

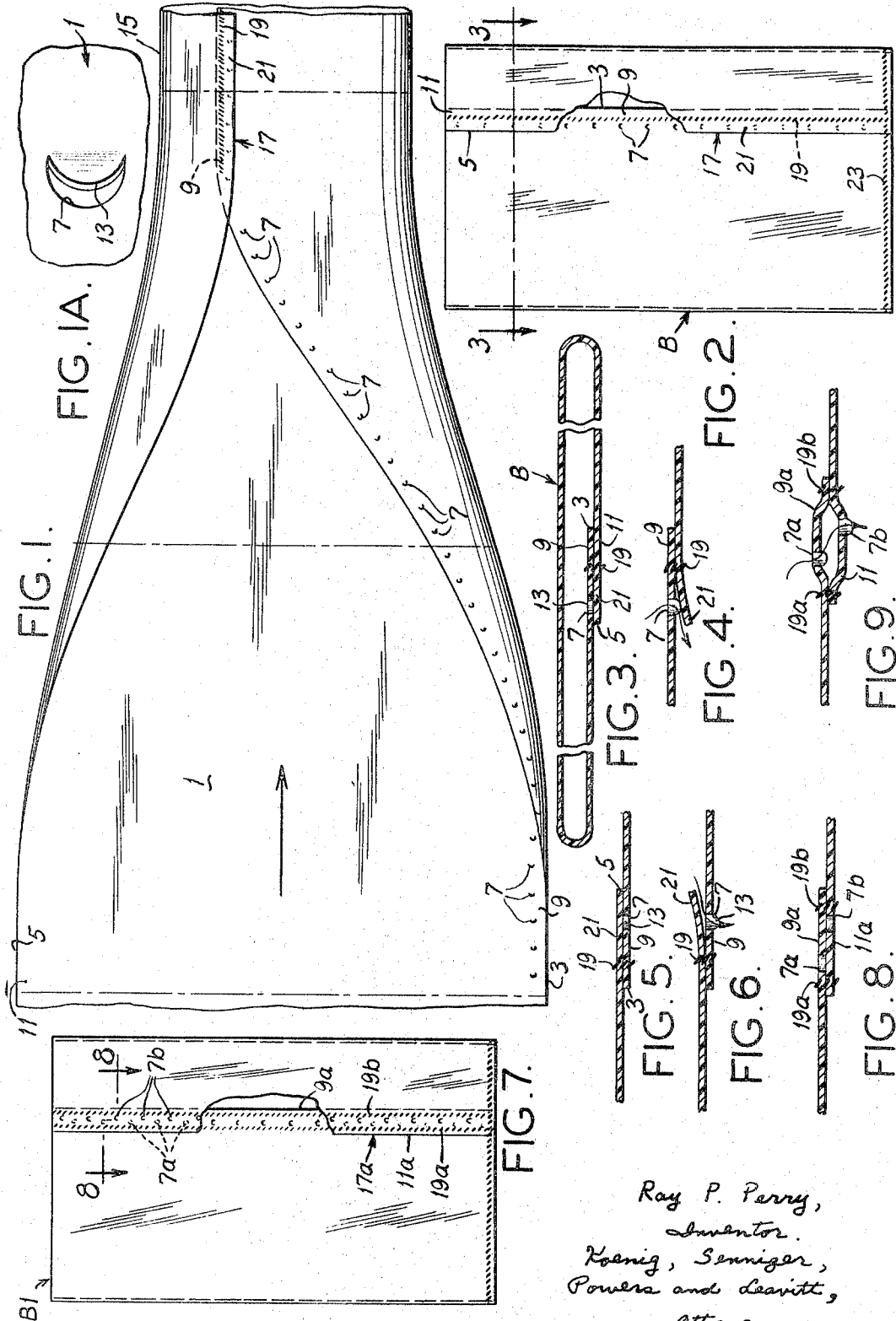
Feb. 7, 1967

R. P. PERRY

3,302,859

BAG

Filed Dec. 21, 1964



Ray P. Perry,
Inventor.
Koenig, Senniger,
Powers and Leavitt,
Attorneys.

1

3,302,859
BAG

Ray P. Perry, Excelsior, Minn., assignor to Bemis Company, Inc., Minneapolis, Minn., a corporation of Missouri

Filed Dec. 21, 1964, Ser. No. 419,740
20 Claims. (Cl. 229-53)

The invention is especially concerned with heavy-duty plastic bags, made of polyethylene or the like, such as are used for fertilizer, dry chemicals, etc. Unless such a bag is vented for escape of air, air entrapped in the bag contents upon filling the bag is retained in the bag and causes it to remain inflated (like a balloon), noting that the plastic material from which the bag is formed is substantially air-impervious. This interferes with stacking of the filled bags. Thus, it is desirable to provide for venting of air from such bags, but it is equally important that such bags be resistant to entry of moisture for protection of the contents from the effects thereof. Accordingly, among the several objects of the invention may be noted the provision of improved constructions for such bags adapted effectively to provide for venting of entrapped air while excluding moisture from the bag; and the provision of methods of economically manufacturing such vented plastic 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 hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings, in which several of various possible embodiments of the invention are illustrated,

FIG. 1 is a view illustrating certain steps in a method of manufacturing vented plastic bags of this invention;

FIG. 1A is a fragmentary perspective illustrating a vent;

FIG. 2 is a view in elevation of a bag of this invention made according to FIG. 1, with part of the bag broken away;

FIG. 3 is an enlarged section taken on line 3-3 of FIG. 2;

FIG. 4 is a fragmentary section showing how air is vented from the FIG. 2 bag;

FIG. 5 is a fragmentary section illustrating a modification;

FIG. 6 is a view similar to FIG. 5 showing how air is vented;

FIG. 7 is a view in elevation of a bag showing another modification;

FIG. 8 is a fragmentary section taken on line 8-8 of FIG. 7; and

FIG. 9 is a view similar to FIG. 8 showing how air is vented.

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. One edge of the web is designated 3, and its other edge is designated 5. As it is fed forward, vents 7 are cut in the web in a series extending along one margin of the web designated 9 adjacent edge 3. The other margin of the web adjacent edge 5 is designated 11.

Vents 7 are preferably constituted by narrow slits in margin 9 of the web, with these slits of such shape as to provide tongues 13 adapted to flex out of the plane of the web to provide relatively large vent openings (see FIG. 1A). As shown, these slits may be of generally C-shape or crescent-shape. When normally flat in the

2

plane of the web, tongues 13 substantially close the vents.

As the web 1 is fed forward, and after the vents 7 have been cut therein, it is formed into flat tubing as indicated at 15 in FIG. 1 with a longitudinal tube seam (a so-called back seam) indicated generally at 17 by bringing margins 9 and 11 into overlapping relation and securing the margins together. As illustrated in FIG. 1, this securement is by a seal 19 on a line extending throughout the length of the seam. This seal may be made, for example, by extruding a bead of molten plastic (e.g., polyethylene) to come between the overlapping margins 7 and 9 and squeezing the margins so that they become sealed along the line 19.

As shown in FIG. 1, the web 1 is formed into tubing 15 with margin 9 having vents 7 therein on the inside of margin 11, with the seal 19 lying between the vents and edge 3 of margin 9, and with the overlap of such width that portion 21 of margin 11 between the seal and edge 5 of margin 11 forms a valve flap normally overlying and covering the vents. Tubing 15 is segmented on lines such as indicated at L in FIG. 1 spaced at bag length intervals into individual bag tubes, and each such tube is formed into a bag B as shown in FIG. 2 by forming an end closure at one end (the bottom) of the tube. This closure may be formed as, for example, by heat-sealing the walls of the tube together on a line of seal 23 extending across the tube.

The resultant bag B (which is an open-mouth bag) is thus formed from a tube having the longitudinal seam 17 comprising overlapping margins 9 and 11 of the plastic web material, these margins being secured together throughout their length by the seal at 19. Margin 9, which is the inner margin in the longitudinal seam, has the series of vents 7 therein for escape of air, with these vents located on the opposite side of the seal 19 from the edge 3 of margin 9 and normally covered by the overlying valve portion 21 of margin 11. The bag B is filled through its open mouth, and the mouth is then closed in suitable manner, as by a seal corresponding to that at 23. Air entrapped in the bag may readily escape through the vents 7 as illustrated in FIG. 4, the pressure of the air forcing open the tongues 13 and the flap 21 for exit of air. Upon the escape of air, and the resultant decrease of pressure within the bag, tongues 13 close and flap 21 closes over the vents effectively to close them against entry of moisture from outside the bag.

FIGS. 5 and 6 show a modification of the above in which the disposition of margins 9 and 11 is reversed, i.e., margin 9 is on the outside and margin 11 (including the flap 21) is on the inside. In this instance, it is the outer margin which has vents 7 therein located on the opposite side of seal 19 from the edge of the outer margin, with flap 21 on the inside underlying and normally closing the vents. FIG. 6, in exaggerated fashion, shows how air escapes underneath flap 21 and thence through the vents. After escape of air, flap 21 presses tight against the inside of the outer margin (9 in this case) and the tongues of the vents close back into the plane of the outer margin effectively to close the vents against entry of moisture. The modification of FIGS. 5 and 6 may be made in a manner similar to that illustrated in FIG. 1 except, of course, that the tubing 15 is formed with margin 9 on the outside and margin 11 on the inside.

FIGS. 7-9 illustrate a further modification of the invention, showing a bag B1 having a longitudinal seam 17a comprising overlapping margins 9a and 11a of the plastic material from which the tube is formed, secured together in this instance by two spaced seals 19a and 19b extending throughout their length. Each of margins 9a and 11a has a series of vents 7a and 7b for escape of air from the bag, with the vents in one margin being offset

3

from the vents in the other margin. FIG. 9 shows how air escapes through the vents 7a in the inner margin 9a, to the space between the margins bounded by the seals 19a and 19b (the margins puffing apart to some extent due to air pressure as exaggeratedly illustrated in FIG. 9), and thence through the vents 7b in the outer margin 11a. Upon escape of air, the margins flatten out against one another and the vents are effectively closed against entry of moisture. It will be understood that the FIG. 7 bag may be made in a manner similar to FIG. 1, except that vents are cut in both margins of the web, and two seals are made in the longitudinal seam instead of one.

While the invention is above described as applied to an open-mouth bag, it will be understood that it is of course applicable to a valve bag.

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. A bag formed from a tube having a longitudinal seam comprising overlapping margins of the material from which the tube is formed, said margins being secured together throughout their length, one of said margins having a series of vents therein for escape of air from the bag, said vents being normally covered by the other margin.

2. A bag as set forth in claim 1 wherein the vents are constituted by slits in said one margin, said slits being of such shape as to provide tongues adapted to flex out of the plane of said one margin.

3. A bag as set forth in claim 2 wherein the slits are generally C-shaped.

4. A bag formed from a tube having a longitudinal seam comprising overlapping margins of the material from which the tube is formed, said margins being secured together throughout their length by a seal, one of said margins having a series of vents therein located with respect to the seal for escape of air from the bag, said vents being located adjacent the line of seal and, the portion of the other margin between the seal and its edge constituting a valve flap normally covering the vents.

5. A bag as set forth in claim 4 wherein the vents are constituted by slits in said one margin, said slits being of such shape as to provide tongues adapted to flex out of the plane of said one margin.

6. A bag as set forth in claim 5 wherein the slits are generally C-shaped.

7. A bag formed from a tube having a longitudinal seam comprising overlapping margins of the material from which the tube is formed, said margins being secured together throughout their length by a seal, the inner of said margins having a series of vents therein for escape of air from the bag located on the opposite side of said seal from the edge of said inner margin, the portion of the outer margin between the seal and the edge of said outer margin constituting a valve flap normally overlying and covering the vents.

8. A bag as set forth in claim 7 wherein the vents are constituted by slits in said inner margin, said slits being of such shape as to provide tongues adapted to flex outward from said inner margin.

9. A bag as set forth in claim 8 wherein the slits are generally C-shaped.

10. A bag formed from a tube having a longitudinal seam comprising overlapping margins of the material

4

from which the tube is formed, said margins being secured together throughout their length by a seal, the outer of said margins having a series of vents therein for escape of air from the bag located on the opposite side of the seal from the edge of said outer margin, the portion of the inner margin between the seal and the edge of said outer margin constituting a valve flap normally underlying and covering the vents.

11. A bag as set forth in claim 10 wherein the vents are constituted by slits in said outer margin, said slits being of such shape as to provide tongues adapted to flex outward from said outer margin.

12. A bag as set forth in claim 11 wherein the slits are generally C-shaped.

13. A bag formed from a tube having a longitudinal seam comprising overlapping margins of the material from which the tube is formed, said margins being secured together throughout their length by two spaced seals, each of said margins, in the region thereof between said seals, having a series of vents therein for escape of air from the bag, the vents in one margin being offset from the vents in the other.

14. A bag as set forth in claim 13 wherein the vents are constituted by slits in said margins, said slits being of such shape as to provide tongues adapted to flex outward from said margins.

15. A bag as set forth in claim 14 wherein the slits are generally C-shaped.

16. The method of making vented bags from a continuous web of bag material comprising forming a series of vents extending along at least one margin of the web, forming the web into tubing with a longitudinal tube seam by bringing the side margins of the web into overlapping relation and securing them together with the vents in communication with the inside of the tubing and covered by the other margin, segmenting the tubing into individual bag tubes, and forming an end closure on each tube.

17. The method of making vented bags from a continuous web of bag material comprising forming a series of vents extending along one side margin of the web, forming the web into tubing with a longitudinal tube seam by bringing the side margins of the web into overlapping relation and securing them together throughout their length by a seal, the seal being located so that the vents are in communication with the inside of the tubing and are covered by the portion of the other margin between the seal and the edge of the other margin, segmenting the tubing into individual bag tubes, and forming an end closure on each tube.

18. The method of claim 17 wherein said one margin is brought on the inside of the other margin.

19. The method of claim 17 wherein said one margin is brought on the outside of the other margin.

20. The method of making vented bags from a continuous web of bag material comprising forming a series of vents extending along each side margin of the web, forming the web into tubing with a longitudinal tube seam by bringing the side margins into overlapping relation and securing them together throughout their length by two spaced seals, with the vents in each margin between said seals and the vents in one margin offset from the vents in the other, segmenting the tubing into individual bag tubes, and forming an end closure on each tube.

References Cited by the Examiner

UNITED STATES PATENTS

2,997,224	8/1961	Stannard	229—53
3,237,844	3/1966	Hughes	229—53

FRANKLIN T. GARRETT, *Primary Examiner.*