Jan. 31, 1956 F. A. GALL 2,732,911

DISPOSABLE DUST BAGS FOR VACUUM CLEANERS

Filed Jan. 28, 1952

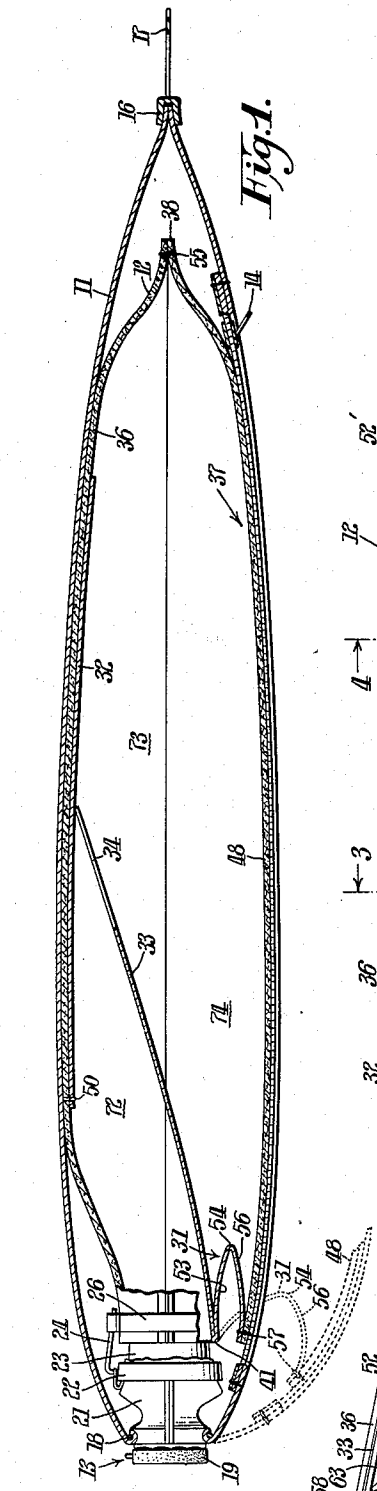


Fig. 1.

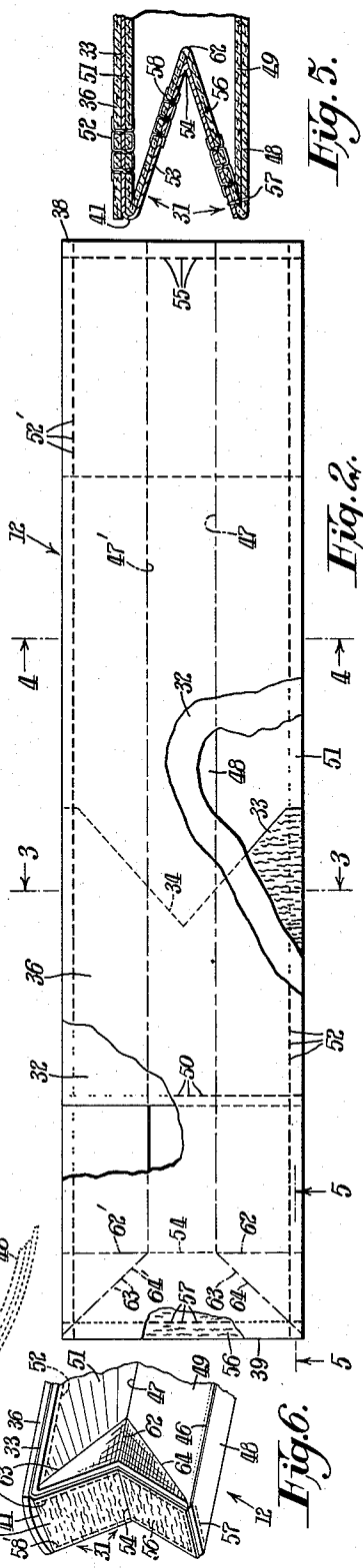


Fig. 2.

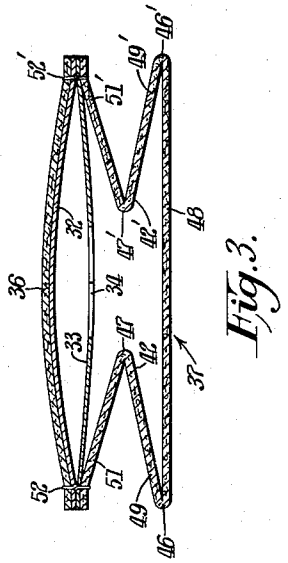


Fig. 3.

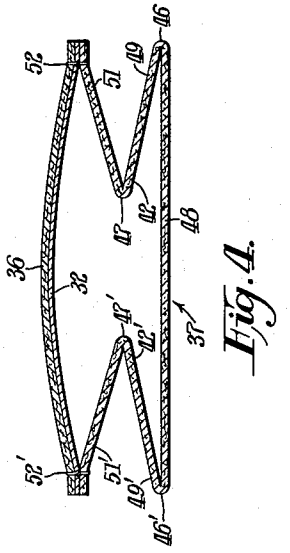


Fig. 4.

Fig. 5.

Fig. 6.

WITNESS

William Martin

INVENTOR.

Francis A. Gall

William P. Stewart

ATTORNEY

United States Patent Office 2,732,911 Patented Jan. 31, 1956

2,732,911

DISPOSABLE DUST BAGS FOR VACUUM CLEANERS

Francis A. Gall, Springfield, N. J., assignor to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

Application January 28, 1952, Serial No. 268,595

1 Claim. (Cl. 183—51)

This invention relates to dust bags for vacuum cleaners and more particularly to improvements in inner disposable dust bags that are ordinarily enclosed in outer appearance bags, and one of the primary objects of the present invention is to provide a superior article of this character.

Another object of the invention is to provide a comparatively inexpensive inner vacuum cleaner bag which can be discarded when filled with dirt.

A still further object of the invention is to provide an inner disposable bag that is capable of expanding to accommodate a large amount of collected dirt.

With the above and other objects in view, as will hereinafter appear, the invention consists in the devices, combinations, and arrangements of parts hereinafter described in connection with the accompanying drawings, which illustrate a preferred embodiment of the invention and in which:

Fig. 1 is a sectional view of an outer appearance bag housing an inner disposable bag which forms the subject of the present invention,

Fig. 2 is a partly cut away plan view showing the uninflated inner disposable bag before installation in the outer appearance bag,

Fig. 3 is an enlarged sectional view on the line 3—3 of Fig. 2,

Fig. 4 is an enlarged sectional view on the line 4—4 of Fig. 2,

Fig. 5 is an enlarged, fragmentary sectional view on the line 5—5 of Fig. 2, and

Fig. 6 is a perspective view showing one end of the disposable bag.

The vacuum cleaner dust bag illustrated in the accompanying drawings includes a conventional outer appearance bag 11 and an inner disposable bag 12, the inlet ends of the two bags being adapted to be connected to the exhaust duct of a vacuum cleaner (not shown) by means of a connector sleeve and clamp, indicated generally by the numeral 13. Since vacuum cleaner bags of the type herein described are normally supported in an inclined position with their inlet ends below their closed ends, the inlet ends of the bags, as well as the inlet ends of the various other parts, will be termed the lower ends, and the ends remote from the inlet will be termed the upper ends.

The outer appearance bag 11, preferably, is manufactured from a single piece of loosely woven pervious material, and the longitudinal edges of the pervious material are joined by a slide-fastener 14. The upper or closed end of the outer bag 11 is engaged by a conventional clamp 16 which is connectible to a vacuum cleaner handle (not shown) by a bail 17.

The connector-sleeve and clamp 13 forms the subject of a patent application, Serial No. 186,968, filed September 27 1950, now Patent No. 2,692,781, and thus need not herein be described in detail. Suffice it to say that the inlet end of the outer appearance bag 11 is secured by a wire 18 to a vacuum cleaner bag connector 19 that may be a duplicate of the bag connector described in U. S. Patent No. 2,523,739. The same wire 18, that

secures the outer bag 11 to the connector 19, also secures the lower divergent or inlet end of a substantially frustoconically shaped flexible plastic tube 21 to the connector 19. The outlet or convergent upper end of the tube 21 is secured by a clamp-band 22 to the inlet or lower flanged end of an oval shaped, preferably aluminum tube 23. An intermediate portion of the band 22 pivotally supports one end of an L-shaped lever or bracket 24. The free end of the L-shaped bracket 24 pivotally supports the ends of two half clamping bands indicated generally by the numeral 26, the free ends of the band parts being joined by a trunk latch (not shown).

The inner disposable bag 12, which forms the subject of the present invention, is similar in many respects to the disposable bag which is the subject of a co-pending patent application, Serial No. 192,314, filed October 26, 1950, now Patent No. 2,637,409; the main difference between the two bags being that the disposable bag of the present invention is provided with a laterally extending inturned expansion pleat 31 having two leaf panels hereinafter described, a protecting shield 32, and a trap-member 33 having at its upper end a downwardly pointed V-shaped notch 34, whereas the bag of the above referred to patent application does not have these features.

In addition to the aforementioned expansion pleat 31, shield 32, trap-member 33 and V-cut 34, the inner disposable bag includes the following major elements: viz, a pervious wall-member 36, a pervious wall-member 37, an upper or closed end 38 and a lower or open inlet mouth 39. Preferably the pleat 31 and the trap-member 33 are formed from a single piece of kraft paper, the pleated portion 31 beginning at a fold 41 where the trap portion 33 ends.

Both the wall member 36 and the wall-member 37 are made from strips of pervious material, the former having a width equal to the lateral width of the bag, and the latter being considerably wider and having its side margins infolded to form longitudinally extending pleats 42 and 42'. These pleats are formed by infolding the pervious wall-member 37 at 46—46' and outfolding the wall-member 37 at 47—47' to form accordion folds. The folds 46 and 47, and 46' and 47' cause the wall-member 37 to have a panel 48, two inwardly hinged leaf-panels 49 and 49', as well as two outwardly hinged leaf-panels 51 and 51'. The wall-member 37, when completely folded, is coextensive with the wall-member 36, and positioned in such a manner that the free longitudinal external edges of the leaf-panels 51 and 51' are joined by straight parallel lines of stitches 52 and 52' to opposite edges of the longitudinal wall-member 36. The upper end 38 of the disposable bag is closed by a line of stitches 55. When the disposable bag is assembled, two separate sheets of paper are inserted between the pervious members 36 and 37. One of these, the protecting shield 32 is formed from a reinforcing sheet of manila paper. This shield 32, which is held in place by a transverse line of stitches 50 and lines of stitches 52—52', is approximately one-half as long as the length of the disposable bag and as wide as the pervious member 36, which width determines the width of the disposable bag. This shield 32 is positioned midway between the ends of the disposable bag, thus leaving approximately one-quarter of the bag length extending beyond the upper and lower ends of the shield 32.

The upper end of the trap-member 33 is positioned at a location that is approximately midway between the top end and the bottom end of the disposable bag. This upper end of the trap-member 33 is notched by a V-cut as shown at 34, the depth of the V-cut preferably being equal to substantially one-half the width of the disposable bag. As previously indicated, the lower end of the trap-member 33 terminates at the fold line 41 at which location a first leaf-panel 53 of the pleat 31 begins. The leaf-

panel 53 ends at a fold line 54 at which line a second leaf-panel 56 of the pleat 31 begins. The second leaf-panel 56 ends on a line that is coextensive with the lower end of the panel 48. The lower end of the panel 56 is secured to the pervious wall-member 37 by a line of stitches 57. Also one side edge of the panels 53 and 56 is joined to the infolded ends of the panels 49 and 51 by a line of stitches 58. In like manner the other side edge of the panels 53 and 56 is joined to the infolded ends of the panels 49' and 51' by means of a line of stitches 58'.

In order that the lateral pleat 31 may extend the complete width of the disposable bag, the lower end of the two longitudinal pleats 42 and 42' are back folded ninety-degrees on laterally extending fold lines 62 and 62'. Infolding of pleat 42, to provide the laterally extending fold 62, forms a pair of diagonal folds 63 and 64. In like manner, infolding of pleat 42', to provide the laterally extending fold 62', forms a pair of diagonal folds 63' and 64'. Reference to Figs. 5 and 6 shows that the lateral fold 62 joins the diagonal folds 63 and 64 and all three of these folds meet at a point at which the longitudinal fold 47 ends. The same construction is provided at the other side of the bag where fold 62' joins the diagonal folds 63' and 64' at a point where the longitudinal fold 47' ends.

Reference to the drawings and especially to Fig. 1 shows that the trap-member 33 defines with the lower portion of the wall-member 36 and the lower portion of the shield 32, an entrance passageway designated by the numeral 72. The upper ends of the wall-member 36 and the upper end of the shield 32 on one side, and the upper end of the wall-member 37 on the other side, define a dirt filtering cavity or pocket 73. The lower end of the wall-member 37, the lower end of the trap-member 33 and the two panels 53 and 56 of the transverse pleat 31 define a dirt collecting pocket or cavity 74.

When being used, the inner disposable bag 12 is placed within the outer bag 11 and the bag 12 is attached to the aluminum tube 23 by means of the two-part clamp band 26. Then the slide fastener 14 is closed and the bag is ready for use. Dust and dirt from the vacuum cleaner enters the plastic tube 21, passes through the aluminum tube 23 and into the passageway 72, from whence it passes through the V-cut 34 into the dirt filtering cavity 73. In doing this the dirt and dust carried by the air stream from the vacuum cleaner impinges against the shield 32 which protects the pervious wall-member 36 from damage. The dirt and dust is retained in the disposable bag 12, while filtered air passes through the pervious wall 36, and the panels 48, 49—49' and 51—51' of the pervious wall-member 37. Since the outer and inner bags are supported in a vertical position by the vacuum cleaner handle (not shown), the dirt and dust will settle from the cavity 73 into the collecting cavity 74. This assures that the upper portions of the walls 36 and 37 will remain relatively clean, thus maintaining their ability to act as filters. As the quantity of dirt in the pocket 74 increases, it presses on the inturned pleat 31 with the result that the pleat 31

as well as the side pleats 42 and 42' expand, thus greatly enlarging the capacity of the pocket 74 and making it possible to use the disposable bag for a long period of time.

Having thus set forth the nature of the invention, what I claim herein is:

A disposable dust-bag comprising a first pervious rectangular wall-member formed as a single piece of flat material having two parallel longitudinal edges and top and bottom short edges normal to the longitudinal edges; a second pervious wall-member formed from a single piece of material infolded and outfolded on two sides to a size which is the same as and coextensive with said first wall-member, said infolding and outfolding forming two pleats each having two leaf-panels extending parallel to the longitudinal edges of said first wall-member; a shield extending one half the length of said first wall-member and positioned mid-way between the top and bottom edges of said first wall-member; a trap-member coextensive with substantially the lower half of said first wall-member and positioned between said wall-members, said trap-member being the same width as said first wall-member and having a lower end, said trap-member also having at its upper end a downwardly pointed V-shaped notch; means securing the longitudinal edges of said wall-members together and at the same time securing said shield and said trap-member between said wall-members, thereby forming an entrance passageway between said trap-member and said first wall-member, a filtering cavity between said first and second wall-members, and a collecting pocket between said trap-member and said second wall-member; an upfolded transverse leaf-panel formed as an integral part of the lower end of said trap-member and joined thereto along a transverse line; a downfolded transverse leaf-panel formed as a continuation of said upfolded transverse leaf-panel and joined thereto along a transverse fold line, said downfolded transverse leaf-panel also being secured to the lower end of said second wall-member; and means for joining the lower end of said longitudinally extending leaf-panels to the edges of said transverse leaf-panels, thereby forming an inturned expansion pleat extending laterally of the dust-bag and closing the lower end of said collecting pocket.

References Cited in the file of this patent

UNITED STATES PATENTS

1,753,458	Willis	Apr. 8, 1930
1,859,861	Ballou	May 24, 1932
1,924,249	Marshall	Aug. 29, 1933
1,970,043	Kern	Aug. 14, 1934
2,024,143	Cameron	Dec. 17, 1935
2,179,126	Klotz	Nov. 7, 1939
2,187,052	Poynter	Jan. 16, 1940
2,308,682	Fuge	Jan. 19, 1943
2,364,069	Hahn	Dec. 5, 1944
2,562,499	Lifton	July 31, 1951
2,577,863	Sosnowich	Dec. 11, 1951
2,637,409	Turner et al.	May 5, 1953