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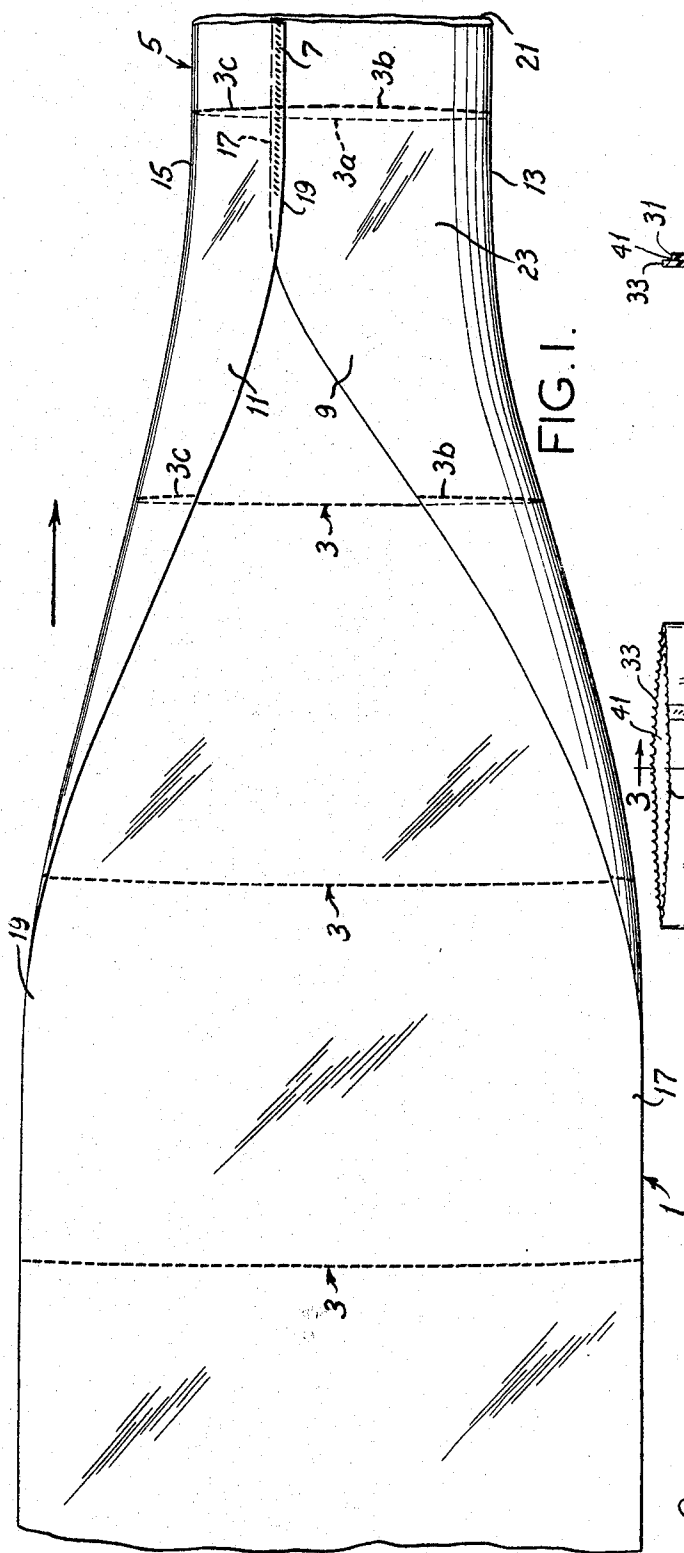


FIG. 1.

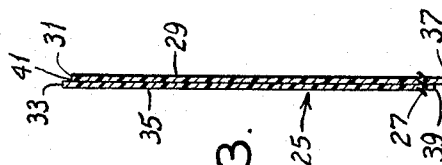


FIG. 3.

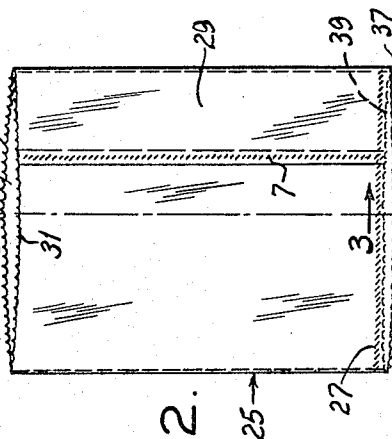


FIG. 2.

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This invention relates to bags, and more particularly to open-mouth plastic bags.

The invention is especially concerned with heavy-duty open-mouth plastic bags, particularly bags made of polyethylene. Such bags are conventionally made with straight registering edges at the mouth, and, because of the tendency of the front and back walls to cling together, are difficult to open for filling. Among the several objects of the invention may be noted the provision of a special mouth construction for plastic bags which facilitates opening thereof for filling, without any undue wastage of the plastic bag material on account of formation of the end seals at the bag mouths after filling. 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 view diagrammatically illustrating certain steps in the method of manufacturing bags according to this invention;

FIG. 2 is a view in elevation of a bag of this invention manufactured according to the FIG. 1 method; and

FIG. 3 is a section taken on line 3-3 of FIG. 2, the bag wall thickness being exaggerated.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to FIG. 1 of the drawings, there is indicated at 1 a continuous web of flexible sheet plastic material, such as heavy-duty polyethylene. This is shown as being fed forward to the right, as indicated by the arrow. As the web is fed forward, lines of weakness such as indicated at 3 are formed therein extending transversely across the web spaced at bag length intervals. In accordance with this invention, each such line is slightly bowed in the same direction (slightly bowed toward the left as viewed in FIG. 1). The lines of weakness may be conventionally formed as lines of perforations across the web. As shown in FIG. 1, each line of weakness may be formed as an arc of a circle having a relatively long radius of curvature in relation to the bag length interval such, for example, that the offset from the chord of the arc (i.e., the line joining the points of intersection of the arc with the side edges of the web) to the center of the arc is from about one-eighth to three-eighths of an inch.

As the web is fed forward, and after the lines of weakness 3 have been formed therein, it is formed into flat tubing as indicated at 5 in FIG. 1 with a longitudinal tube seam (a so-called back seam) indicated at 7 by folding over side portions 9 and 11 of the web on fold lines as indicated at 13 and 15 to bring the side margins 17 and 19 of the web into overlapping relation and securing said side margins together. This securement is conventionally by a seal on a line extending throughout the length of the seam, and may be made, for example, by extruding a bead of molten plastic (e.g., polyethylene) to come between the overlapping margins and squeezing the margins to cause them to become sealed together.

The resultant tubing 5 has the original lines of weakness 3 spaced at bag length intervals therealong, but,

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as a result of folding the web to form the tubing as above described, an intermediate portion 3a of each original line of weakness extends transversely across the unseamed wall 21 of the tubing slightly bowed in one direction (toward the left as viewed in FIG. 1) and the remaining portions 3b and 3c of each original line of weakness form a line extending transversely across the seamed wall 23 of the tubing slightly bowed in the opposite direction.

The tubing 5 is ultimately snapped apart on the lines of weakness to form individual bag tubes, one of which is illustrated in FIGS. 2 and 3 and designated 25, and this is closed at one end as indicated at 27 and left open at the other to form an open-mouth bag. As will be apparent, the bag in effect comprises a generally rectangular segment of the flexible sheet plastic material having side edges (the side edges of the web) and first and second end edges at 3. The side edges are straight and parallel to another. The first end edge is bowed slightly outward from corner-to-corner of the segment and the second end edge is bowed slightly inward from corner-to-corner of the segment, the bow of the second end edge being the reverse of the bow of the first end edge. The segment is formed into the flat tube 25 with longitudinal seam 7 in one wall 29 of the bag (which is conventionally referred to as the back wall). As a result of forming the original lines 3 slightly bowed, and forming the tubing 5 as illustrated in FIG. 1, at the mouth of the bag the edge 31 (which corresponds to a line 3b, 3c) of the back wall 29 is bowed slightly inward and the edge 33 (which corresponds to a line 3a) of the front wall 35 of the bag is bowed slightly outward. At the bottom of the bag, the edge 37 (which corresponds to a line 3b, 3c) of the back wall is bowed slightly outward and the edge 39 (which corresponds to a line 3a) of the front wall is bowed slightly inward. The closure at 27 is formed by sealing the front and back walls together along a line of seal extending transversely across the bag immediately inward of the inwardly bowed edge 39.

In each completed bag, at the mouth end the front wall 35 projects slightly beyond the end edge 31 of the back wall, the extension being designated 41 in FIGS. 2 and 3. This extension 41 is sufficient to be taken between the thumb and the fingers for facilitating the opening of the bag at its mouth preparatory to filling the bag. After the bag has been filled, its mouth end is closed, as by a seal similar to the seal at 27, made immediately inward of the inwardly bowed edge 31 at the mouth.

It has been found that a slight bowing of the lines of weakness 3 sufficient to make extension 41 project from about one-eighth to three-eighths of an inch (as above mentioned) beyond the center of edge 31 is adequate to facilitate the opening of the bag mouth. This minimizes the amount of bag material below the bottom seal 27 and the amount of bag material above the subsequently formed top seal, and thereby avoids undue wastage of the bag material.

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.

What is claimed is:

1. A bag comprising a generally rectangular segment of flexible sheet plastic material having side edges and first and second end edges, the side edges being straight

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and parallel to one another, the first end edge being bowed slightly outward from corner-to-corner of the segment, the second end edge being bowed slightly inward from corner-to-corner of the segment, the bow of the second end edge being the reverse of the bow of the first end edge, said segment being folded on fold lines extending parallel to its side edges into a flat tube and having its side margins overlapping and sealed together to form a longitudinal seam, said tube having opposed walls integrally joined at the sides of the tube along said fold lines, said longitudinal seam extending lengthwise of one of said walls, the end edge of one wall of the tube at one end of the tube being bowed slightly outward and the end edge of the other wall of the tube at said one end of the tube being bowed slightly inward, the end edge of said one wall of the tube at the other end of the tube being bowed slightly inward and the end edge of said other wall of the tube at said other end of the tube being bowed slightly outward, said walls, at one end of the tube, being sealed together on a line of seal extending transversely across the tube immediately inward of the inwardly bowed wall end edge at that end, the tube having an open mouth at its other end, the

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wall of the bag which has the outwardly bowed end edge at said mouth end projecting slightly beyond the other wall to facilitate opening of the mouth of the tube.

2. A bag as set forth in claim 1 wherein each of the end edges of said segment is formed generally as an arc of a circle having a relatively long radius of curvature in relation to the distance between said end edges such that the offset from the chord line joining the points of intersection of the arc with the side edges of said segment to the center of the arc is from about one-eighth to three-eighths of an inch.

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