

Dec. 23, 1958

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2,865,556

BAG

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3 Sheets-Sheet 1

FIG. 1.

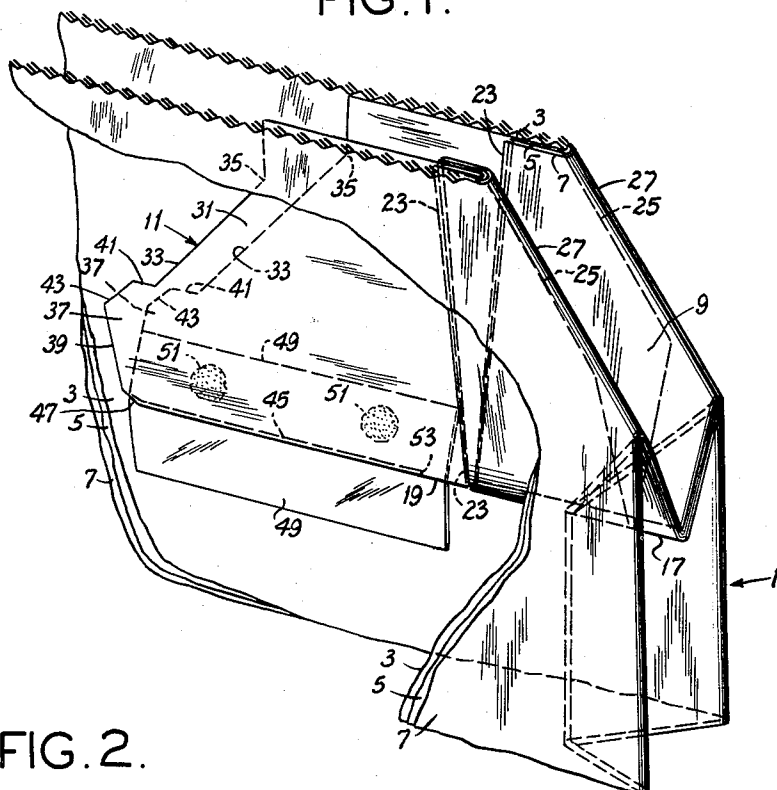


FIG. 2.

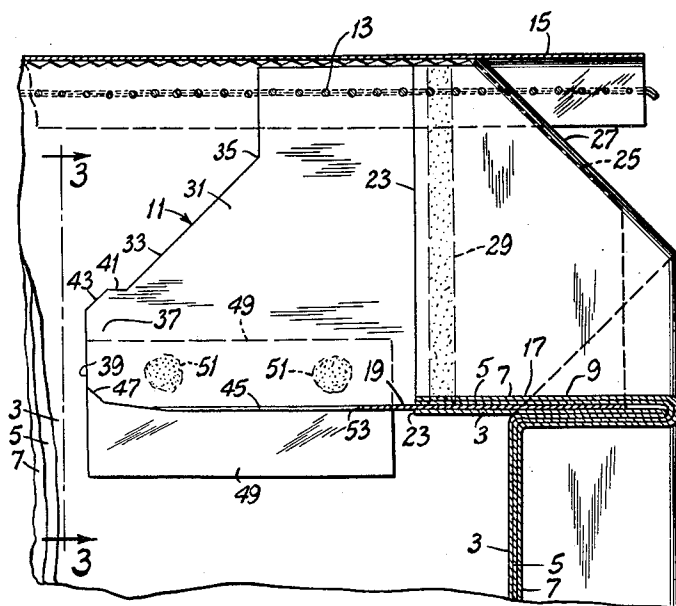
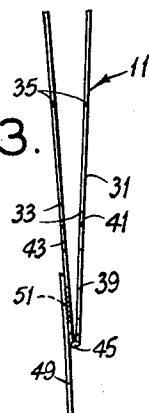


FIG. 3.



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FIG. 6.

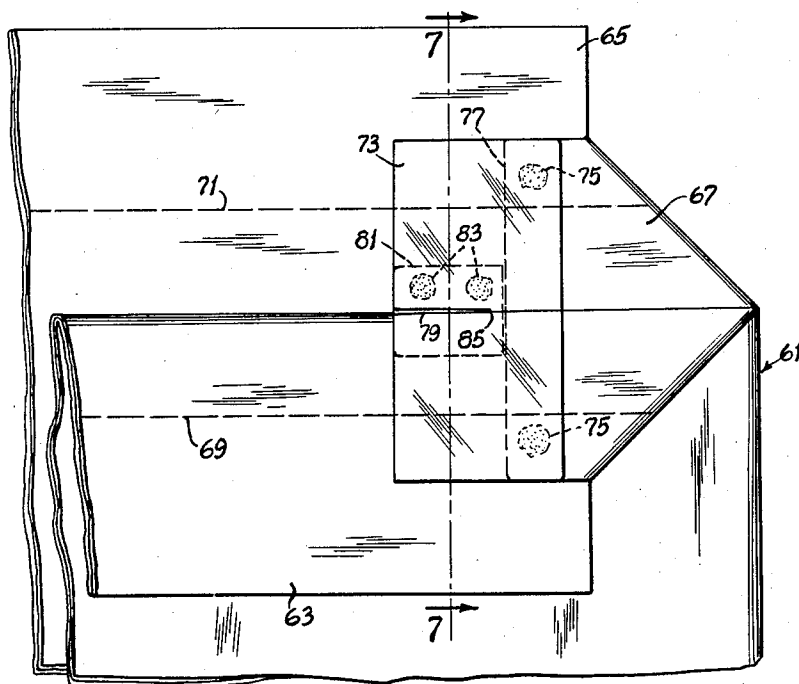


FIG. 7.

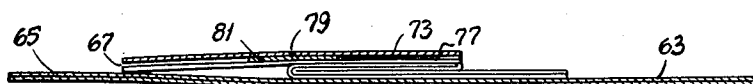
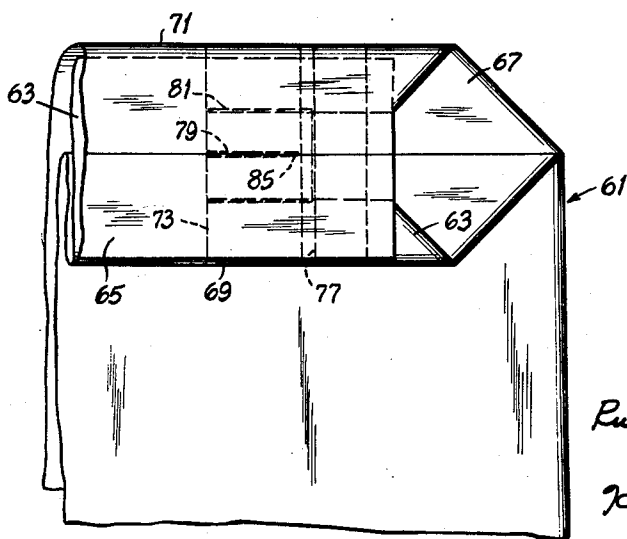


FIG. 8.



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Application January 11, 1956, Serial No. 558,542

11 Claims. (Cl. 229—62.5)

This invention relates to bags, and more particularly to valve bags such as are used for finely divided or pulverized materials (fertilizer, for example) and which are filled by means of a filling spout received in the valve.

Among the several objects of the invention may be noted the provision of a bag of the class described having an improved valve construction which permits free flow of material from the filling spout into the bag so as to avoid clogging, and which provides for tight closure of the bag upon removal from the filling spout after the bag has been filled; the provision of a valve construction such as described which includes a special check valve member which is adapted to permit the stated free flow of material into the bag during the filling of the bag and which closes when the bag has been filled; and the provision of a bag with a valve construction having the stated characteristics which is economical to manufacture. 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 several of various possible embodiments of the invention are illustrated,

Fig. 1 is a perspective illustrating a bag having a valve of this invention as it appears prior to sewing the bag closed at its valved end, parts being broken away;

Fig. 2 is a vertical cross section in the central plane of the valve, showing the bag provided with the sewn closure;

Fig. 3 is a view taken on line 3—3 of Fig. 2;

Fig. 4 is a plan of a valve sleeve per se used in the bag shown in Figs. 1 and 2;

Fig. 5 is a perspective, with parts broken away and shown in section, illustrating the valve sleeve in a semi-flattened condition;

Fig. 6 is a view of the valve corner portion of a pasted closure type of bag of this invention, parts being shown in a condition assumed during the formation of the closure;

Fig. 7 is an enlarged cross section taken on line 7—7 of Fig. 6; and,

Fig. 8 is a view corresponding to Fig. 6 showing the completed closure.

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

Referring to the drawings, there is indicated at 1 in Figs. 1, 2 and 5 a multi-ply paper bag which is provided with a valve of this invention. As shown, the bag is a gusseted bag having three plies. The inner ply is designated 3, the intermediate ply is designated 5 and the outer ply is designated 7. It will be understood that the basic principles of the invention are applicable to a bag having any number of plies, or even to a single-ply bag.

The bag has a valve formation adapted to receive a filling spout comprising a conventional tucked-in valve

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flap 9 at one of the corners at the upper end of the bag. The valve formation includes an inwardly projecting flexible valve extension constituted by a valve sleeve 11 projecting from the inner end of the valve flap into the bag. As shown in Figs. 1—3 and 5, the valve sleeve 11 (illustrated per se in Fig. 4) comprises a blank of flexible paper which is inserted between the inner ply 3 and the intermediate ply 5 after the tucking in of the valve flap 9. After the insertion of the sleeve in the tucked-in valve flap 9, the respective end of the bag is provided with a closure indicated at 13 (see Figs. 2 and 5). As shown, this closure comprises a conventional stitched seam securing together the front and back walls of the bag, also including a paper tape 15 folded around the mouth of the bag, the folded tape being caught by the stitching. The valve flap 9 has a central fold indicated at 17 and sleeve 11 is folded in half on a central fold 19 in line with and in extension of the fold 17, folds 17 and 19 being spaced from closure 13.

The sleeve 11 is shaped to have a base portion 21 having a total width corresponding to the total width of the inner end edge 23 of the valve flap. The outer corners of the base portion of the sleeve are cut off at a 45° angle as indicated at 25, and the sleeve is inserted between the inner ply 3 and the intermediate ply 5 to the point where these 45° angled corners 25 engage the 45° folds 27 on which the valve flap 9 is folded in. As shown best in Fig. 2, the sleeve is pasted to the inner ply 3 adjacent the inner end edge 23 of the valve flap by means of a stripe of adhesive 29, such as paste, extending from one side edge of the base portion 21 of the sleeve to the other side edge of the base portion. This stripe of adhesive prevents sifting of the contents of the bag between the inner ply 3 and the sleeve. It will be understood that under some circumstances it may be more desirable from the manufacturing standpoint to adhere the sleeve to the inner ply by means of spots of adhesive, rather than a continuous stripe of adhesive, to avoid undue stiffening of the bag where it needs to be folded to tuck in the valve flap. Thus, when spots are used instead of a stripe of adhesive, the spots are so located as not to be coincident with folds 27. The base portion projects inward for some distance from the inner end edge 23 of the valve flap 9 and the side margins of the base portion are caught in the end closure 13.

The sleeve 11 has a reduced portion generally designated 31 projecting inward from the base 21. This portion 31 is folded in half on the central fold 19 of the sleeve. It is so shaped that, as folded in half in the bag, its two halves have inclined edges 33 which converge toward the central fold 19 of the sleeve in inward direction (see Figs. 1 and 2). These edges 33 intersect the base portion 21 at points 35 within (below) the end closure 13. Accordingly, portion 31 is free of the closure 13. As shown, edges 33 preferably converge toward the central fold at an angle of 45°. Portion 31 has a nose 37 defined by its inner end edge 39, which is cut off at right angles to the central fold 19, and short side edges 41 parallel to the central fold 19. The corners of the nose 37 are relieved by cutting them off at an angle of 45° as indicated at 43.

The sleeve has a longitudinal slit 45 extending in outward direction from its inner end to a point spaced inward from the inner end 23 of the valve flap 9. The slit is located centrally in respect to the width of the sleeve in the line of the fold 19. It is preferably made with its sides divergent toward the inner end of the sleeve so as to widen toward the inner end of the sleeve. The corners at the end of the slit are relieved by cutting them off at an angle of 135° to the inner end of edge 39 as shown at 47. The slit 45 constitutes an opening for flow of material from the filling spout

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into the bag in a lateral (downward) direction with respect to the length of the sleeve. It is made of sufficient length so that the inner end of the sleeve may open up wide to allow for free flow of material from the spout so as to avoid clogging.

In accordance with this invention, the sleeve is provided with a flexible paper flap 49 constituting the check valve member adapted to permit flow of material through the slit 45 during the filling of the bag and adapted to close back upon the slit when the bag has been filled. As shown, this flap 49 consists of a rectangular piece of paper having a length greater than the length of the slit and less than the distance from the inner end of the sleeve to the inner end 23 of the valve flap. It is secured by adhesive (paste) as indicated at 51 to that surface of the sleeve which is on the outside of the sleeve in the folded condition of the sleeve on one side of the slit 45. The flap 49, as secured to the sleeve, projects laterally with respect to the length of the sleeve from the portion of the sleeve on the stated side of the slit in the direction away from the closure 13 (downward as viewed in Figs. 1-3). The flap 49 extends from a point between the inner end 23 of the valve flap 9 and the outer end 53 of the slit 45 to the inner end of the sleeve. With the sleeve in its flat unfolded condition as illustrated in Fig. 4, the flap 49 extends completely across the slit 45 to overlie the portion of the sleeve on the other side of the slit. The flap 49 is also adapted to overlie this portion of the sleeve when the sleeve becomes flattened on filling the bag (see Fig. 5).

The bag is filled with finely divided or pulverized material by entering a filling spout (not shown) into the valve flap 9 and blowing the material through the spout into the bag. The material flows freely into the bag through the sleeve 11 in the direction of the length of the sleeve and also in a lateral direction through the slit 45. The flap or check valve member 49 does not impose any perceptible obstruction to flow of material into the bag. As the bag is filled, the sleeve flattens out in the manner illustrated in Fig. 5. When the bag is completely filled, the flow of material is cut off and the bag is taken off the spout. The flattened sleeve is pressed closed by the contents of the bag. The flap 49 is pressed closed against the sleeve effectively to block the slit and prevent escape of material through the slit. The provision of the flap 49 makes possible the use of a relatively long slit to ensure free flow of material into the bag while avoiding the possibility of leakage through such a slit as may occur without the flap. It will be observed that there is full overlap of the flap throughout the length of the slit.

While the sleeve 11 as described above is constituted by a separate piece of paper adhered to the bag proper, it is contemplated that it may be constituted by an integral extension of one of the plies of the bag, preferably the inner ply. It is also contemplated that the sleeve may have slits in its sides in addition to the central slit 45, with flaps like the flap 49 for each such side slit.

Figs. 6-8 illustrate the principles of the invention applied to a multi-ply paper pasted closure valve bag, which is generally designated 61. As will be understood by those skilled in the art, such bags are usually made by segmenting a continuous length of bag tubing into individual bag tubes, and providing each such tube with a pasted closure at each end, for example, a diamond fold type of closure. At the valve end of the bag, as shown in Figs. 6-8, the closure comprises side flaps 63 and 65 and inwardly directed end flaps. Only the end flap at the valve corner of the bag is shown. This is designated 67. In forming the closure, the side flap 63 is folded over upon a transverse fold line 69 to overlie the end flaps, and the side flap 65 is folded over upon a transverse fold line 71 to overlap the flap 63. The flap 63 is pasted to the end flap at the other end

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of the closure from end flap 67, but is not pasted to flap 67. The flap 65 is pasted to flap 63.

In accordance with this invention, the end flap 67 is provided with a flexible extension 73. As illustrated, this extension is constituted by a rectangular piece of paper secured by adhesive (paste) as indicated at 75 to the end flap 67 and projecting inward from the inner end 77 of the end flap. The width of the extension (its dimension crosswise of the end flap) corresponds to the width of the inner end portion of the end flap (see Fig. 6).

The extension 73 has a central longitudinal slit 79 extending from its inner end to a point spaced inward from the inner end 77 of the end flap 67. The extension is provided with a flexible paper flap 81 constituting a check valve member adapted to permit flow of material through the slit 79 during the filling of the bag and adapted to close back upon the slit when the bag has been filled. As shown, this flap 81 consists of a rectangular piece of paper having a length greater than the length of the slit and less than the distance from the inner end of the extension to the inner end 77 of the end flap 67. It is secured by adhesive (paste) as indicated at 83 to that surface of the extension which faces inward (away from the closure) on one side of the slit. The flap 81, as secured to the sleeve, projects laterally with respect to the length of the extension 73 from the portion of the extension on the stated side of the slit and overlies the portion of the extension on the other side of the slit. It extends from a point between the inner end 77 of the end flap 67 and the outer end 85 of the slit to the inner end of the extension, and acts in the same manner as the flap 49 shown in Figs. 1-5. It will be understood that the extension 73 may be provided as an integral extension of one of the bag plies, rather than as a separate piece of paper.

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.

I claim:

1. A bag having a valve flap at one of its corners at one end, the bag having a closure at said end, the valve flap having a central fold spaced from the closure, a flexible sleeve projecting inward from the valve flap, said sleeve being folded in half on a central fold in line with the central fold of the valve flap, said sleeve having a central longitudinal slit extending from its inner end to a point spaced inward from the inner end of the valve flap, and said sleeve having a flexible flap secured thereto at one side of the slit for covering the slit, said covering flap projecting laterally with respect to the length of the sleeve from the portion of the sleeve on said one side of the slit in the direction away from the closure and adapted to overlie the outside of the portion of the sleeve on the other side of the slit when the sleeve becomes flattened upon filling the bag, said covering flap extending from a point between the inner end of the valve flap and the outer end of the slit toward the inner end of the sleeve.

2. A multi-ply paper bag having a valve flap at one of its corners at one end, the bag having a closure at said end, the valve flap having a central fold spaced from the closure, a flexible single-ply paper sleeve projecting inward from the valve flap, said sleeve being folded in half on a central fold in line with the central fold of the valve flap, said sleeve having a central longitudinal slit extending from its inner end to a point spaced inward

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from the inner end of the valve flap, and said sleeve having a flexible paper flap adhered to the outside thereof at one side of the slit for covering the slit, said covering flap projecting laterally with respect to the length of the sleeve from the portion of the sleeve on said one side of the slit in the direction away from the closure and adapted to overlie the outside of the portion of the sleeve on the other side of the slit when the sleeve becomes flattened upon filling the bag, said covering flap extending from a point between the inner end of the valve flap and the outer end of the slit to the inner end of the sleeve.

3. A paper bag having a pasted closure at one end and provided with a valve at one corner at said end, said valve comprising an inwardly directed end flap portion of said pasted closure and a flexible extension projecting inward from said end flap, said extension having a longitudinal slit extending from its inner end to a point spaced inward from the inner end of said end flap, and said extension having a flexible flap secured thereto at one side of the slit for covering the slit, said covering flap projecting laterally with respect to the length of the extension from the portion of the extension on said one side of the slit and overlying the portion of the extension on the other side of the slit on that surface of the extension which faces away from the closure, said covering flap extending from a point between the inner end of said end flap and the outer end of the slit toward the inner end of the extension.

4. A multi-ply paper bag having a pasted closure at one end and provided with a valve at one corner at said end, said valve comprising an inwardly directed end flap portion of said pasted closure and a flexible single-ply paper extension projecting inward from said end flap, said extension having a central longitudinal slit extending from its inner end to a point spaced inward from the inner end of said end flap, and said extension having a flexible paper flap for covering the slit adhered to that surface of the extension which faces away from the closure at one side of the slit, said covering flap projecting laterally with respect to the length of the extension from the portion of the extension on said one side of the slit and overlying the portion of the extension on the other side of the slit on said surface of the extension, said covering flap extending from a point between the inner end of said end flap and the outer end of the slit to the inner end of the extension.

5. A multi-ply paper bag having a valve formation at one of its corners at one end adapted to receive a filling spout, the bag having a closure at said end, said valve formation including a valve flap consisting of an intumed integral corner portion of the bag which includes all the plies of the bag, and a flexible single-ply paper valve flap extension projecting inward into the bag from the valve flap, the total width of said extension at the inner end edge of the valve flap corresponding to the total width of the valve flap at its said inner end edge, said single-ply extension having a central longitudinal slit extending in outward direction from the inner end of the extension for a substantial distance to allow for flow of material from the spout in a lateral direction with respect to the length of the extension, said single-ply extension having a flexible paper flap secured thereto along one side of the slit only adapted to act as a check valve for permitting the lateral flow of material through the slit during the filling of the bag and to close back over the slit when the bag has been filled, said flexible paper flap projecting laterally with respect to the length of the extension from the portion of the extension on one side of the slit and being wider than the slit so that it is adapted to extend completely across the slit and overlie the outside of the portion of the extension on the other side of the slit when the extension is in a substantially flat condition thereby to block the slit, said paper flap extending lengthwise of the extension in the region thereof between the

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outer end of the slit and the inner end of the extension.

6. A bag having a valve flap at one of its corners at one end, the bag having a closure at said end, the valve flap having a central fold spaced from the closure, a flexible sleeve projecting inward from the valve flap, said sleeve being folded in half on a central fold in line with the central fold of the valve flap, said sleeve having a central longitudinal slit coincident with its said central fold extending in outward direction from its inner end for a substantial distance, and said sleeve having a flexible flap secured thereto along one side of the slit only for covering the slit, said covering flap projecting laterally with respect to the length of the sleeve from the portion of the sleeve on said one side of the slit in the direction away from the closure and adapted to overlie the outside of the portion of the sleeve on the other side of the slit when the sleeve becomes flattened upon filling the bag, said covering flap extending in the region of the sleeve between the outer end of the slit and the inner end of the sleeve.

7. A multi-ply paper bag having a valve formation at one of its corners at one end adapted to receive a filling spout, the bag having a line of stitching closing said end, said valve formation including a valve flap consisting of an intumed integral corner portion of the bag which includes all of the plies of the bag, the valve flap having a central fold spaced from the line of stitching, a flexible paper sleeve having a base portion inserted between the plies of the valve flap, said base portion having a total width corresponding to the total width of the inner end edge of the valve flap, said sleeve projecting inward from the valve flap and being folded in half on a central fold in line with the central fold of the valve flap, the lateral margins of the sleeve being caught in the stitching, said sleeve having a central longitudinal slit coincident with its said central fold extending in outward direction from its inner end for a substantial distance, and said sleeve having a flexible paper flap secured thereto along one side of the slit only for covering the slit, said covering flap projecting laterally with respect to the length of the sleeve from the portion of the sleeve on said one side of the slit in the direction away from the line of stitching and adapted to overlie the outside of the portion of the sleeve on the other side of the slit when the sleeve becomes flattened upon filling the bag, said covering flap extending in the region of the sleeve between the outer end of the slit and the inner end of the sleeve.

8. A paper bag having a pasted closure at one end and provided with a valve at one corner at said end, said valve comprising an inwardly directed end flap portion of said pasted closure and a flexible extension projecting inward from said end flap, said extension having a longitudinal slit extending in outward direction from its inner end of a substantial distance, and said extension having a flexible flap secured thereto along one side of the slit only for covering the slit, said covering flap projecting laterally with respect to the length of the extension from the portion of the extension on said one side of the slit and overlying the portion of the extension on the other side of the slit on that surface of the extension which faces away from the closure, said covering flap extending in the region of the sleeve between the outer end of the slit and the inner end of the extension.

9. A multi-ply paper bag having a pasted closure at one end and provided with a valve formation at one corner at said end adapted to receive a filling spout, said valve formation comprising an inwardly directed end flap portion of said pasted closure which includes all of the plies of the bag, a flexible single-ply paper extension having a base portion secured to the outer face of said end flap and projecting inward from said end flap, said base portion having a total width corresponding to the total width of the inner end edge of said end flap, said extension having a central longitudinal slit

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extending in outward direction from its inner end for a substantial distance, and said extension having a flexible flap secured to the inner face thereof along one side of the slit only for covering the slit, said covering flap projecting laterally with respect to the length of the extension from the portion of the extension on said one side of the slit and overlying the portion of the extension on the other side of the slit on the inner face of the extension, said covering flap extending in the region of the sleeve between the outer end of the slit and the inner end of the extension.

10. A bag having a valve flap at one of its corners at one end, the bag having a closure at said end, the valve flap having a central fold spaced from the closure, a flexible sleeve projecting inward from the valve flap, said sleeve being folded in half on a central fold in line with the central fold of the valve flap, said sleeve having a central longitudinal slit coincident with its said central fold extending in outward direction from its inner end for a substantial distance, one of the halves of the sleeve including as a part thereof a flexible flap extending along one side of the slit only for covering the slit, said covering flap projecting laterally with respect to the length of the sleeve from the portion of the sleeve on said one side of the slit in the direction away from the closure and adapted to overlie the outside of the portion of the sleeve on the other side of the slit when the sleeve becomes flattened upon filling the bag, said covering flap extending in the region of the sleeve between the outer end of the slit and the inner end of the sleeve.

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11. A paper bag having a pasted closure at one end and provided with a valve at one corner at said end, said valve comprising an inwardly directed end flap portion of said pasted closure and a flexible extension projecting inward from said end flap, said extension having a longitudinal slit extending in outward direction from its inner end for a substantial distance, the portion of said extension at one side of the slit including as a part thereof a flexible flap extending along one side of the slit only for covering the slit, said covering flap projecting laterally with respect to the length of the extension from the portion of the extension on said one side of the slit and overlying the portion of the extension on the other side of the slit on that surface of the extension which faces away from the closure, said covering flap extending in the region of the sleeve between the outer end of the slit and the inner end of the extension.

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