

Dec. 13, 1960

J. BARTOS ET AL
DISPOSABLE DUST CONTAINERS

2,964,128

Filed March 9, 1959

3 Sheets-Sheet 1

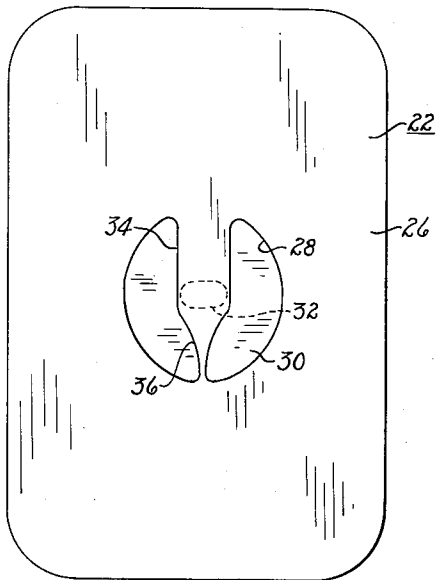


Fig. 1

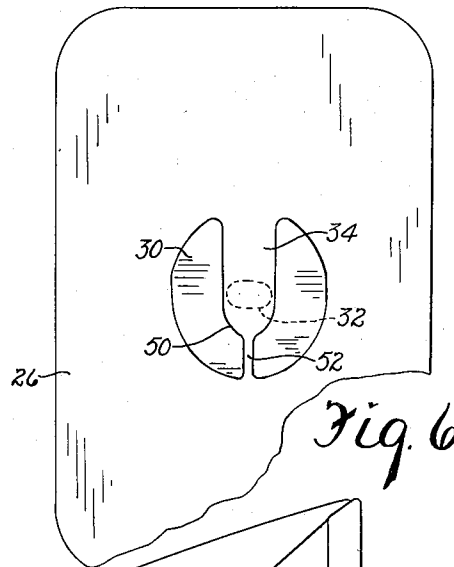


Fig. 6

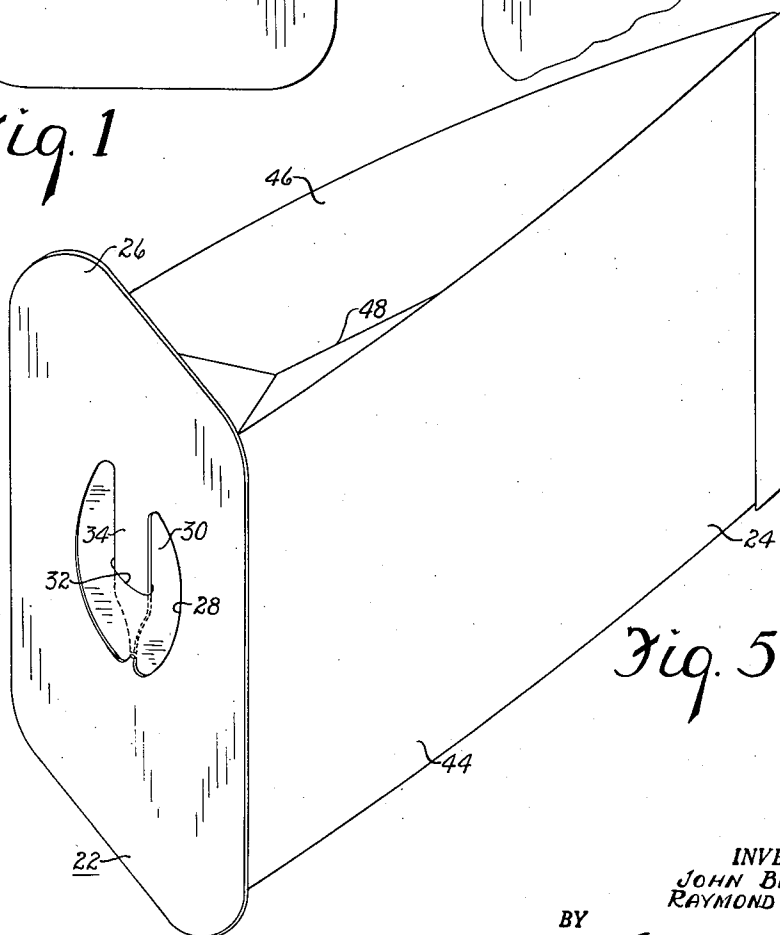


Fig. 5

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Fig. 3

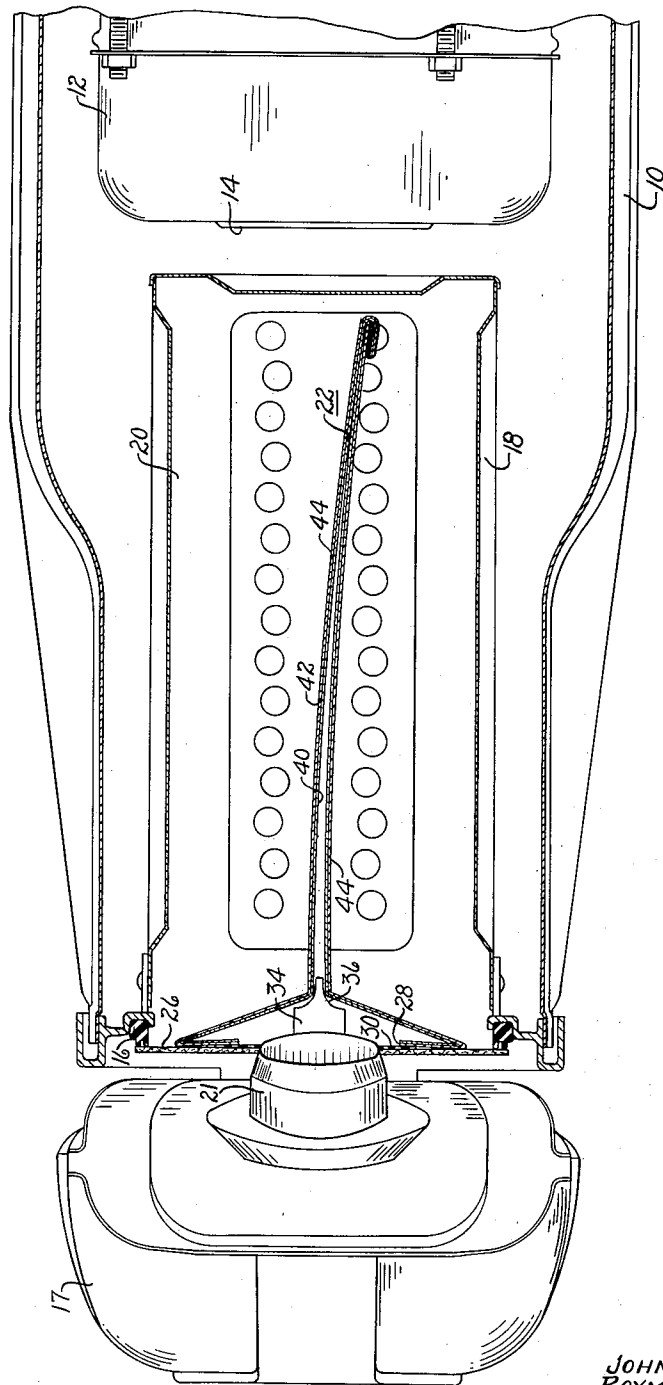
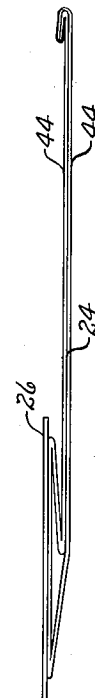


Fig. 2



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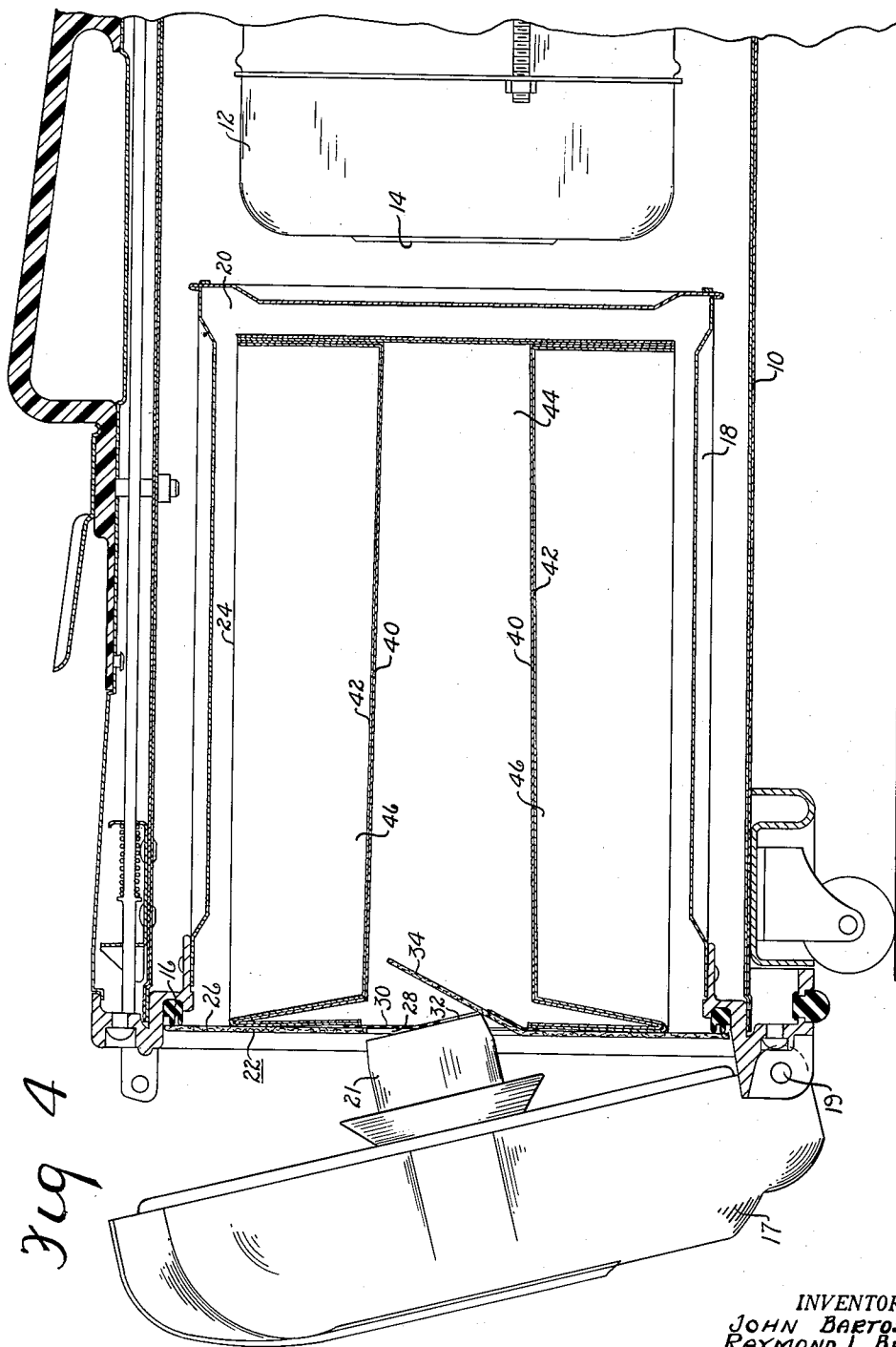
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3 Sheets-Sheet 3



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2,964,128

DISPOSABLE DUST CONTAINERS

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1 Claim. (Cl. 183—51)

Our invention relates to vacuum cleaners and more particularly to the enclosed bag type of cleaner in which the bag is made of disposable material, such as paper.

In Patent No. 2,596,808, issued May 13, 1952, to G. E. Lofgren there is disclosed a vacuum cleaner of this type having a paper dust bag which may be folded flat for storage before use and which is provided with an arrangement for substantially sealing the inlet to the bag in order to prevent spilling of dirt when the bag is removed from the cleaner. This seal comprises a sheet of flexible material, such as sheet rubber secured over the inlet opening of the bag, the sheet being provided with a comparatively small aperture which is stretched sufficiently to accommodate the inlet conduit of the cleaner when the bag is in place in the latter. When the bag is removed the aperture in the rubber sheet returns to its original small size in order to restrict the escape of dirt. In addition, the bag is provided with a sealing strip of cardboard or the like which initially extends across the opening and the aperture. Near one end this strip is provided with a weakened frangible section which is broken when the inlet conduit is introduced into the inlet opening of the bag, the strip being pushed by the conduit through the enlarged aperture in the rubber sheet. When the inlet conduit is withdrawn preparatory to removal of the bag, the strip remains inserted through the aperture in the rubber sheet, thus substantially closing it.

In Patent No. 2,804,166, issued August 27, 1957, to Henry W. Stevens et al., there is disclosed a bag similar to that shown in the Lofgren patent, except that it includes an inner liner of a sheet material, such as cellulose wadding which has greater porosity and greater thickness than the paper of the outer bag. The purpose of this liner is to provide a filter in depth which serves to intercept a large proportion of the finer dust particles, which if allowed to find their way to the inner surface of the outer bag, would rather quickly clog the pores of this paper.

However, wadding material of this nature is necessarily much weaker and more easily torn than the paper used for the outer bag and it has been found in practice that when a bag of the type shown in the Stevens patent, and provided with the seal shown in this patent as well as in the Lofgren patent, is placed in a cleaner without the bag first being opened up, insertion of the inlet conduit may cause the sealing strip to tear the liner when it is pushed into the bag through the aperture in the rubber sheet. If this occurs, fine dust picked up during the subsequent operation of the cleaner may find its way through the torn liner directly to the inner surface of the outer bag, thus reducing the beneficial effect of the liner.

Accordingly, it is an object of our invention to provide a dust container of this type in which the danger of tearing the liner is eliminated or substantially reduced. This is accomplished by altering the shape of the sealing strip without reducing its effectiveness as a seal.

Further objects and advantages of our invention will

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be apparent from the following description considered in connection with the accompanying drawings, which form part of the specification and of which:

Fig. 1 is a front view of a dust container in accordance with one embodiment of our invention;

Fig. 2 is a side view of the dust container shown in Fig. 1;

Fig. 3 is a cross-sectional view of a portion of a vacuum cleaner containing the dust container of Figs. 1 and 2, and with the cover in partially closed position;

Fig. 4 is a cross-sectional view of the cleaner and dust container shown in Fig. 3, but taken in a plane at right angles thereto;

Fig. 5 is a perspective view of the dust container shown in the preceding figures after it has been removed from the cleaner; and

Fig. 6 is a front view of a dust container, similar to Fig. 1, but showing a second embodiment of our invention.

Referring to the figures, reference character 10 designates generally a vacuum cleaner casing in which is mounted a motor-fan unit 12 having an inlet opening 14. The left-hand end of casing 10, as viewed in Figs. 3 and 4, is formed with an opening surrounded by a gasket 16. An inner perforated body 18 is mounted within the casing 10 and forms a dust bag receiving space 20, access to which may be had through the opening surrounded by the gasket 16.

A cover member 17 is pivotally mounted at 19 to the casing 10 in a position to close the opening to the space 20. This cover carries an inlet conduit 21 which, when the cover is closed, extends into space 20.

Reference character 22 designates generally a dust container of the general type shown in the above mentioned patent to Stevens. This container includes a bag portion 24 having a rectangular end to which is secured a stiff disc member 26 of cardboard or the like. This disc is formed with a centrally located inlet opening 28 which is normally covered by a sheet of flexible material 30 such as rubber. This sheet is formed with a normally small centrally located aperture 32. A sealing strip 34 extends across the opening 28 and has its opposite ends secured to the disc 26 at opposite sides of the opening. As here shown, this strip is integral with the material of the disc, but could be a separate strip of cardboard or the like as shown in both the patents to Lofgren and Stevens. As appears from Fig. 1, the portion of this strip from one end thereof to just beyond the aperture 32 has a width slightly greater than the normal dimension of the aperture. From this point the opposite edges of the strip are concave, as indicated at 36, thus causing the width of the strip to decrease to a minimum immediately adjacent the other side of the opening 28 in the disc. This minimum width results in the strip having a weakened frangible portion which may be easily severed, as will appear hereinafter.

As appears from the cross-sectional views shown in Figs. 3 and 4, the bag portion 24 of the dust container comprises an inner liner 40 in the form of a sheet of pliable cellulose wadding or the like and an outer bag portion of pliable porous paper 42. As explained above and in still more detail in the Stevens patent, the purpose of the wadding is to intercept fine dust particles before they reach the inner surface of the bag 42. In order to prevent the passage therethrough of fine dust particles the outer bag 42, while being porous for the passage of air, must have very fine passages therethrough, and if all of the fine dust picked up by the cleaner were to reach the surface of the bag 42 these passages would quickly become clogged, thus increasing the pressure drop of the air through the bag. By providing a wadding, which is more porous than the outer

paper but which has a greater thickness, much of this fine dust is intercepted and retained thereby. However, this wadding material is weak and easily torn, but is normally supported by the much stronger outer paper 42, which is of sufficient strength to withstand the bursting pressure when the bag is inflated during use.

The bag portion 24 of the dust container 22 is provided with opposite pairs of side walls 44 and 46, one wall of each pair being shown in Fig. 5. The walls 46 are each formed with a longitudinally extending crease line 48 by virtue of which the walls 46 may be folded flat between the walls 44, as is shown in Fig. 2. Also, the discs 26 may be folded parallel to the walls and in this condition the bags occupy a minimum of space and consequently they are stored in this manner. Each of the side walls 44 and 46 is formed with an extension at one end which extends at right angles to the respective wall when the bag is expanded, these extensions forming the rectangular end to which the disc 26 is secured.

When a new bag is to be placed in the cleaner the cover 17 is hinged to open position, thus permitting the bag to be introduced through the opening into the space 22, the disc 26 of the bag seating on the gasket 16. Prior to inserting the bag it should be partially expanded or opened up, which may be done by holding the disc in one hand and pulling the opposite end of the bag. If this is done the bag will assume approximately the condition shown in Fig. 5. However, many users neglect to do this, but place the bag in the cleaner still in the folded condition with the walls 44 close to each other, as shown in Fig. 3. When the cover is pivoted to closed position, the inlet conduit 21 contacts the strip 34 and breaks it at its weakened portion. At the same time, the inlet conduit stretches the rubber sheet 30 so as to enlarge the opening 32 therethrough and starts to enter this enlarged opening, pushing the strip 34 ahead of it. As is shown particularly in Fig. 3, the inner end of this strip tends to rub against the inner liner of the closely spaced walls 44, and if the strip were of the same width throughout substantially its entire length, as is the case in the bags shown in both the Lofgren and Stevens patents, the edges of the inner end of the strip would be very apt to tear the liner, thus forming a hole therethrough. However, in accordance with the present invention the free end of the strip is narrowed from a point immediately beyond the aperture 32 so that it may pass between the closely adjacent walls of the still folded bag with a minimum chance of injuring the inner liner, as is clear from Fig. 3.

Once the cover is fully closed and the vacuum cleaner motor started so as to produce a current of air through the inlet conduit and through the bag to the inlet 14 of the fan, this air inflates the bag to a shape approximating that shown in Fig. 5 and consequently the side walls are

moved outwardly and away from any possible contact with the inwardly extending strip 34.

When it is desired to dispose of the bag and its contents, the cover is pivoted to open position, thus withdrawing the inlet conduit from the bag. This permits the aperture 32 in the rubber sheet to return to its normal small size, but the free end of the strip 34 remains within the bag, as is illustrated in Fig. 5. As will be seen from this figure the strip is of full width where it passes through the aperture and the portion of reduced width is entirely within the bag. Consequently, the strip substantially seals the aperture 32, thus preventing the accidentally spilling of dirt therefrom when the bag is removed.

The embodiment illustrated in Fig. 6 is the same as that previously described, with the exception that the narrow portion of the strip 34 is obtained by making the edges thereof converge immediately beyond the edge of the opening 32, as is indicated at 50, and thence extend parallel to each other to provide a narrow portion 52. When used in the vacuum cleaner in the manner illustrated in Figs. 3 and 4, this embodiment has the same advantages as that previously described.

While we have shown two more or less specific embodiments of our invention, it is to be understood that this has been done for purposes of illustration only and that the scope of our invention is not to be limited thereby, but is to be determined from the appended claim.

What we claim is:

30 A disposable dust container for a vacuum cleaner including a collapsible and expandable bag portion comprising an outer bag composed of pliable porous paper of porosity to permit the passage of air but to preclude the passage of dust particles therethrough and of sufficient strength to resist the bursting pressure resulting from the pressure drop of the air passing through the bag, a liner bag within said outer bag composed of pliable fibrous material having greater porosity and thickness than said paper, said bags being formed with an inlet opening, a sheet of stretchable elastic material secured across said opening and having an aperture normally smaller than said opening, and a flexible strip member secured at each end at opposite sides of said opening and extending over said aperture, said strip being at least 45 wide enough, from one end thereof to a location immediately beyond said aperture, to cover said aperture, the sides of the strip curving inwardly from said location until they join a narrow frangible portion forming the other end of the strip.

References Cited in the file of this patent

UNITED STATES PATENTS

2,596,808	Lofgren	May 13, 1952
2,804,166	Stevens et al.	Aug. 27, 1957
2,813,596	Voightman et al.	Nov. 19, 1957