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3,201,027

DOUBLE GUSSET BAG

Filed April 26, 1963

FIG. 1.

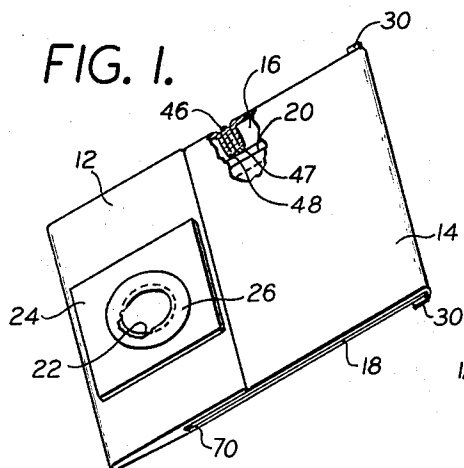


FIG. 2.

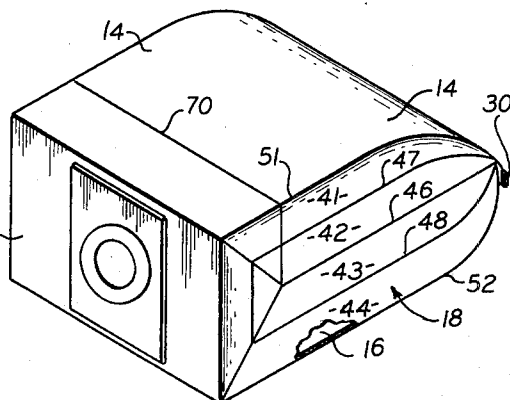


FIG. 3.

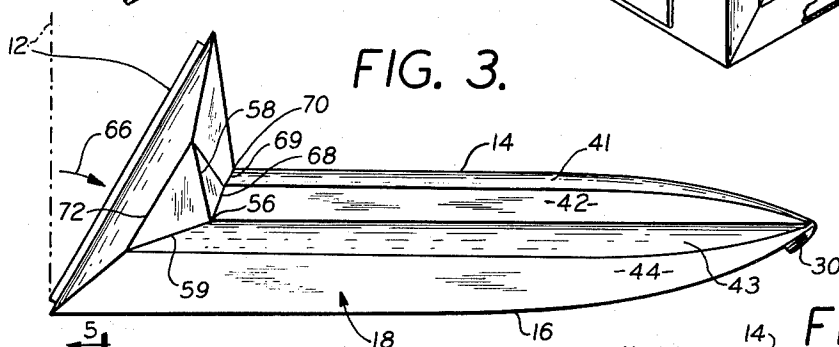


FIG. 4.

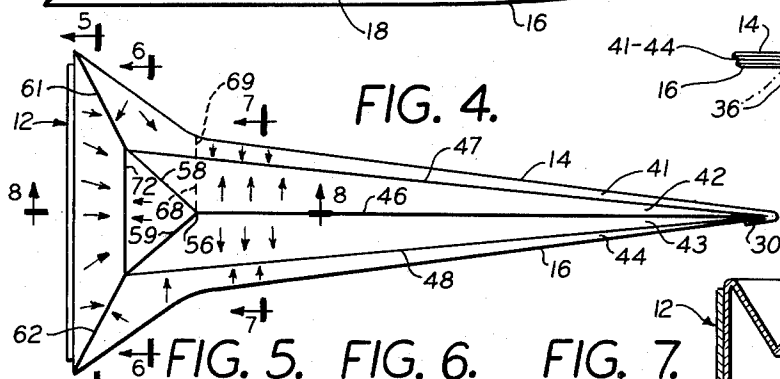


FIG. 9.

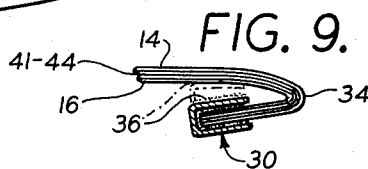


FIG. 8.

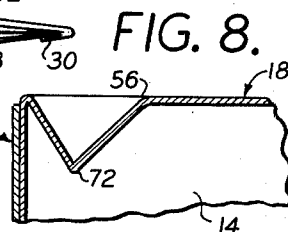


FIG. 5.

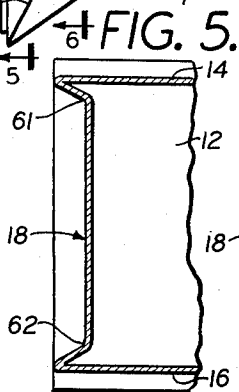


FIG. 6.

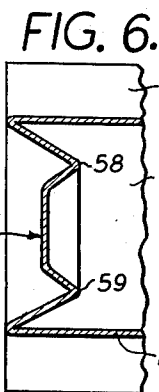
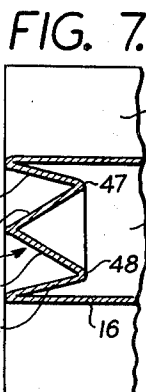


FIG. 7.



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DOUBLE GUSSET BAG

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10 Claims. (Cl. 229—53)

This invention relates to bags and more especially to paper bags which are intended for use with vacuum cleaners as dust bags.

One type of paper bag that is commonly used in vacuum cleaners has a flat bottom and has its upper end closed by bringing the front and back walls of the bag adjacent to one another with the side walls folded between them. When such a bag is used in a vacuum cleaner, its cross section decreases toward the closed end and it is an object of this invention to provide such a bag with side walls folded in such a way that the full cross section of the bag is maintained for a greater portion of the bag length, enabling it to hold more dirt, as compared with comparable bags of the prior art. This object is attained by having each side wall of the bag constructed with at least four panels which join one another along fold lines and which join the front and back walls of the bag along other fold lines.

Another object of the invention is to provide a bag construction having a bottom from which front, rear and side walls extend upwardly and with the side walls folded to form more than two panels for each side wall so that the panels do not extend so far inward between the front and rear walls as in the case of conventional self-opening bags. Another object is to provide such a bag with diverging fold lines where the side panels approach the bottom and with transverse folds so that the front, back and side walls can fold flat against one another and the bottom can also fold flat against the other part of the bag.

Another object of the invention is to provide an improved vacuum cleaner bag which is made of air-pervious paper and which is of economical construction with a broad, flat bottom and front, rear and side walls which come together at a closed upper end of the bag. The side walls are made with multiple folds which permit the bag to be expanded by air pressure to a cross section substantially equal to the area of the bottom throughout a large percentage of the total length of the bag.

Other objects, features and advantages of the invention will appear or be pointed out as the description proceeds.

In the drawing, forming a part hereof, in which like reference characters indicate corresponding parts in all the views:

FIGURE 7 is an isometric view showing a bag made in accordance with this invention and with the bag in its flat, folded condition;

FIGURE 2 is a view similar to FIGURE 1 but showing the bag expanded as when subjected to the air blast from a vacuum cleaner;

FIGURE 3 is a side elevation showing the bag in a partially-folded condition in order to illustrate the positions and correlations of the various fold lines;

FIGURE 4 is a diagrammatic view of the bag in a partially-folded condition and illustrating the directions of the different folds by means of arrows which point in the direction in which the illustrated surfaces slope away from the observer;

FIGURES 5, 6 and 7 are transverse sectional views taken on the section lines 5—5, 6—6 and 7—7, respectively, of FIGURE 4;

FIGURE 8 is a longitudinal, sectional view taken on the line 8—8 of FIGURE 4; and

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FIGURE 9 is a diagrammatic view showing the closed upper end of the bag.

The bag includes a bottom 12, a front wall 14, a rear wall 16, and two side walls 18 which extend from the front wall 14 to the back wall 16. In the preferred construction the bottom 12 and all of the walls of the bag are made of a single sheet of paper which is originally a part of a continuous web that is folded and secured along its opposite edges to form a flat tube having a seam 20, in accordance with conventional bag manufacture.

There is an opening 22 through the bottom 12 and the bottom 12 is reinforced around the opening 22 by a stiff panel 24 attached to the bottom 12. The opening 22, and the panel 24, when a panel is used, can be at other locations, in accordance with the design of the vacuum cleaner in which the bag is intended to be used. The dust-laden air inlet fitting of the vacuum cleaner extends through the opening 22 and there is a sealing ring 26 located around the circumference of the opening 22 for preventing leakage of air between the edges of the opening 22 and the air inlet fitting of the vacuum cleaner.

The bag is originally supplied in a flat, folded condition, as shown in FIGURE 1, with all of the walls of the bag folded flat against one another and with the bottom 12 also folded flat across the front 14.

FIGURE 2 shows the bag in its expanded, or blown-up condition. The front wall 14 is substantially parallel to the rear wall 16 for most of the length of the bag. However, the front and rear walls 14 and 16, respectively, are joined together at the upper end of the bag by a closing strip 30. This produces a reduction in the cross section of the bag toward the closed upper end of the bag. The side walls 18 are folded in flat between the front and rear walls 14 and 16, respectively, at the closed end, and the closing strip 30 is folded over the outside surfaces of the front and rear walls, as shown in FIGURE 9. In order to avoid the necessity of adhesive on any parts except the strip 30, at the closed end of the bag, this strip 30 is preferably extended for a short distance beyond the side limits of the walls 14 and 16, as shown in FIGURES 1 and 2. Where the strip 30 is so extended, the confronting inside faces of the strip 30 adhere to one another and thus provide tight seals against air leakage at both ends of the folded strip 30.

The closed end of the bag is preferably folded along a transverse fold 34 (FIGURE 9) and adhesive 36 on the outside of the strip 30, where the strip confronts the rear wall 16, is used to secure the strip 30 to the rear wall 16. FIGURE 9 shows this adhesive 36 spaced from the back wall 16 for cleaner illustration.

Each of the side walls 18 is made with at least four panels. These panels are designated by the reference characters 41, 42, 43 and 44. The mid panels 42 and 43 join one another along a fold 46. The other side of the panel 42 joins the panel 41 along a fold 47; and the panel 43 joins the panel 44 along a fold 48. The panel 44 joins the front wall 14 along a fold 51, and the panel 44 joins the rear wall 16 along a fold 52. When the bag is in its expanded condition, as shown in FIGURE 2, all of the side panels 41—44 are in substantially the same plane, but when the bag is partly folded, the fold 46 extends outward and the folds 47 and 48 extend inward, as indicated by the arrow-heads in FIGURE 4. These arrows point in the direction in which the panel surfaces slope away from a person observing the drawing.

It will be apparent that the outward slope of the panels to the fold 46, and their inward slope to the folds 47 and 48, permit the panels to fold flat against one another at the closed upper end of the bag. A special correlation of other folds is necessary, however, at the bottom portion

of the bag in order to permit the bottom wall 12 to fold flat against the bag.

This special construction of each of the side walls 14, adjacent to the bottom of the bag, is best shown in FIGURES 3 and 4. At a point 56, the center fold 46 joins two diverging folds 58 and 59, which extend outwardly to the ends of the folds 47 and 48, respectively. These diverging folds 58 and 59 fold outwardly, as will be evident from the arrowheads in FIGURE 4.

At the diverged ends of the folds 58 and 59 there are other folds 61 and 62, respectively, which diverge outwardly as they approach the bottom 12 of the bag. These folds 61 and 62 terminate adjacent to the corners of the bottom 12 and they fold inwardly, as is evident from the arrowheads in FIGURE 4. There are other folds which make it possible to swing the bottom 12 angularly with respect to the bottom wall 18, as shown in FIGURE 3 and as indicated by the arrow 66. These additional folds include a fold 68 extending transversely across the panel 42, another fold 69 extending from the fold 68 and transversely across the panel 41. There is another transverse fold line 70 extending transversely across the front wall 14.

The panels 41 and 42 do not have the folds 68 and 69 when the bottom 12 is at right angles to the length of the bag, as shown in FIGURE 4, but the lines along which the folds 68 and 69 form, are indicated in dotted lines in FIGURE 4 and designated by the same reference characters as the folds themselves.

Another transverse fold line 72 extends from the points at which the diverging folds 58 and 59 meet the other folds 61 and 62, respectively. Since the fold 46 terminates at the point 56, and the folds 47 and 48 terminate at the transverse fold 72, there is a substantial flat expanse of the side wall 18 between the folds 61 and 62, as is illustrated in FIGURE 5. A section through the side wall 18, on the upper side of the fold line 72, is shown in FIGURE 6; and a section still further up the side wall 18 is shown in FIGURE 7.

FIGURE 8 is a longitudinal section on the line 3-3 of FIGURE 4, as previously explained, and this sectional view shows the way in which the side wall 18 slopes inwardly from the point 56 and then outwardly again at the transverse fold 72 to meet the side edge of the bottom 12.

The side wall construction illustrated and described increases the capacity of the bag because the plural panels 41-44 of the side walls make the maximum inward extent of the folded side wall only one half as much as if the side wall were made with only two panels, as in a conventional self-opening bag. Because of the fact that the inwardly-extending folds of the side walls extend for a shorter distance into the interior of the bag, the closed upper end of the bag expands to the full cross section of the bottom of the bag in a much shorter portion of the bag length than would be the case if there were only two panels in each of the side walls 18. This not only increases the capacity of the bag, but is also increases the area of the bag through which air escapes when the bag is used in a vacuum cleaner. The increased area reduces back pressure in the vacuum cleaner when using paper of any particular degree of porosity.

The preferred embodiment of the invention has been illustrated and described, but changes and modifications can be made and some features can be used in different combinations without departing from the invention as defined in the claims.

What is claimed is:

1. A bag having a bottom, front and rear walls extending upward from the bottom, side walls also extending upward from the bottom and each of which extends between the front and rear walls of the bag, each of the side walls comprising at least four panels extending lengthwise of the bag for most of the length thereof, two of the said four panels being joined with the front and rear

walls, respectively, along folds, the panels that are joined with the front and rear walls being joined on other sides to intermediate panels along other folds, and the bag having a middle fold at which intermediate panels are joined together, the middle fold dividing into two folds near the bottom of the bag and that diverge as they extend toward said bottom, and said diverging folds connecting with other folds that diverge and that extend to the bottom of the bag and that fold in opposite directions to said first diverging folds.

2. The bag described in claim 1 characterized by means closing the upper end of the bag that is remote from the bottom, the front and rear walls being brought together at the closed upper end, and the panels of each of the side walls being folded into flat relationship with one another and with the front and rear walls at the closed upper end of the bag.

3. The bag described in claim 2 characterized by the bottom of the bag being flat and formed by extensions of the front, rear and side walls folded in upon one another and secured together by adhesive.

4. The bag described in claim 3 characterized by the bag being made of air-pervious paper and having an opening at the bottom portion of the bag for receiving an air discharge fitting of a vacuum cleaner.

5. The bag described in claim 4 characterized by the opening being in the bottom of the bag, and sealing means around the periphery of the opening for preventing leakage of air from the bag around the air discharge fitting that extends into the bag.

6. A bag having a bottom, front and rear walls extending upward from the bottom, side walls also extending upward from the bottom and each of which extends between the front and rear walls of the bag, each of the side walls comprising at least four panels extending lengthwise of the bag for most of the length thereof, and joining with adjacent panels along fold lines, two of said four panels joining with the front and rear walls, respectively, along other fold lines, a middle fold at the juncture of two others of said four panels dividing into two diverging folds near the bottom of the bag, and said diverging folds connecting with other folds that diverge and that extend to the bottom of the bag and that fold in opposite directions to said diverging folds, the bag being characterized by the diverging folds extending from the middle fold that connects two mid panels with one another and outwardly to other folds that connect the other sides of said mid panels with the next adjacent panels of each side wall, a transversely-extending fold between the ends of the diverging folds at their juncture with the other folds, inwardly-extending folds from said junctures to corners of the bottom of the bag, and means closing the upper end of the bag, said means holding all of the panels of the bag in adjacent relation to one another at said upper end.

7. The bag described in claim 6 characterized by other transverse folds extending from the location where the diverging folds begin to diverge and extending across the side panels from the center fold of each side of the bag to one wall of said front and rear walls and along which the bag folds flat with the bottom of the bag parallel to the front and rear walls and to all of the panels of the sides of the bag when the bag is in a flat, folded condition.

8. The bag described in claim 2 characterized by the means closing the upper end being a strip folded over the upper portions of the outside surfaces of the front and back walls of the bag and secured to said surfaces by adhesive.

9. The bag described in claim 3 characterized by the folded strip having a length greater than the width of the front and back walls of the bag so that portions of the ends of the strip extend somewhat beyond the limits of the bag, the confronting surfaces of the extending ends of the strip being secured to one another by adhesive.

10. The bag described in claim 2 characterized by the means closing the upper end of the bag being a strip folded over the end of the bag and having adhesive securing its confronting faces to the portions of the bag walls which it extends across, the upper end of the bag inward 5 from the folded strip being folded back on itself to bring one outside surface of the strip into confronting relation with a wall of the bag, and adhesive securing the outside surface of the strip to the wall of the bag which the strip

confronts as a result of the folding back of the upper end of the bag.

References Cited by the Examiner**UNITED STATES PATENTS**

587,928	8/97	Chesney	-----	229—65
2,051,106	8/36	Rosen	-----	229—62
2,818,936	1/58	Cropley	-----	55—376

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