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C. V. BRADY

3,067,926

BAGS

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FIG. 1.

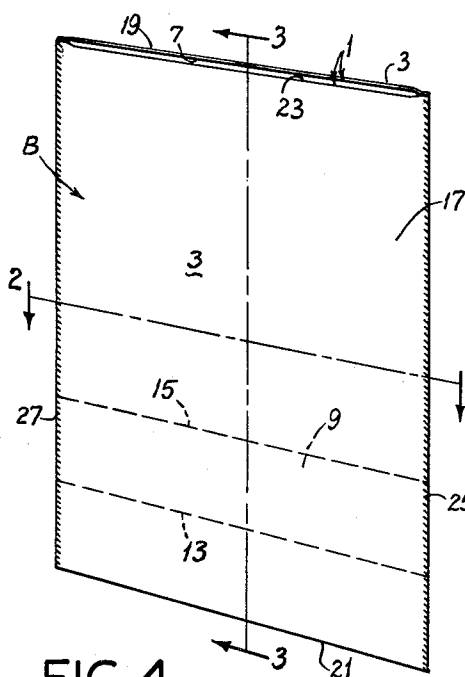


FIG. 2.

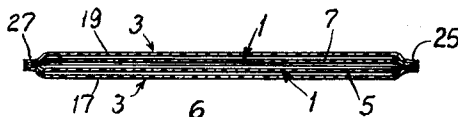


FIG. 5.

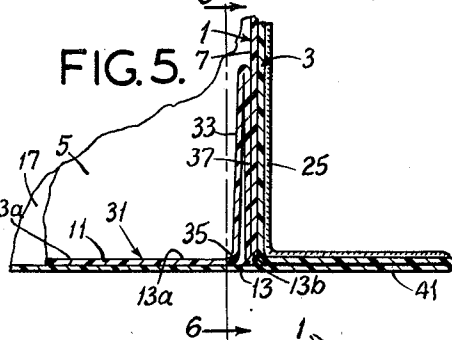


FIG. 3.

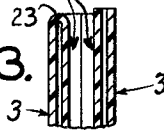


FIG. 4.

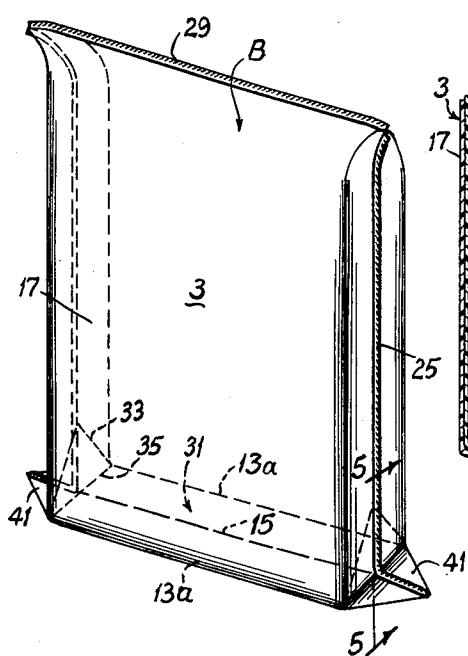
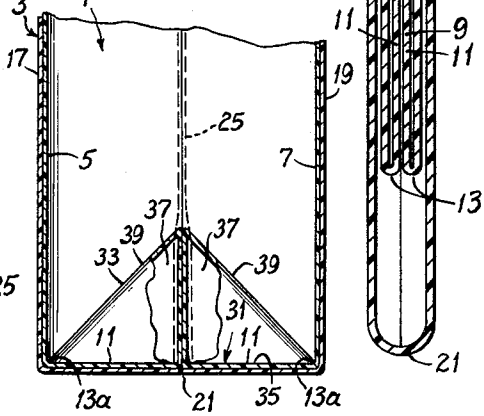


FIG. 6.



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BAGS

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This invention relates to bags, and more particularly to plural-ply heat-sealed plastic bags for containing powdered or granulated materials.

The invention is especially concerned with plural-ply heat-sealed plastic bags of the type having heat-sealed seams at both sides used for packaging granulated sugar or the like. It is desirable that such bags, when filled, have a square bottom so that they may stand on a shelf for display purposes. While a square bottom formation may be attained by providing a bottom gusset, conventional bottom gusset formation of a plural-ply bag requires heat-sealing through such a number of layers of heat-sealable material at the bottom gusset to form the side seams as to make manufacture of such bags difficult. For example, in the case of a two-ply bag, conventional bottom gusset formation requires heat-sealing through eight layers of material at the bottom gusset to form the side seams.

Accordingly, among the several objects of this invention may be noted the provision of an improved bottom construction for plural-ply heat-sealed plastic bags such as described, which is adapted to provide a square bottom formation when the bag is filled, and which does not require heat-sealing through an undue number of layers of material to form the side seams; the provision of a bottom construction such as described which is stronger than a conventional gusset bottom; the provision of a bottom construction such as described which provides ears adapted to serve as handles for picking up the filled bag to avoid puncturing of the bag by sharp fingernails, the construction being such as to keep the contents of the bag out of the ears so that they remain flat and flexible; and the provision of a bottom construction such as described which may be economically manufactured. Other objects and features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the constructions hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings, in which one of various possible embodiments of the invention is illustrated,

FIG. 1 is a perspective of a bag of this invention as it appears in its flat condition before being filled and closed;

FIG. 2 is a horizontal cross section taken on line 2-2 of FIG. 1;

FIG. 3 is an enlarged vertical cross section taken on line 3-3 of FIG. 1 with an intermediate portion of the bag broken away to reduce the height of the view;

FIG. 4 is a perspective illustrating the shape assumed by the FIG. 1 bag when it is filled and closed;

FIG. 5 is an enlarged vertical cross section taken on line 5-5 of FIG. 4 with certain parts removed; and

FIG. 6 is a vertical cross section taken on line 6-6 of FIG. 5, with parts further broken away.

The thickness of the bag material is exaggerated in FIGS. 2, 3, 5 and 6. Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings, a bag B of this invention is shown to have an inner ply 1 and an outer ply 3 of heat-sealable sheet material, such as polyethylene. The inner ply 1, in effect, constitutes an inner bag having front and back walls 5 and 7, respectively, joined together at

the bottom by an intuck or gusset 9. The gusset 9 is constituted by portions of the inner ply 1 extending completely across the bag and is located between the lower portions of the front and back walls 5 and 7. It consists of a fold of the inner ply 1, each half or panel thereof being designated 11. Each gusset half is integrally joined to the respective wall 5 or 7 at a fold line 13 and the two halves are joined together along a central fold line 15 which is spaced upward from the fold lines 13.

The outer ply 3, in effect, constitutes an outer bag having front and back walls 17 and 19, respectively, extending below the inner front and back walls 5 and 7 a distance substantially equal to the heightwise dimension of gusset 9. Outer walls 17 and 19 are integrally joined together at their lower ends at a fold 21 which constitutes the bottom of the outer bag. As shown in FIG. 3, the upper end of front wall 17 of the outer ply 3 is integrally joined to the upper end of front wall 5 of the inner ply 1 at a fold line 23, the bag consisting of a single piece of heat-sealable material.

The bag has heat-sealed side seams 25 and 27 securing together the side margins of the front and back walls of both the inner and outer plies 1 and 3. The ends or side margins of gusset halves 11 of the gusset 9 are caught and sealed in the heat-sealed side seams 25 and 27. As will be apparent, only six layers of heat-sealable material are heat-sealed together at the side margins of the bag in the region of the gusset 9, as distinguished from a conventional bottom gusset formation for a two-ply bag, in which eight layers would have to be sealed in the region of the gusset. Four layers are heat-sealed together above the gusset, and two layers are heat-sealed together below the gusset. After the bag is filled, the inner and outer plies may be heat-sealed together along the tops thereof as shown at 29 to close the bag.

When the bag B is filled, it assumes a shape such as shown in FIGS. 4-6. The front and back walls of the bag spread apart, and this causes the gusset 9 to spread out generally flat (i.e., its halves 11 fold out on fold line 15 into generally horizontal coplanar relation). Since the ends of the gusset halves are heat-sealed in the side seams 25 and 27, the gusset spreads out flat in such manner as to provide a rectangular bottom 31 for the inner bag constituted by the inner ply 1. At each bottom corner of the filled bag, a triangular portion 33 of the gusset folds up on a fold line 35. These fold lines 35 constitute the ends of the rectangular inner bag bottom 31. The sides of the rectangular inner bag bottom 31 are defined by portions 13a of the original fold lines 13. Also, at each bottom corner of the filled bag there are two triangular portions 37, derived from gusset halves 11, located between triangular portion 33 and the side wall portion of inner ply 1. The bottom edge of each triangular portion 37 is defined by a portion 13b of a respective fold line 13, a second edge thereof is defined by an angled fold line 39 where it is integrally joined to portion 33, and the third edge thereof is the end of the respective gusset half caught in the respective heat-sealed side seam.

When the bag is filled, the bottom portion of the outer ply 3 also spreads out flat, but since it is ungusseted, bottom corner portions of the outer ply 3 assume the form of triangular ears 41 extending outward from the ends of the outer bag bottom. These ears 41 may be folded up against the sides of the bag and sealed in that position at the packing machine either before or after the bag is filled or they may be left in their generally horizontal protruding position, in which case they may be used as handles for picking up the filled bag and thus avoiding puncturing of the bag body by sharp fingernails. It will be noted that the construction is such as to keep the con-

3

tents of the bag out of the ears 37, so that they remain free and flexible.

The inner ply 3, being relatively sharply folded on gusset fold lines 13 and 15, may be thereby weakened along these lines. With the outer ply 3 extending below folds 13 a distance substantially equal to the height of the gusset 9, when the gusset 9 spreads open and flattens out, it nests against the outer bottom formation of the outer ply 3. Accordingly, the outer ply provides reinforcement for the inner ply along lines 13 and 15, where the inner ply may be per se weakened.

While the bag is shown in the drawings to be constructed out of one sheet of heat-sealable material with the inner ply and the outer ply joined at a fold line 23, it will be understood that the bag could be formed of individual sheets constituting inner and outer plies which could be heat-sealed together in the vicinity of fold line 23.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A bag having an inner ply and an outer ply, the inner ply having front and back walls, a gusset joining said walls together at the bottom of the inner ply constituted by portions of the inner ply extending completely across the bag and located between the lower portions of the

4

front and back walls of the inner ply, the outer ply having front and back walls extending below the front and back walls of the inner ply and joined together at their lower ends, the width of the front and back walls of the inner ply being equal to the width of the front and back walls of the outer ply, the bag having a single seam at one side securing together the respective side margins of the front and back walls of the inner and outer plies, and a single seam at the other side securing together the respective side margins of the front and back walls of the inner and outer plies, the ends of said gusset-forming portions of the inner ply being caught in said side seams.

2. A bag as set forth in claim 1 made of heat-sealable plastic, the side seams being heat-sealed seams.

3. A bag as set forth in claim 1 wherein the front and back walls of the outer ply extend below the front and back walls of the inner ply a distance substantially equal to the heightwise dimension of the gusset.

4. A bag as set forth in claim 3 wherein the front and back walls of the outer ply are joined together at their lower ends by an integral fold.

5. A bag as set forth in claim 4 made of heat-sealable plastic, the side seams being heat-sealed seams.

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