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PLASTIC BAGS

Filed Feb. 16, 1966

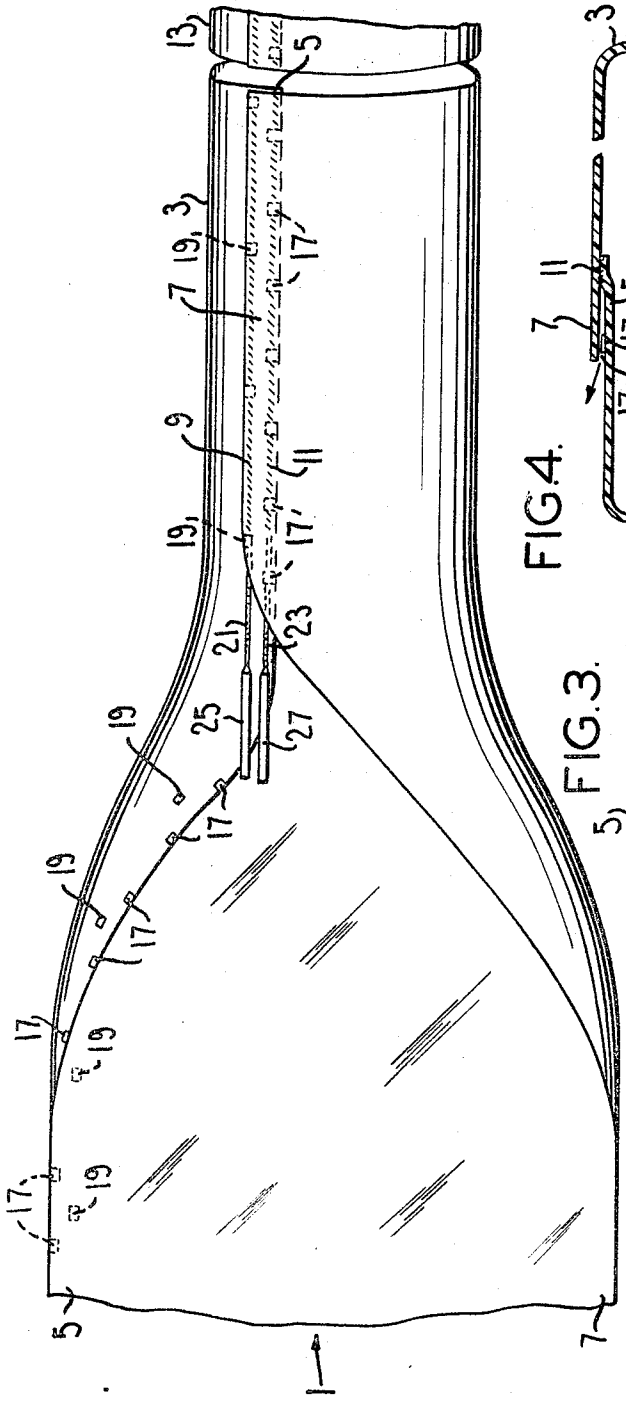


FIG. 1.

FIG. 4.

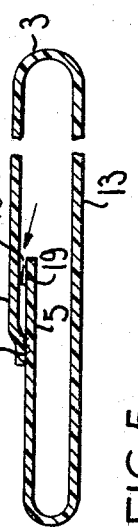


FIG. 5.

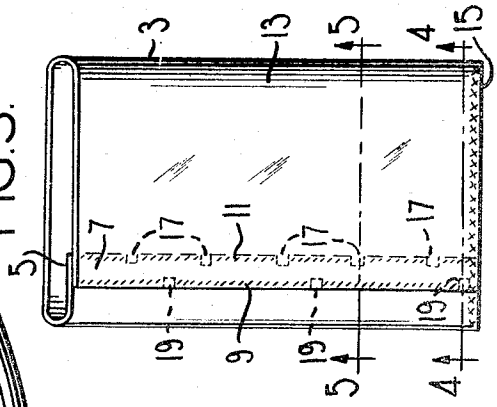


FIG. 3.

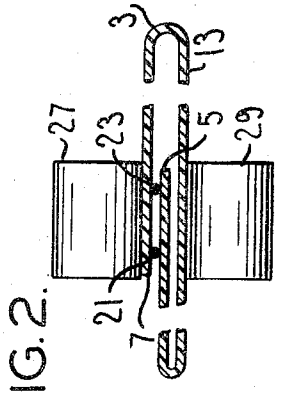


FIG. 2.

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PLASTIC BAGS

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6 Claims. (Cl. 229—53)

Among the several objects of this invention may be noted the provision of an improved plastic bag formed from a length of longitudinally seamed plastic tubing and having vents in the longitudinal seam for venting air from the bag; the provision of such a bag wherein the vents are such as to allow for escape of air from the bag without causing leakage of the contents of the bag; and the provision of a method of economically manufacturing such bags in quantity production. Other objects and features will be in part apparent and in part pointed out hereinafter.

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

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

FIG. 1 is a view illustrating the manufacture of bag tubes to be formed into bags in accordance with this invention;

FIG. 2 is a transverse section illustrating certain rollers not shown in FIG. 1;

FIG. 3 is a view in elevation of a completed bag; and

FIGS. 4 and 5 are enlarged sections on lines 4—4 and 5—5, respectively, of FIG. 3.

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

Referring first to FIG. 1 of the drawing, there is indicated at **1** a continuous web of flexible heat-sealable sheet plastic material such as polyethylene. As appears in FIG. 1, this web is formed into tubing **3** by folding the web to bring its side margins **5** and **7** into overlapping relation, and heat-sealing the lapping margins together on two spaced lines of seal **9** and **11** extending lengthwise of the tubing thereby to form a longitudinal seam for the tubing. In accordance with this invention, provision is made for inhibiting sealing together of the lapping margins at points spaced along the stated lines of seal thereby to provide gaps constituting vents in each of said lines of seal with the gaps in one line offset longitudinally of the tubing from the gaps in the other line. The tubing **3** is segmented into individual bag tubes such as the tube **13** shown at the right in FIG. 1 and shown in FIG. 3, and each bag tube is provided with a closure at least at one end thereof as indicated at **15** in FIG. 3.

Further in accordance with this invention, the inhibition of sealing together of the lapping margins of the web is effected by applying to the web, prior to its being formed into tubing, a first and a second series of spots of heat-seal-inhibiting material (an adhesive material) on lines extending lengthwise of the web which ultimately coincide with the lines of seals **9** and **11**. As shown, the spots of the first series are designated **17** and the spots of the second series are designated **19**. The spots **17** lie on a line closely adjacent and parallel to the upper edge of the web as viewed in FIG. 1. The spots **19** lie on a line spaced inward from and parallel to the line of spots **17**. Spots **17** are shown as uniformly spaced along the length of the web a suitable distance (typically five inches in the case of bags twenty-seven inches long and eighteen inches wide) and spots **19** are shown as uniformly spaced twice that distance, each lying midway between two spots **17**. Both series of spots are applied to the bottom face of the web as shown at the left in

FIG. 1, and, when the web is formed into tubing **3**, the lower margin **7** of the web is brought over to lie on the outside of the margin **5** bearing the spots (which lie on the upper face of the folded-over margin **5**), with the spots on margin **5** facing the overlying margin **7**.

As illustrated in FIGS. 1 and 2, the heat-sealing together of the lapping margins of the web on lines of seal **9** and **11** is effected by extruding two beads **21** and **23** of molten thermoplastic material (e.g., polyethylene) out of two extrusion nozzles **25** and **27** onto margin **5** of the web prior to its being lapped by the margin **7** of the web. Then the lapped margins, with the molten beads of thermoplastic therebetween, are squeezed together as by means of rolls **27** and **29** shown in FIG. 2 (omitted in FIG. 1) to complete the sealing operation. The beads of thermoplastic are extruded onto margin **5** on lines coincident with the lines of spots **17** and **19** on the margin **5** overlapped by margin **7**. Heat-sealing together of margins **5** and **7** is prevented at spots **17** and **19** by reason of the heat-seal-inhibiting characteristic of these spots so that, at each spot, there is a gap in the respective line of seal. The gaps, shown opened up in exaggerated fashion in FIGS. 4 and 5, are designated **17***a* and **19***a*.

The heat-seal-inhibiting material of the spots **17** and **19** may be, for example, a commercially available polyamide-base ink, which may be pigmented or unpigmented, as desired. The spots may be printed on the web at the same time other matter (e.g., designation of contents, brand name) is printed on the web. While the spots are shown as being printed on margin **5** of the web, it will be understood that they could be printed on margin **7** (in which case they would be printed on the upper face of margin **7** as viewed in FIG. 1). Or one series of spots could be printed on margin **5** and the other on margin **7**.

A completed bag B as shown in FIG. 3 comprises tube **13** of the flexible heat-sealable sheet material having a longitudinal seam in one wall thereof wherein margins **5** and **7** of the tube material are overlapped and heat-sealed together on the two spaced apart lines of seal **9** and **11** extending lengthwise of the tube. As illustrated in FIG. 3, the bag is an open-mouth bag, closed at one end only by closure **15**, which may be a heat seal extending transversely across the lower end of the tube. It will, of course, be understood that the tube may be formed into a valve bag having closures at both ends with a suitable valve arrangement for filling the bag. Each of the lines of seal **9** and **11** has a series of gaps therein at spots **17** and **19**, respectively, with the gaps in one line offset with respect to the gaps in the other providing vents in one line of seal, namely the line **11** (see the gap or vent **19***a* in FIG. 5) from the inside of the bag to the space between the overlapping margins **5** and **7** bounded by the lines of seal **9** and **11** and vents in the other line of seal, namely the line **9** (see the gap or vent **17***a* in FIG. 4) from said space to the outside of the bag. The gaps are provided, as is apparent, by the two series of spots **17** and **19** of heat-seal-inhibiting material. Air is adapted to pass from the inside of the bag through the gaps or vents at spots **19**, thence lengthwise of the bag along the passage in the longitudinal seam of the bag bounded by lines of seal **9** and **11**, and thence out through the gaps or vents at spots **17**. The nature of the gaps or vents at spots **19** is such as substantially to preclude leakage of contents of the bag out through these vents, and such small amount as may leak out through these vents is trapped in the longitudinal seam by reason of the offset of the gaps or vents at spots **17** from the gaps or vents at spots **19**.

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 and methods 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. The method of making vented bags of flexible heat-sealable sheet material comprising forming a web of said material into tubing by folding the web to bring its side margins into overlapping relation and heat-sealing said lapping margins together on two spaced lines of seal extending lengthwise of the tubing while inhibiting sealing together of the lapping margins at points spaced along said lines of seal thereby to provide gaps constituting vents in each of said lines of seal with the gaps in one line offset from the gaps in the other, segmenting the tubing into individual bag tubes, and forming a closure for each bag tube at least at one end thereof.

2. The method of claim 1 wherein the inhibition of sealing together of said lapping margins at said points is effected by applying to the web, prior to its being formed into tubing, a first series and a second series of spots of heat-seal-inhibiting material on lines extending lengthwise of the web which ultimately coincide with said lines of seal.

3. The method of claim 2 wherein the lapping margins are heat-sealed together on said lines by extruding two beads of molten thermoplastic onto one of said margins prior to its being lapped by the other margin and squeezing together the lapping margins with said beads therebetween.

4. The method of claim 2 wherein said spots are applied to one face of the web along two lines adjacent one edge of the web.

5. A vented bag comprising a tube of flexible heat-sealable sheet material having a longitudinal seam wherein margins of the tube material are overlapped and heat-sealed together on two spaced-apart lines of seal extending lengthwise of the tube, said tube being closed at least at one end, each of said lines of seal having a series of gaps therein with the gaps in one line offset with respect to the gaps in the other providing vents in one line of seal from the inside of the bag to the space between said overlapping margins bounded by said lines of seal and vents in the other line of seal from said space to the outside of the bag.

6. A vented bag as set forth in claim 5 wherein said gaps are provided by a first series of spots of heat-seal-inhibiting material between said overlapping margins spaced along one of said lines of seal and a second series of spots of heat-seal-inhibiting material spaced along the other of said lines of seal.

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