June 9, 1964 W. J. GEIMER 3,136,475

BAG BOTTOM CLOSURE HAVING A V-SHAPED BOTTOM

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FIG. 1

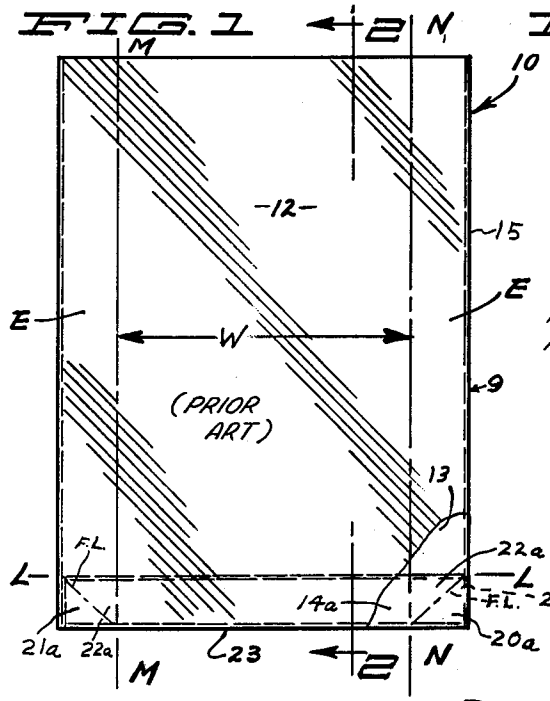


FIG. 2

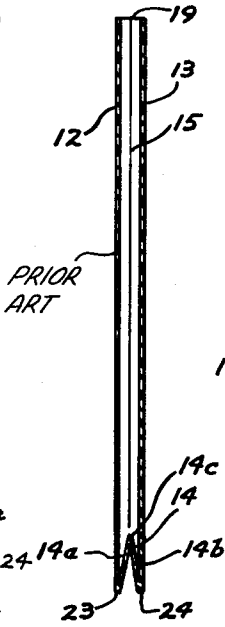
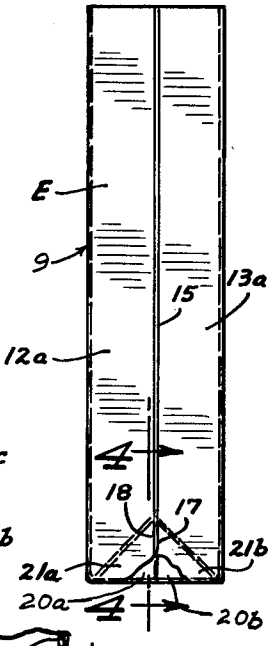


FIG. 5



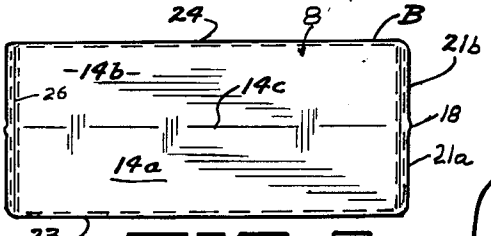


FIG. 8

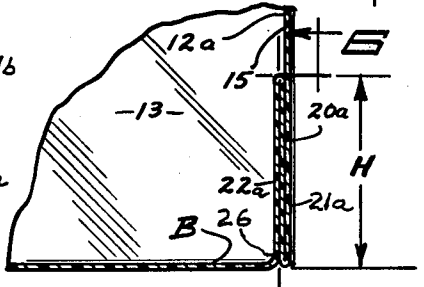
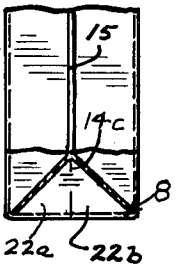


FIG. 4

FIG. 6



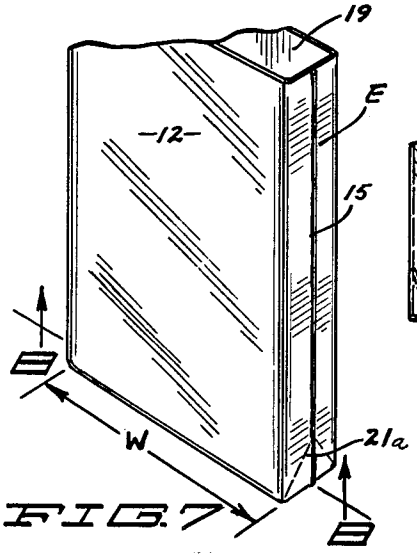


FIG. 7

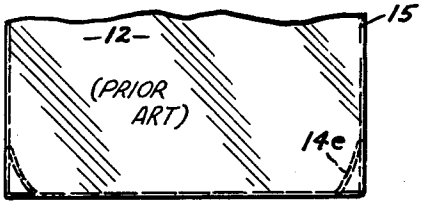


FIG. 3

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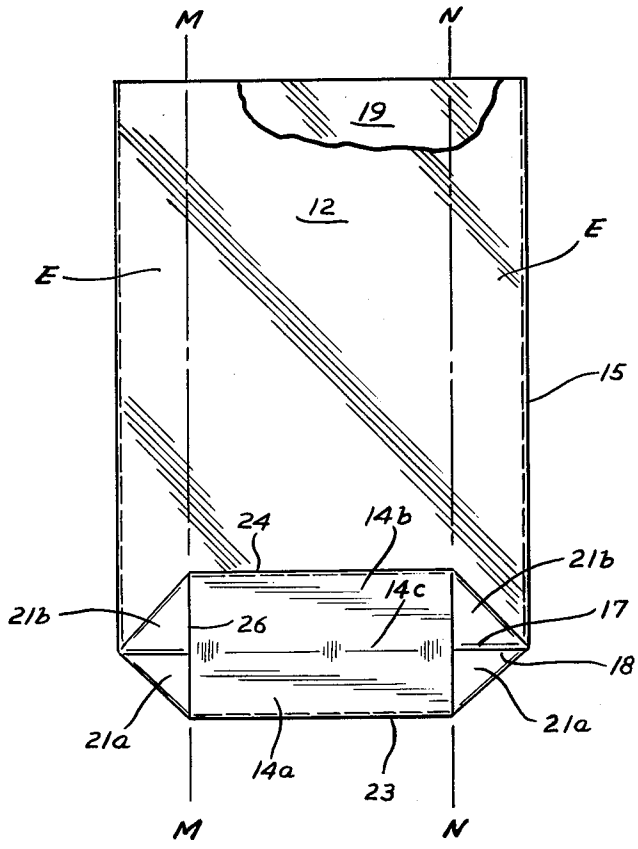
FIG. 9



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3,136,475
BAG BOTTOM CLOSURE HAVING A V-SHAPED BOTTOM

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4 Claims. (Cl. 229—57)

This invention relates to new and novel improvements in plastic bag bottom construction. More particularly this invention relates to providing a polyethylene bag having a V-shaped bottom with a strengthened bag bottom as well as sealing the corner portions of the bag to keep fine particles from settling therein whereupon the corners of the filled bag will be square and even and the bag bottom will retain a generally planar shape even after the bag has been filled and handled.

Polyethylene bags with V-shaped bottoms of the prior art are very much in use today for packaging shirts, sweaters and other light weight items. However, such bags do not readily lend themselves to being used for powdered or granular products such as sugar, since the prior art construction of the bag bottom does not lend sufficient support for heavier products and the plastic bags of the prior art do not assume and maintain square bottoms when such bags are filled. Further, the plastic bags of the prior art, upon being filled, tend to assume a pillow shape, namely, a rounded bottom. As a result, it is not convenient to stack the filled bags of the aforementioned nature on the shelf for consumer's use in a neat appearing manner. Also, due to the pillow shape, the bags which are filled with a granular product are easily broken upon being handled and are not attractive in appearance.

An object of this invention is to provide a new and improved bag bottom closure for a flexible plastic bag having a V-shaped bottom. A further object of this invention is to provide for a plastic bag having a V-shaped bottom a new and improved bag bottom closure that provides additional strength at the bottom corners as well as preventing fine granular or powdered products from settling in the corner portions.

A still further object of this invention is to provide for a plastic bag having a V-shaped bottom, a bottom closure, which upon filling the bag, will have square corners to give it added sales appeal and will provide a bag that is more conveniently stacked on shelves for customer's use. An additional object of this invention is to provide a type of bag bottom construction for small plastic bags that is economical to produce, dependable in closure and which has added sales appeal over the bag bottom construction of the prior art.

Other and further objects of this invention are those inherent in the invention herein illustrated, described in the claims, and will be apparent as the description proceeds.

To the accomplishment of the aforegoing and related ends, the invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed. The invention is illustrated with reference to the drawings in which corresponding numerals refer to the same parts and in which:

FIGURE 1 is a front vertical view of an empty plastic bag having a V-shaped bottom, the bottom closure being of conventional construction;

FIGURE 2 is a vertical cross-sectional view of the bag

of FIGURE 1 taken along the line looking in the direction of the arrows 2—2 of FIGURE 1;

FIGURE 3 is a fragmentary lower front view of the bag of FIGURE 1 shown in a condition that it assumes upon being filled with a heavy type product, the curvature of the V-shaped bottom closure adjacent the edge walls being slightly exaggerated to more clearly illustrate the slight distortion of the bag bottom closure;

FIGURE 4 is a fragmentary cross-sectional view of a filled bag of the type illustrated in FIGURE 1 except that it is provided with the bottom closure of this invention, said view being taken along the line and in the direction of the arrows 4—4 of FIGURE 5;

FIGURE 5 is an end view of a filled bag having the bag bottom closure of this invention, a portion of the adjacent edge wall being broken away to more clearly illustrate the invention;

FIGURE 6 is an enlarged vertical cross-sectional view taken along the line and in the direction of the arrows 6—6 of FIGURE 4 to illustrate the bag bottom closure of this invention, said view more clearly showing a lower portion of the edge wall;

FIGURE 7 is a perspective view of a filled bag having the bag bottom closure of this invention;

FIGURE 8 is a bottom view of the bag illustrated in FIGURE 7; and

FIGURE 9 is a front vertical view of an empty bag of this invention.

The type of container herein disclosed and as illustrated in FIGURE 1 that is to be provided with the bag bottom closure of this invention comprises a flat flexible tubular body **9** formed from a single web of sheet material folded upon itself to provide front and rear walls **12** and **13** respectively joined together at their bottom end by the V-shaped fold **14**. The fold **14** has panels **14***a* and **14***b* joined at the crease line **14***c*. The contiguous upright edges of the front rear walls are suitably joined together the length thereof to complete the formation of a bag having a tubular bag body open at one end and closed at the opposite end. The bag may be made of a plurality of sheets of plastic material, however, it is preferred to form the bag as described herein.

In the present invention, the container shown is made from a single sheet of transparent plastic material, such as transparent polyethylene, whereby the upright contiguous edges of the front and rear walls are "welded" together at **15** by the application of heat and pressure thereto to form seams. The welds **15** extend from the crease line **14***c* of the V-fold **14** to the bag mouth **19**. The lateral edges **24** of the panel **14***a* of the V-fold are welded at **18** to the portion **12***a* of the front wall which forms one-half of an edge wall E when the bag is filled, welds **18** being coextensive with welds **15**. The other panel **14***b* of the V-fold has its lateral edges welded at **17** to the adjacent edge portions **13***a* of the rear wall which form the other half of the edge wall E when the bag has been filled with product, welds **17** being coextensive with welds **18**. As a result of the panels being welded in the aforementioned manner the lateral edges of each panel will also be welded together to form a continuation of the weld **15**.

By forming a bag in the aforementioned manner, the bag when filled will have a rectangular bag bottom B made up of the portions of panels **14***a*, **14***b*, said bottom having transverse edges **23**, **24** and lateral edges **26**. The outer transverse edge **24** of panel **14***b* is joined to the bottom edge of the back wall along a length W while the outer transverse edge **23** of panel **14***a* is joined to the front wall along the same length.

The portions of the front and rear walls to the left of line M—M of FIGURE 1 form one edge wall E, while

the portions of said front and rear walls to the right of line N—N form the opposite edge wall E. The triangular corner portions of the front and rear walls of FIGURE 1 below the line F.L. and herein designated **21***a* and **21***b* for the front and rear walls respectively are a continuous integral portion of the respective portions **12***a* and **12***b*. The triangular portions **20***a* and **20***b* of FIGURE 1 of the respective panels **14***a* and **14***b*, which are located below the same line F.L., each have a bottom edge integrally joined to the bottom edge of the adjacent triangular portions **21***a*, **21***b* and a side edge welded at the continuation of weld **15** to a side edge of the adjacent triangular corner portion **21***a*, **21***b*. The third edge of the aforementioned panel triangular portions are formed integral with a corresponding edge of the respective triangular portion **22***a*, **22***b* of the same panel which, when the bag is folded as shown in FIGURE 1, are bound either by lines L—L, M—M and F.L. or lines L—L, N—N and F.L. A second edge of the triangular portions **22***a*, **22***b* are formed integral with the adjacent lateral edges of portions of the panels **14***a*, **14***b* which form the rectangular bag bottom B, while the third edges are integrally joined at the crease line **14***c*. Upon opening the bag, each of the adjacent sets of triangular portions **20***a*, **21***a*, **22***a* and **20***b*, **21***b*, **22***b* (all of which are of the same size and shape) are folded whereby portions **20***a* are located intermediate portions **21***a* and **22***a* and generally parallel thereto and likewise portions **20***b* are located intermediate portions **21***b* and **22***b* and generally parallel to the last mentioned portions.

When the bag as described heretofore is filled with product the triangular portions **22***a*, **22***b* become curved as illustrated in a slightly exaggerated scale in FIGURE 3, and designated **14***e* in the same figure.

This slight distortion of the bag bottom weakens the area at the bottom portion. A granular product filled in the bag shown in FIGURES 1–3 form almost a square corner at the bottom, however, the lower edge end portions outwardly from portions **14***e* will not lend support of any value which is in part due to the aforementioned distortion and product works into the corner portions such as between **20***a* and **22***a* to round out the corners.

I have found that the aforementioned problems can be overcome by welding the end portion **14***e* of FIGURE 3 to the adjacent triangular portions. That is, each adjacent set of triangular portions **20***a*, **21***a* and **22***a* and **20***b*, **21***b* and **22***b* are welded together throughout their contiguous vertical surfaces (assuming the bag is in an open upright condition as illustrated in FIGURE 7). This can be accomplished by inserting a probe or arm or other means (not shown) into the bag to back the portion **14***e*. Thence contact from the outside of the bag is made at the area of portions **21***a*, **21***b* to weld the triangular portions together as above mentioned. This process can be applied at the time the bags are manufactured, or at a filling station just prior to or during the filling operation. The results of the aforementioned process are shown in FIGURES 4–8 wherein strength is provided at the bottom corners where stresses or strains are likely to occur due to filling, shipping and handling. After the bottom closure **8** of the construction above described which includes the rectangular bottom B and welded together triangular portions **20***a*, **20***b*, **22***a* and **22***b*, has been provided and the bag has been filled with product, the bag may be closed with any appropriate type of bag top closure.

By using the bag bottom closure **8** of this invention, conventional polyethylene bags with V-shaped bottoms such as normally only used for packaging shirts, sweaters and other light-weight items may be adapted for use for powdered or granular products such as sugar, since the bag bottom closure of this invention readily lends itself to sufficiently supporting heavier products. Also by welding the three thicknesses together at the bottom corners there is provided additional strength at the corners

whereby the lower ends of the edge walls of the bag will support the contents of the bag. Further by welding the corners of the bag as above described, fine granular or powdered products are kept from settling therein. As a result, the corners will be square and neat.

By providing a plastic bag with a bottom closure that retains square and neat corners, the bag has greater sales appeal and is easier to stack since it retains a generally planar bottom. Additionally, less difficulty is encountered in picking up the bag from stacked bags than where bags are "pillow shaped" and have to be laid one on top of the other. Additionally, the bag bottom closure of this invention is relatively inexpensive, especially when it is considered that there are provided square corners when the bag is filled. The bag retains a square bottom formation even when filled with a granular product since there are no bottom corner pockets of a construction that the product can work into. Further, the bag will occupy less space than if the corners were rounded in the manner such as disclosed in FIGURE 3.

In résumé, a preferred method of forming a container of this invention includes the steps of folding a single rectangular sheet of weldable plastic material about crease lines to provide a front wall, a rear wall and in intuck bottom fold made up of two panels joined at a crease line, one panel having an edge parallel to the fold crease line integrally joined to one edge of the front wall and the other panel having an edge parallel to the fold crease line integrally joined to the rear wall, welding together the adjacent contiguous edges of the front wall, the rear wall and the panels that extend perpendicular to the crease lines of the thus folded sheet (including said contiguous edges of the panels) to form a container having an open end; opening the thus formed container to be generally rectangular in cross section and to have generally parallel edge walls, parallel front and rear walls and a container bottom substantially located in a plane parallel to sectional plane; and welding the entire adjacent surface portions of the panels that are parallel to each edge wall to each other and to the adjacent portion of the respective edge wall of the thus opened container. Other patent applications disclosing plastic bag construction that I am aware of that are filed on the same date as the date of filing of this application and assigned to a common assignee are the continuation-in-part application of George H. Ashton, Serial No. 83,094, filed January 16, 1961, now abandoned; the application of Richard H. Ayres, Serial No. 82,899, filed January 16, 1961; the application of Frank L. Hopkins and Richard H. Ayres, Serial No. 82,979, filed January 16, 1961, now abandoned; the application of Donovan D. Wendt, Serial No. 82,898, filed January 16, 1961; and two other applicatons filed by myself on January 16, 1961, Serial No. 82,900, now abandoned, and Serial No. 82,978, now abandoned.

As many widely apparent different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that I do not limit myself to the specific embodiments herein.

What I claim is:

1. A container opened to a filled condition and made of a heat sealable material comprising an open ended tubular body forming edge walls, a front wall and a rear wall, a bottom closure having lateral edges and transverse edges, said transverse edges joined to the contiguous edges of the front and rear walls, and a folded portion for each edge wall, each folded portion having one edge joined to the adjacent lateral edge of the bottom closure and an adjacent corresponding edge joined to the bottom edge of the adjacent edge wall, each edge wall and adjacent folded portion throughout their adjacent face portions being adhered to one another.

2. The container of claim 1 further characterized in that each of the folded portions comprises two triangular portions folded in face to face relationship and that each of said two triangular portions and a corresponding tri-

angular portion of an edge wall are adhered together by being heat sealed throughout their adjacent face portions.

3. A container opened to a filled condition and made of heat sealable material comprising an open ended tubular body forming edge walls, a front wall and a rear wall, a rectangular bottom closure having opposite transverse edges joined to the adjacent front and rear walls respectively, a pair of triangular portions for each edge wall, the triangular portions of each pair being folded in face to face relationship and having integrally joined adjacent edges, a base edge of one portion joined to the contiguous edge of an edge wall and the base edge of the other portion joined to the contiguous lateral edge of the bottom closure, each of the pairs of triangular portions also being welded to each other and to the adjacent edge wall.

4. A container opened to a filled upright condition and made of heat sealable material comprising an open ended tubular body forming edge walls, a front wall and a rear wall, a rectangular bottom closure having opposite transverse edges and opposite lateral edges, one transverse edge being joined to the front wall and the other transverse edge being joined to the rear wall, two pairs of triangular portions, there being one pair of triangular portions adjacent each edge wall, the triangular portions of each pair being folded in face-to-face relationship and having integrally joined adjacent edges, a base edge of one portion being integrally joined to the contiguous edge of the adjacent edge wall and the base edge of the other portion of the same pair being integrally joined to the adjacent lateral edge of the bottom closure, each pair of triangular portions having surfaces generally planar to the adjacent edge wall and welded at said surfaces to each other and to the adjacent edge wall.

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