is an enlarged transverse sectional view through the bag and the modified form of valve, as shown in FIGURE 3, the section being taken on the line 4—4 of FIGURE 5, looking in the direction of the arrows;

FIGURE 5 is a detail sectional view through the bag looking toward the self-closing valve made from the folded paper, the valve being shown in its partially opened position both in FIGURES 4 and 5, and

FIGURE 6 is a top plan view of the strip of paper from which the valve is made.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter B generally indicated my improved disposable bag for a vacuum or suction cleaner C.

The vacuum or suction cleaner C is of a well known make now readily available on the market, and hence the same will not be described in detail; however, it is to be noted that the vacuum cleaner C includes a casing 10 and a hinged cover 11. With the cover 11 in a closed position a sealed suction or vacuum chamber 12 is provided. Extending into the chamber 12 is a motor driven suction fan 13, and the intake of the fan is enclosed by a removable porous cover 14. Carried by the casing is a discharge tube or pipe 15 having formed on its inner end a reinforcing and stop rib 16. The cover 11 carries a coupling 17 for the vacuum cleaning tools and the cover is provided with a sealing gasket 18 around the inner end of the coupling for sealing engagement with the casing, and the discharge tube 15, so as to bring about an air tight seal connection.

The bag B is made from air porous dirt retaining paper and removably fits within the chamber 12. The bag as shown, is of the U-shape type and is provided with an entrance opening 19 in the central body portion thereof. My invention deals with the reinforcement of this opening and means for sealing the wall of the opening around the discharge pipe 18, and associating a self-closing valve with the opening.

To bring about the reinforcement of the bag around the opening and to space the discharge tube sealing means and my self-closing valve from one another, I utilize novel spacing members, as will now be set forth.

As best illustrated in FIGURE 1, I glue or otherwise secure to the outer face of the bag around the opening 19 a spacing and reinforcing plate or washer 20. For the sake of cheapness, this plate or washer can be formed from thick cardboard and can be glued or otherwise fastened to the bag. Glued or otherwise secured to the plate or washer 20 is a resilient flexible sheet of rubber or like material 21, and the outer face of the sheet has glued or otherwise secured thereto a reinforcing cardboard sheet 22. The plate or washer 20, the reinforcing plate 22 and sheet of rubber are all provided with openings in direct alignment with the opening 19 in the bag, but it is to be noted that the flexible sheet 21 extends a material distance inward of the edges of the openings of the members 20 and 22. In actual practice, the rubber sheet, which constitutes a sealing ring, is secured between the members 20 and 22 to form a unit and the unit is then glued to the outer face of the bag. Glued or otherwise secured to the inner face of the bag around the opening 19 is a thick cardboard spacing washer 23 and glued or

otherwise fastened to the spacing washer 23 is the self-closing valve 24.

In FIGURES 1 and 2, I have shown this valve as being formed from a single sheet of flexible resilient material, such as rubber, and this sheet is slit, as at 25, to provide a number of flexible resilient leaves 26. While I have shown the slits 25 as of a cruciform, it is to be understood that the sheet can be slit in other manners, as long as flexible leaves 26 are provided.

Due to the resiliency of the material from which the valve is formed, the leaves 26 are normally held in a closed position.

In associating the bag with the cleaner, the cover 11 is raised, the bag is placed in the chamber 12 and the discharge tube 15 is inserted within the bag opening 19. As the discharge tube 15 is of a greater diameter than the resilient sheet ring 21, the ring snugly engages the outer surface of the discharge tube and snugly fits around the bead formed on the discharge tube. The valve is disposed inward, but in close proximity to the inner end of the discharge tube 15, and hence the valve does not engage the discharge tube and is normally held in a closed position, by its inherent resiliency. Thus, the bag is not held on the discharge tube by the valve, but in contradistinction is held on the discharge tube by the flexible resilient sheet ring 21.

With the valve closed, leaking of dirt out of the bag is prevented. When the machine is in operation and suction takes place in the chamber 12 and through the bag B, the leaves 26 are drawn open and air and dirt is readily discharged directly into the tube. As soon as the suction ceases, the leaves 26 return to their normal closed sealing position and leakage of dirt out of the bag is prevented.

Obviously, when the bag is pulled off of the discharge tube the leaves 26 will continue in their closed position and any leakage of dirt out of the bag is prevented. Thus, the bag can be readily handled and be thrown away without danger of dirt dropping through the bag opening.

Thus, it can be seen that I do not rely on the valve for gripping the discharge tube and again, the valve is normally in a closed position and the bag is held on the discharge tube by the flexible resilient sheet ring 21.

In view of the fact that the bags are not reusable, it is imperative that inexpensive material be used in conjunction with the bags, and in lieu of forming the valve from sheet rubber, as shown in FIGURES 1 and 2, it may be desirable to form the valve from paper. This is shown in FIGURES 3 to 6, inclusive. In order to add flexibility and resiliency to the valve when formed out of paper, the paper can be folded to increase resiliency. In FIGURE 6, I have shown a blank 27 from which a folded paper valve 28 can be made. The blank 27 consists of a stretch of paper divided by transverse score lines 28' into equal sections 29. One end of the stretch is provided with a folded securing tab 30 and this tab is provided with adhesive on one face thereof. Extending longitudinally of the strip adjacent to one edge thereof is a weakened line 31 and one face of the sheet between the weakened line and its closest longitudinal edge is provided with an adhesive 32 and this portion is adapted to be folded outwardly to provide a securing lip 33. The sections 29 are provided with diagonally extending score lines 34 and these score lines extend outwardly from a central point in each section toward the lower edge of each section. The sections are folded on the score lines 28' to provide four wall sides 35 for the valve, and the wall sections are folded on the

diagonal lines 34 to give a desired thickness and to provide the flexible leaves 36. The flexible leaves are normally maintained in a closed position, as shown in FIGURE 3 by their inherent resiliency. Obviously, when suction takes place, the leaves will be moved outwardly, and when suction ceases the leaves are returned to their normal position.

By referring to FIGURES 3, 4 and 5 it can be seen that with the glued lip 31 secured to the spacing washer 23 the folded valve extends around the opening in the bag. Likewise, this valve is spaced from the resilient flexible sheet ring 21.

It is to be understood that other suitable and selected materials other than paper can be used to form the folded valve structure.

While I have shown my flexible valve structure utilized in conjunction with disposable bags for vacuum cleaners, it can be readily understood that the self-closing valve can be used in conjunction with other devices.

Various changes in details may be made without departing from the spirit or the scope of this invention, but what I claim as new is:

1. A disposable dust bag for vacuum cleaners comprising a body of relatively porous pliable material having an inlet opening of a size and configuration to snugly receive a discharge tube of a vacuum cleaner, exterior and interior reinforcing members secured to the inner and outer surface of one wall of the body around the opening, each reinforcing member having aligned openings of substantially the same size and configuration as the wall opening, a flexible sealing ring carried by the exterior reinforcing member and extending inwardly of the inner edge of the reinforcing member having an opening in alignment with the openings of said reinforcing members but of a substantially smaller diameter than the outer dimensions of the discharge tube for gripping contact with a discharge tube of a vacuum cleaner, and a self-closing valve member secured to the inner reinforcing member and spaced a material distance from the sealing ring, said valve member being formed from a sheet of resilient flexible material, said sheet being slit to provide flexible leaves, whereby upon the placing of a bag on a discharge tube of a vacuum cleaner the walls of said flexible sealing ring will be squeezed between the respective portions of the reinforcing members and the discharge tube the self-closing valve member will be spaced from the inner edge of said discharge tube and not affected thereby so that the valve will be maintained in its normal closed position.

2. A disposable dust bag for vacuum cleaners as defined in claim 1, and said valve member being formed from a blank of sheet material and folded to provide resilient leaves normally disposed in a closed position and with their adjacent edges in abutting relation.

References Cited by the Examiner

UNITED STATES PATENTS

1,422,105	7/22	Kirby	55—376 X
2,039,741	5/36	Richards	55—367 X
2,283,835	5/42	Weaver	55—367 X
2,528,332	10/50	Bercquist	55—367 X
2,566,275	8/51	White	55—367
2,574,683	11/51	Anderson	55—367
2,596,806	5/52	Borkoski	55—367
2,848,062	8/58	Meyerhoefer	55—367

HARRY B. THORNTON, *Primary Examiner.*