

May 5, 1953

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2,637,409

DISPOSABLE DUST BAG FOR VACUUM CLEANERS

Filed Oct. 26, 1950

2 SHEETS—SHEET 1

Fig. 1.

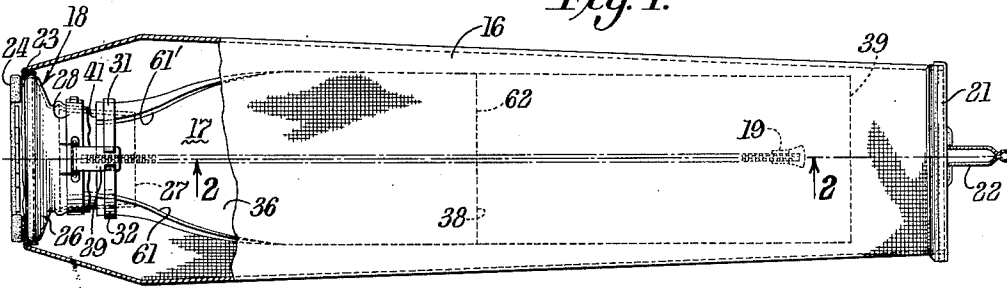


Fig. 2.

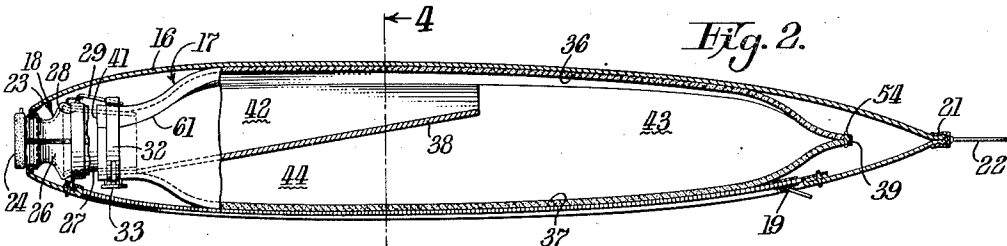


Fig. 3.

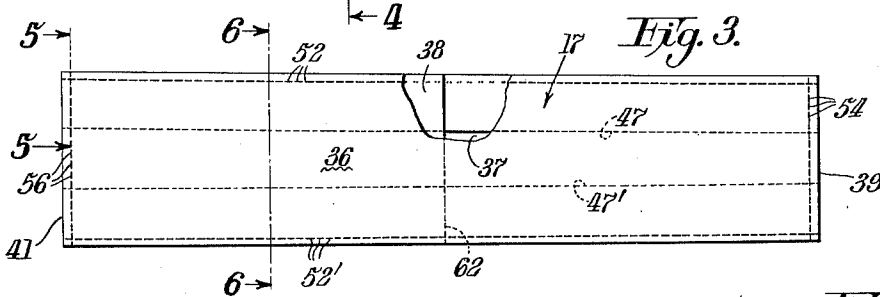


Fig. 4.

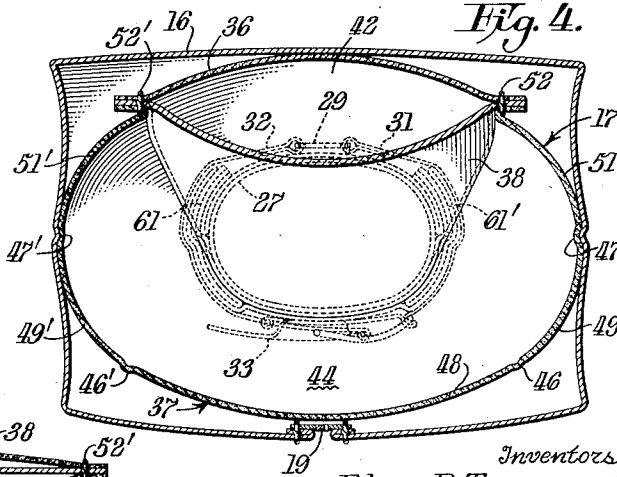


Fig. 5.

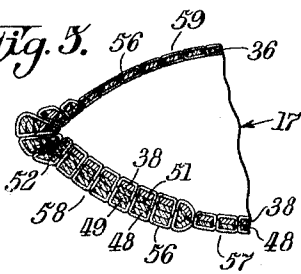
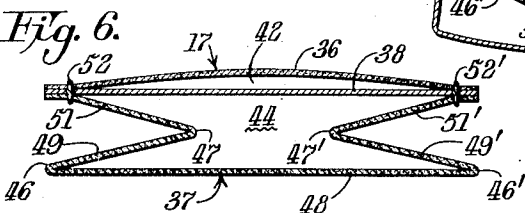


Fig. 6.



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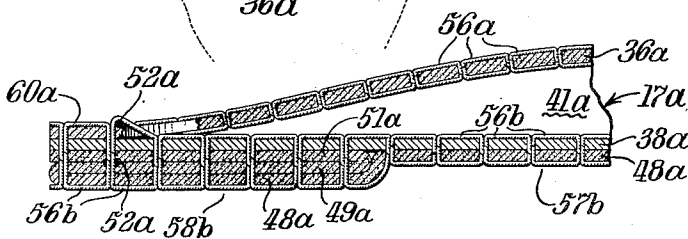
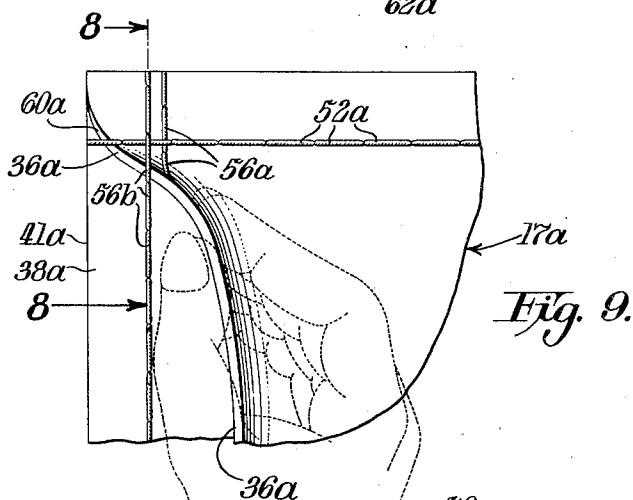
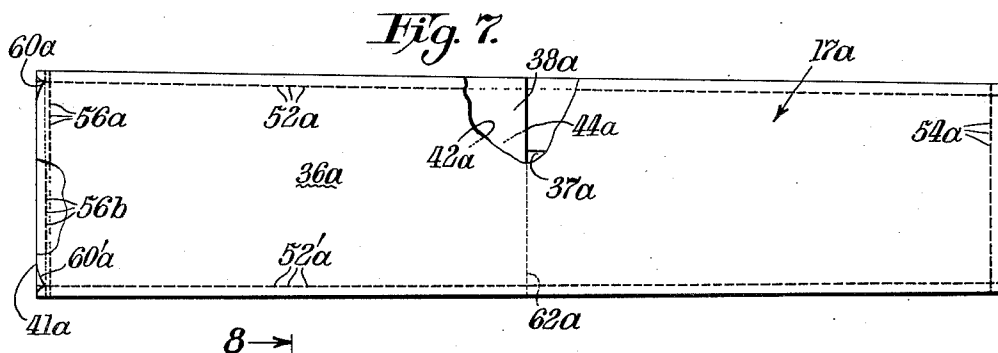
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2 SHEETS—SHEET 2



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2,637,409

DISPOSABLE DUST BAG FOR VACUUM CLEANERS

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Application October 26, 1950, Serial No. 192,314

5 Claims. (Cl. 183—51)

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This invention relates to vacuum cleaner dust bags and more particularly to inner disposable dust bags that are ordinarily enclosed in outer appearance bags, and one of the primary objects of the invention is to provide an improved article of this character.

Another object of the invention is to provide an inner disposable vacuum cleaner bag of a minimum cost of manufacture.

A further object of the invention is to provide an inner disposable vacuum cleaner bag that will not only be inexpensive to manufacture, but which will also be highly effective in filtering dirt and dust from the air stream of a vacuum cleaner.

Another object of the invention is to provide an improved disposable dust bag for vacuum cleaners of which the parts are secured together by straight lines of stitches.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations, and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings:

Fig. 1 is a top plan view of a vacuum cleaner bag having an outer appearance bag, of which portions are broken away to show parts of an inner disposable bag embodying the invention.

Fig. 2 is a sectional view, taken substantially on the line 2—2 of Fig. 1, and showing the bag in an inflated condition.

Fig. 3 is a plan view showing the uninflated disposable bag, partly cut away, before installation in the outer appearance bag.

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

Fig. 5 is an enlarged sectional view on the line 5—5 of Fig. 3.

Fig. 6 is an enlarged sectional view on the line 6—6 of Fig. 3.

Figs. 7 and 8 are views similar to Figs. 3 and 5, respectively, but showing another form of the invention, and

Fig. 9 is an enlarged view showing how a portion of the bag of Figs. 7 and 8 is held during a portion of the sewing operation.

Referring more specifically to the drawings, the vacuum cleaner bag of the present invention is illustrated as comprising a more or less conventional outer appearance bag 16 and an inner

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disposable bag 17, the inlet or lower 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 arrangement, indicated generally by the numeral 18. Since vacuum cleaner bags are normally supported in an inclined position with their inlet ends below their closed ends, the inlet ends of the bags and the inlet end of the various other parts will be termed the lower end, and the end remote from the inlet will be termed the upper end.

The outer appearance bag 16, preferably, is made from a single piece of loosely woven pervious material, and the longitudinal edges of the pervious material are joined by a slide-fastener 19. The upper or closed end of the outer bag 16 is engaged by a conventional clamp 21 that is connectible to a vacuum cleaner handle (not shown) by a bail 22.

The connector-sleeve and clamp 18 forms the subject of a patent application, Serial No. 186,968, filed September 27, 1950, and thus need not herein be described in detail. Suffice it to say, that the inlet end of the outer appearance bag 16 is secured by a wire 23 to a vacuum cleaner bag connector 24 that may be a duplicate of the bag connector described and claimed in U. S. Patent No. 2,523,739.

The same wire 23 that secures the outer bag 16 to the connector 24, also secures the lower divergent or inlet end of a substantially frusto-conically shaped flexible plastic tube 26 to the connector 24. The convergent upper or outlet end of the tube 26 is secured to the lower flanged or inlet end of an oval-shaped, preferably aluminum tube 27 by a clamp band 28. An intermediate portion of the band 28 pivotally supports one end of an L-shaped lever or bracket 29. The free end of the L-shaped bracket 29 pivotally supports parts 31 and 32 of a two-part clamping band. The free ends of the band parts 31 and 32 are joined by a trunk-type latch 33.

The inner disposable bag 17, which forms the subject of the instant patent application, includes the following major elements; viz., a pervious wall-member 36, a pervious wall-member 37, a relatively stiff preferably impervious trap-member 38, an upper or closed end 39, and a lower end or open inlet-mouth 41. The trap 38, which has been shown as extending the complete width but only about one-half the length of the wall-members 36 and 37 (Fig. 2), defines, with a lower portion of wall-member 36, an entrance passageway 42. The upper ends of the two wall-

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members 36 and 37 define a dirt filtering cavity or pocket 43. The lower end of the wall-member 37 and the trap 38 define a dirt collecting pocket or cavity 44. In other words, the cardboard trap 38 divides the lower end of the bag into two compartments, namely 42 and 44.

Figs. 3 and 6 show the three principal members of the disposable bag 17, and indicate that the pervious wall-member 36 is a single piece of flat material extending the full length and the full width of the disposable bag 17. Figs. 3 and 6 also show that the pervious wall-member 37 is formed from a single piece of pervious material longitudinally infolded at 46—46' and outfolded at 47—47', to form accordion folds. The folds 46 and 47, 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. Fig. 3 also shows that the trap member 38 is coextensive with only the lower or inlet half of wall-member 36, the trap member 38 being located between the wall-members 36 and 37 and secured in place by the same straight lines of stitches 52—52' that hold the two members 36 and 37 together. The upper end 39 of the disposable bag is closed by a straight line of stitches 54 extending perpendicular to the lines of stitches 52 and 52'; and all the lines of stitches 52, 52' and 54 may be formed by a conventional flat-bed sewing machine. The open or inlet end 41 of the bag 17 preferably is stitched on a cylinder-bed sewing machine, thereby forming what will be termed, for the purpose of the present description, a "straight" line of stitches 56 that extends circumferentially around the open mouth 41 of the bag 17, it being understood that the line of stitches 56 forms two parallel straight lines of stitches when the bag is folded for shipment, and a circular line of stitches when the mouth 41 of the bag is opened for insertion of the aluminum tube 27. The stitching 56, which is perpendicular to the lines of stitches 52 and 52', not only prevents the ends of the bag from fraying, but also closes the lower end of the dirt collecting cavity 44. Fig. 5 shows a detail of the stitching 56 as it extends around a portion of the open bag mouth 41. The stitching 56, at a location indicated by the numeral 57, secures the trap 38 to the bottom panel 48, and at another location, indicated by the numeral 58, secures together four layers, comprising, the bottom panel 48, the leaf-panel 49, the leaf-panel 51 and the trap 38. The line of stitches 56, at another location, indicated by the numeral 59, simply acts as a binding as it passes through the single layer of the wall 36. Fig. 4 shows the inner and outer bags in an inflated condition. When so inflated, the folds 46, 46', 47 and 47' of the inner disposable bag 17, become ordinary ribs as shown.

In use, the inner disposable bag 17 is placed within the outer bag 16 and attached to the aluminum tube 27 in the following manner. Assuming that the connector 24 is attached to the exhaust outlet (not shown) of a vacuum cleaner, and assuming that the bail 22 is supported in an upright position by the handle (not shown) of a vacuum cleaner, the slide-fastener 19 is

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opened to expose the inner bag 17 and the trunk latch 33, which latter item is opened. This permits the two-part clamping bands 31—32 to swing backwardly and allows removal of the old bag. After the open mouth of the replacement bag 17 is slipped over the upper end of the aluminum tube 27, the edges of the bag mouth are folded as at 61—61' and the two-part clamping bands 31—32 are clamped around the folded mouth 41 and tube 27 by the trunk latch 33. Thereafter, the slide-fastener 19 is closed and the vacuum cleaner is ready for use.

Dust and dirt, exhausted from the vacuum cleaner, enters the plastic tube 26, passes through the aluminum tube 27 and into the passageway 42, from whence it passes into the dirt filtering cavity 43. The dirt and dust is retained in the disposable bag 17, while the filtered air passes through the pervious wall 36 and the panels 48, 49—49' and 51'—51'. Since the outer and inner bags are supported in a vertical position by the vacuum cleaner handle, the dirt and dust settles from the cavity 43 into the collecting pocket 44. This assures that the upper portions of the walls 36 and 37 will be kept relatively clear, thus maintaining their ability to act as filters.

During construction of the bag 17, the cardboard trap 38 is flat and fairly rigid. This keeps the bag in the desired form and facilitates handling the bag during the sewing operations. When the mouth 41 of the bag 17 is slipped over the aluminum tube 27, the trap 38 bends widthwise thus providing a rigid channel or passageway 42 which "dresses" the lower end of the bag. Since the trap member 38 extends only one-half the length of the bag, the upper end 62 of the trap 38 provides a convenient place on which to fold the pervious members 36 and 37. When the disposable bag 17 is folded on the line 62, it is easily packaged and shipped.

When the disposable bag 17 is placed in the outer bag 16 in the usual manner, the wall 36 forms the upper side, and the wall 37 forms the lower side of the bag and, when the thus positioned bag is used, dirt falls by gravity into the pocket 44. However, it will be understood that the disposable bag 17 may be placed in the outer bag 16 with the wall 37 uppermost, and the wall 36 lowermost. Under these conditions the dirt is blown into the pocket 44 by moving air currents within the bag.

Figs. 7, 8 and 9 disclose an inner disposable bag 17a that is similar to the bag 17 shown in Figs. 1 through 6. The numerals used to designate parts of the bag 17a in Figs. 7, 8 and 9 are the same as those used on similar parts in Figs. 1 through 6, except that subscripts "a" and "b" have been added to the numerals of Figs. 7, 8 and 9. The bag 17a differs from the bag 17 in that the mouth 41a of the bag 17a is stitched, preferably by a flat bed sewing machine, with two separate straight lines of stitches 56a and 56b that are perpendicular to lines of stitches 52a and 52'a, instead of being stitched with a circumferential line of stitches 56 by a cylinder bed machine. The stitching 56a only passes through the single layer pervious wall member 36a and thus simply acts to prevent the end of the wall 36a from fraying. The stitching 56b passes through the cardboard trap member 38a, through the bottom panel 48a, as well as through the leaf-panels 49a and 51a. Thus the stitching 56b, not only prevents the ends of the panels 48a, 49a, 51a etc. from fraying, but also closes the lower end of the dirt collecting cavity 44a. Fig. 8 shows a

detail of the stitchings 56a and 56b. As indicated above, the stitching 56a simply passes through the pervious wall 36a. The stitching 56b, at a location indicated by the numeral 57b secures the trap 38a to the bottom panel 48a, and at another location, indicated by the numeral 58b, secures together four layers comprising, the bottom panel 48a, the panel 49a, the panel 51a and the trap 38a. At locations 60a and 60'a (Figs. 7 and 9), where the side edges of the wall-member 36a are folded back, the stitching 56b secures the wall 36a to the trap 38a, to the panel 48a and to the inwardly and outwardly hinged leaf-panels designated in Fig. 8 as 49a and 51a.

In sewing the disposable bag shown in Figs. 7, 8 and 9, the line of stitches 56a preferably will be formed first. Thereafter, the two longitudinally extending lines of stitches 52a and 52'a will be formed. Then, either the line of stitches 54a or the line of stitches 56b may be formed, depending on the convenience of the sewing machine operator. In applying the line of stitches 56b (Fig. 9), it will be necessary for the operator to lift the intake end of the wall member 36a, this in order to expose the upper surface of the cardboard trap 38a. The disposable bag 17a, in its uninflated condition, lies flat, all the members 36a, 38a, 48a, 49a, 51a etc. being parallel to a common plane.

The disposable bag 17a is used in exactly the same manner as that previously set forth in connection with the description of the bag 17.

In the bags shown, the traps 38 and 38a have been indicated as made of relatively stiff impervious material. By sacrificing some of the advantages hereinbefore discussed, the trap members 38 and 38a may, for certain applications, be formed from pervious and/or non-rigid material.

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

1. A disposable dust bag for vacuum cleaners, comprising, a first pervious member, a second pervious member, said second pervious member being infolded and outfolded on two sides thereby forming a member that is coextensive with said first pervious member, an impervious trap member coextensive with substantially one-half the length of said first member, means securing portions of said pervious members together and at the same time securing said trap member between said pervious members, and additional means securing said trap member to one of said pervious members.

2. A disposable dust bag for vacuum cleaners, comprising, a flat rectangular pervious member; a second rectangular pervious member, said second member being infolded and outfolded on two sides thereby forming a member having a pair of inwardly hinged leaf-panels and a pair of outwardly hinged leaf-panels; an impervious flat

rectangular trap member located between said pervious members and coextensive with substantially one-half of said flat pervious members; stitching means securing said first pervious member and said trap member to said outwardly hinged leaf-panels; and stitching means securing said trap member to said second pervious member.

3. A disposable dust bag for vacuum cleaners, comprising, a flat rectangular pervious member; a second rectangular pervious member, said second member being infolded and outfolded on two sides thereby forming a member having a pair of inwardly hinged leaf-panels and a pair of outwardly hinged leaf-panels; an impervious flat rectangular trap member located between said pervious members and coextensive with substantially one-half of said flat pervious members; a pair of spaced parallel means securing opposite sides of said first pervious member and opposite sides of said trap to said pair of outwardly hinged leaf-panels; means securing one end of said flat impervious member to one end of said second member; and a mouth on one end of said bag formed by said means securing one end of said impervious member to one end of said second member.

4. The construction recited by claim 3 characterized in that the various means securing the bag members together are straight lines of stitches.

5. A disposable dust bag for vacuum cleaners, comprising a first pervious wall-member formed as a single piece of material, a second pervious wall-member formed as a single piece of material infolded and outfolded on two sides thereby forming a pair of inwardly hinged leaf-panels and a pair of outwardly hinged leaf-panels coextensive with said first wall-member, a trap member located between said wall-members, said trap member being the same width as said first and second wall-members and coextensive lengthwise with less than the full extent of said wall-members, means securing said first wall-member to outer edges of said outwardly hinged leaf-panels of said second wall-member and securing said trap member between said wall-members, and means securing a portion of said trap member to one of said wall-members.

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