

[54] VALVE BAG
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150/3

[56] References Cited

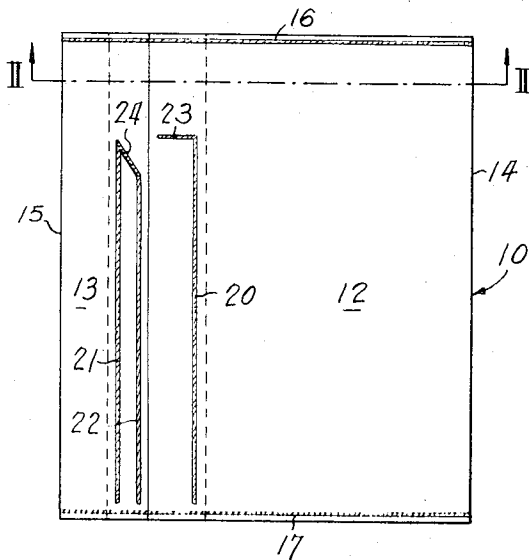
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[57] ABSTRACT

A valve bag comprising a back wall and a front wall made of first and second panels partially overlapping each other, said front and back walls being joined along their entire periphery, the first panel having at least two plies and the second panel projecting between the plies of said first panel, and a transverse seal at a distance from the top end of the bag uniting the two panels in their common area of overlap and defining between said second panel and the plies of the first panel a tubular self-closing opening extending transversely of the bag adjacent the top thereof, said panels in their common area of overlap being also united along at least one line extending from the transverse seal to the bottom of the bag, said tubular opening being of such diameter and being so located transversely of the bag as to allow insertion therethrough of a filling spout and free delivery of filling material from said spout.

5 Claims, 2 Drawing Figures



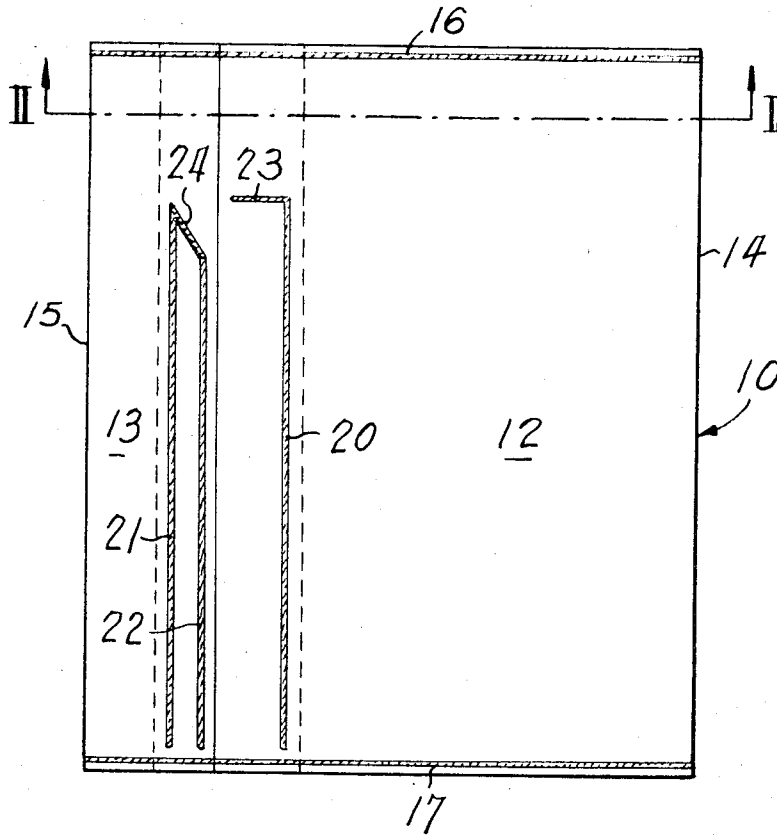


FIG. 1

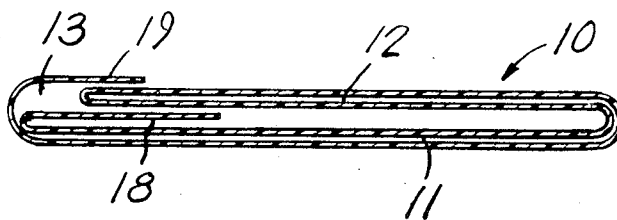


FIG. 2

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VALVE BAG

This invention relates to a plastic valve bag suitable for manufacture by automatic bag making equipment in line with a plastic film extrusion process.

Valve bags are in general used for packaging materials such as fertilizers and cement. These bags possess the important commercial advantage of easy filling through a valve structure and self-closing of this valve structure after filling. However, the presence of the valve in the bag structure introduces problems in bag manufacture. In plastic bags suitable for the industrial packaging and shipping of powdered or granular products, the valve flap normally consists of a section of the same thickness as that of the main bag wall for providing valve strength and of a thinner flexible membrane for providing the required anti-sift characteristics. The complexity of the equipment required to automatically produce and insert this type of valve configuration has been a major drawback in automatic plastic valve bag manufacture.

It has now been found that a valve bag can be provided which has its valve constructed of overlapping panels in the front wall of the bag and which can be manufactured employing automatic bag making equipment.

It is therefore the primary object of this invention to provide a valve bag which can be readily and automatically manufactured and which is free of the above-described disadvantages inherent in prior art valve bags. Additional objects of the invention will appear hereinafter.

The valve bag in accordance with the invention comprises a back wall and a front wall made of first and second panels partially overlapping each other, said front and back walls being joined along their entire periphery, the first panel having at least two plies and the second panel projection between the plies of said first panel and a transverse seal at a distance from the top end of the bag uniting the two panels in their common area of overlap panel and defining between said second and the plies of the first panel a tubular self-closing opening extending transversely of the bag adjacent the top thereof, said panels in their common area of overlap being also united together alone at least one line extending from said tubular opening to the bottom of the bag, said tubular opening being of such diameter and being so located transversely of the bag as to allow insertion therethrough of a filling spout and free delivery of filling material from said spout.

The invention is illustrated in the accompanying drawings wherein:

FIG. 1 is an elevational view of a two-ply valve bag constructed in accordance with the principles of the present invention, and

FIG. 2 is a sectional view along line II-II of FIG. 1.

In the particular embodiment illustrated in the drawings, a generally rectangular pillow case type bag is shown having a two-ply back wall 11 and a front wall made of two-ply partially overlapping panels 12 and 13. Panels 12 and 13 are integral with back wall 11 at their opposed side edges 14 and 15 and form with said back wall a flattened two-ply tube which is closed at both ends by transverse seals 16 and 17. As is clearly shown in FIG. 2, the overlap between panels 12 and 13 is of a special type in that the free edge of panel 12 is telescoped between the inner ply 18 and the outer ply 19

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of panel 13. For reasons which will become apparent hereinafter, the inner ply 18 of panel 13 is preferably although not necessarily somewhat wider than the outer ply 19. Extending from transverse seal 17 to a line extending generally transversely of the bag and at a distance from transverse seal 16 which defines the top of the bag, are seal 20 near the free edge of ply 18 of panel 13 uniting said ply 18 with the two plies of panel 12 and seal 21 near the free edge of panel 12 uniting all the plies of both panels 12 and 13. A further seal 22 extending to a point short of the top extremity of seal 21 is provided near the free edge of the ply 19 also uniting all plies of panels 12 and 13. The portion left unsealed in the common area of overlap of panels 12 and 13 adjacent the top end of the bag constitutes a tubular valve opening suitable for insertion of a filling spout not shown.

When it is desired to fill the bag, a filling spout is introduced into the bag through the tubular valve by first inserting it between panel 12 and outer ply 19 of panel 13 and thence between panel 12 and inner ply 18 of panel 13. As should be readily apparent, seal 22 is shorter than seal 21 in order to make the filling spout insertion easier. It should be understood, however, that this is a preferred embodiment and that seal 22 can be as long as seal 21. To reinforce the side of the tubular valve opposite the top end of the bag it has been found advantageous to provide generally transverse seals 23 and 24. Such seals which are shown as continuous need not be so and can be replaced by dot seals or maze seals. Seals 20, 21 and 22 also shown as continuous, can be also replaced by maze seals.

It should be understood that the combination of seals 20, 21, 22, 23 and 24, particularly illustrated in the drawings, is not critical and can be replaced, for instance, by a seal having the configuration of an inverted L extending from the bottom of the bag in the common area of overlap between panel 12 and plies 18 and 19 of panel 13 and then transversely of the bag to the free edge of ply 18.

While in the drawings, the valve opening is shown as being located substantially close to one side of the bag, it should be understood that it can be located anywhere adjacent transverse seal 16, provided that sufficient space is left between it and the side edges of the bag to allow insertion of a reasonably long filling spout and free delivery of filling material therefrom. It is thus seen that the location of the valve opening transversely of the bag may vary with the width of the bag. Generally, it has been found suitable to locate the valve opening within the vertical half of the bag opposite the vertical side of the bag facing the inner mouth of the valve opening.

To facilitate insertion of a filling spout through the valve into the bag, it is preferable that the extent of overlap between outer ply 19 and panel 12 be rather limited. It should be readily seen that with this preferred arrangement it is easier to lift the unsealed portion of outer ply 19 with the filling spout, then reach the free edge of panel 12 and finally insert the spout between inner ply 18 and panel 12. It is for the same reason that transverse seal 24 is inclined such as illustrated in FIG. 1.

The particular two-ply bag shown in the drawings is preferably fabricated from a tubing of appropriate transverse dimension, said tubing being seamless and consisting of a film of a thermoplastic resinous mate-

rial. Any heat sealable thermoplastic resinous material or plastic sheet material sealable by heat, hot melt adhesive, a compatible adhesive, combinations of adhesives and tapes, etc. may be used to construct the bag of the invention. Among all those materials the preferred one, for reasons which are readily apparent to those versed in the art, is polyethylene.

In making the bag, a flattened tubing is continuously fed to a bag making machine where one wall of the tubing is slit longitudinally close to one fold and that fold is thereafter flattened. A longitudinally folded web results having one ply somewhat wider than the other, which is then passed over a suitable A-frame where it is further folded longitudinally to form a double ply tubing adapted to form back wall 11 and overlapping panels 12 and 13 of the bag. The common area of overlap between panels 12 and 13 is provided at regular longitudinal intervals with seals 20, 21 and 22 as well as with seals 23 and 24. The double ply tubing is finally transversely sealed and cut at regular intervals to provide bags such as shown in the drawings.

As best shown in FIG. 1, it is preferred that seals 20, 21 and 22 stop short of and thus do not intersect with transverse seal 17 at the bottom of the bag. The reason for this is that the intersection of seals 20, 21 and 22 with seal 17 results in weakening of the latter seal at the points of intersection and thus is weakening the bottom of the bag.

While the invention has been described in connection with a double ply bag, it should be understood that the principles thereof are applicable to the fabrication of bags wherein the back wall 11 and panel 12 have one or more than two plies. The important feature in all such bags is that panel 13 of the front wall 12 has at

least two plies and that panel 12 projects between the plies of panel 12.

What we claim is:

1. A valve bag comprising a back wall and a front wall made of first and second panels partially overlapping each other, said front and back walls being joined along their entire periphery, the first panel having at least two plies and the second panel projecting between the plies of said first panel, and a transverse seal at a distance from the top end of the bag uniting the two panels in their common area of overlap and defining between said second panel and the plies of the first panel a tubular self-closing opening extending transversely of the bag adjacent the top thereof, said panels in their common area of overlap being also united along at least one line extending from the transverse seal to the bottom of the bag, said tubular opening being of such diameter and being so located transversely of the bag as to allow insertion therethrough of a filling spout and free delivery of filling material from said spout.

2. A valve bag as claimed in claim 1 wherein the back wall and first and second panels of the front wall each have two plies.

3. A valve bag as claimed in claim 1 wherein the plies of the first panel which are located externally of the second panel are narrower than the plies which are located internally of said second panel.

4. A valve bag as claimed in claim 1, wherein the bag is constructed of heat sealable plastic film.

5. A valve bag as claimed in claim 1, wherein the bag is constructed of polyethylene film.

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