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T. A. CONTRYMAN

2,378,285

BAG VALVE

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FIG. 1.

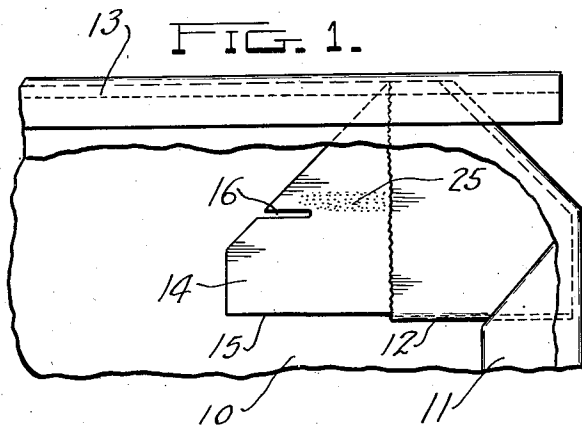


FIG. 2.

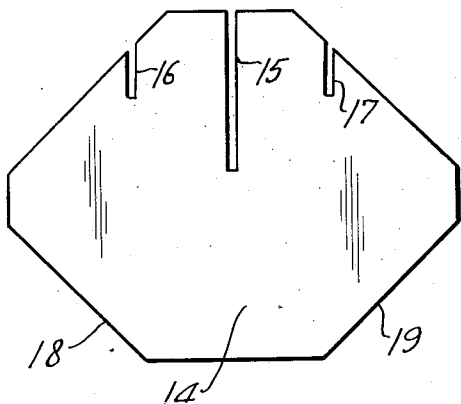


FIG. 3.

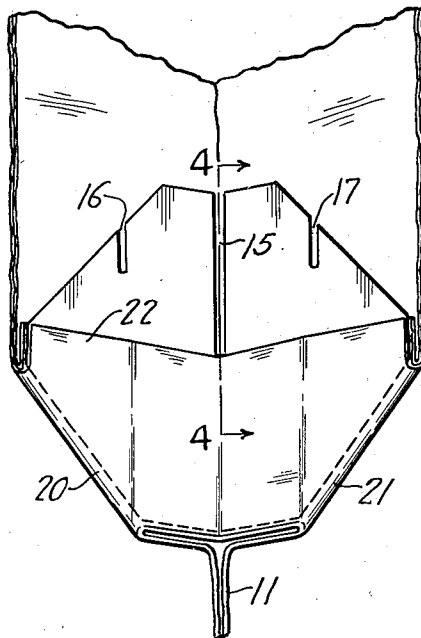
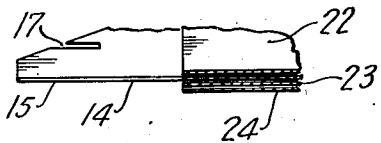


FIG. 4.



Theron A. Contryman

INVENTOR

BY *Owen & Owen*

ATTORNEYS

UNITED STATES PATENT OFFICE

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BAG VALVE

Theron A. Contryman, Oswego, N. Y., assignor to
St. Regis Paper Company, New York, N. Y., a
corporation of New York

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4 Claims. (Cl. 229—62.5)

This invention relates to a valve bag, and has for its object to provide a bag with an improved valve. One of the objects is to provide a valve flap with slots in its edge which facilitate proper folding of the valve edge to make a tight closure. Another object is to provide an extension of the valve edge so as to make a more complete closure. Another object is to provide a method by which such extension can be readily and economically positioned in the valve and placed in correct relation to the other portions of the bag. Another object is to secure portions of the valve to the bag walls so as to facilitate folding of the valve along desired lines.

While some features of the invention are capable of wide application, the invention is primarily directed to an improvement in multi-ply valve bags formed of paper or the like and intended for heavy duty. Further details and objects of the invention will appear as the description proceeds.

In the accompanying drawing forming a part of this specification,

Figure 1 is a view of the valve corner of a bag, with parts broken away to show the construction of the valve and its position in an empty bag;

Fig. 2 is a plan view of the supplemental sheet which is employed to form a valve extension;

Fig. 3 is a somewhat diagrammatic view illustrating the manner in which the supplemental sheet is inserted in the bag;

Fig. 4 is a detail section on the line 4—4 of Fig. 3.

In the embodiment of the invention disclosed in the drawing, there is shown a bag 10 having a gusseted side 11, with a valve 12 folded in at the corner of the bag and at the end of the gusset. The end of the bag shown is closed by a reinforced seam 13.

In addition to the walls of the bag which are turned in to form a valve, there is shown a supplemental sheet 14 which constitutes a valve extension. This supplemental sheet is provided with a slot 15 along the front end of its bottom fold line, and with parallel slots 16 and 17 in its sides slightly below the middle of the sides.

This supplemental sheet may be attached to the folded-in corner of the bag in any suitable manner, but the preferred method is merely to slip it in between the plies of the inturned corner while the end of the bag is spread apart and the corner folded over, in the usual manner employed as the first step in bottoming a paper bag, as shown in Fig. 3. The rear edge of the supplemental sheet may be cut off at 18 and 19 so

that it will fit against slanting folds 20 and 21 of the bag. It can then be readily slipped in under external ply 22 of the valve corner and above plies 23 and 24, or, if preferred, it may be slipped in between plies 23 and 24. The shape of the rear edge of the supplemental sheet is such that it is accurately positioned by contact with its rear edge with the fold lines, so that it may be easily and quickly placed in position with sufficient accuracy. When the opened out sides of the bag are again brought together preparatory to forming the seam, the friction between the supplemental sheet and the plies of paper between which it is placed is sufficient to insure its remaining in proper position, and when the seam is formed the edge of the supplemental sheet is caught in this seam, in the form shown. However, there is little danger of the supplemental sheet becoming displaced even if it is not caught in the seam.

It will be readily understood that, when the bag is filled, a filling spout is inserted through the valve opening and spreads apart the sides of the valve and supplemental sheet between its lower edge and the seam. After the filling tube is withdrawn, the material in the bag presses the valve flap towards the seam. It is preferable to construct the valve so that the sides will spread apart along fold lines substantially half way between the bottom of the valve and the seam. Thereupon the lower portion of the flap folds upward and lies flatly against the upper portion of the flap. However, the bag seldom opens out so that the sides spread to form an end at right angles to the sides, but usually form a reverse curve between the seam and vertical sides. It is preferable to have the lower lip of the valve, at one time during the closing of the valve, form a chord across the arc of the upper side of the valve which lies against the walls at the end of the bag. Thereafter continuing pressure of material against this chord folds it upwards against the end of the bag.

It will be seen that in the changing of the shape of the valve from that shown in Fig. 1 to that in which the valve is finally closed, the fold along the bottom of the valve is straightened, while folds are formed in the two sides substantially half way between the top and the bottom, but preferably slightly below the half-way line. In the construction shown, slots 15, 16 and 17 are along these fold lines, and facilitate the folding of the paper along these lines so as to obtain the desired action of the valve. Slots 16 and 17 are preferably so spaced as to obtain the chord-

like relation of the bottom of the valve to the top thereof during the closing movement, as described above. If slots 16 and 17 are too far apart, the lower half of the valve flap cannot pass upward to its closed position without crumpling. Arrangement of the slots as described minimizes the danger of irregular crumpling of the valve edge, which might result in forming channels through which the contents of the bag could escape.

In the closing of the valve, even with the paper weakened along the preferred fold lines, there is danger of some irregularity in operation. Where the paper is merely cut along lines 15, 16 and 17, the edges sometimes abut and cause crumpling. In the construction shown, there are slots of appreciable width formed along these lines. In practice these slots may be made somewhat less in width than shown in the drawings where they are exaggerated somewhat for purposes of illustration. With slots of the form shown, a tapered or slanting closure of the valve lip will ordinarily result in overlapping of the edges of the supplemental sheet along these slots without abutting or causing crumpling. This result may be accomplished by acute V-shaped cuts instead of the slots shaped as shown in the drawings, but the shape of slots illustrated is convenient to manufacture and operates satisfactorily.

As previously indicated, the preferred construction is to have slots 16 and 17 slightly lower than half-way between the bottom of the valve and closing seam, when the valve is collapsed as shown in Fig. 1. As indicated above, this may be conveniently arranged so that the lower portion between slots 16 and 17 will form a chord across the arc of the upper portion between those slots and the seam, but in the final closing of the valve this chord should be pressed up against the over-lying arc. In order to do this, the fold lines at the edge are changed somewhat. The slots facilitate this operation. For example, the paper may start to bend along the bottom of the slot, and then pull up in the final closing operation so that the final fold lines are at the tops of the slots.

It will be readily understood that the arrangement of slots at the edge of the valve is advantageous regardless of whether the valve is produced by an integral extension on the bag wall or by supplemental sheets applied in other ways than that illustrated. Also it will be readily understood that a supplemental sheet with a projecting valve edge of different shape might be positioned within the valve corner in the manner described above. However, the preferred construction is the one shown, and it will be readily seen that the application of such a sheet to the corner is not only facilitated by the shape of the rear edge of the sheet, but that the shape of the front edge also facilitates ascertaining the proper position of the sheet. However, it would not be necessary in all cases to extend the sheet back as far as indicated.

Also, while the construction is illustrated in connection with a bag having a gusset fold, it will be readily understood that a similar arrangement could be employed with a bag which would not have this gusset fold, the change being an obvious one. Furthermore, while the construction, and particularly the shaping and slotting of the valve edge of the supplemental sheet, is particularly advantageous in a bag closed by a sewn seam and where the valve is normally collapsed in the manner illustrated in Fig. 1, it will

be readily understood that a supplemental valve sheet may be placed in position in a bag corner, as illustrated in Fig. 3, and then the edges of the bag folded over each other and pasted together in the usual manner for forming a pasted-end bag, if desired.

Also, if desired, adhesive may be applied to the under side of the supplemental sheet, as indicated at 25 in Fig. 1, so that the projecting edge of the supplemental sheet is adhered to the bag walls at and above the side fold lines. This aids in the proper movement of the valve flap during the closing of the valve, since it forces a spreading apart of the valve sides along with the bag walls to first straighten out the lower flap of the valve, whereafter the lower flap is forced by the contents of the bag to lie smoothly against the upper flap and bag end. This securing of the edge of the valve flap to the bag wall may be achieved with sheets of different, or even with tabs merely large enough to accomplish this result without effecting an extension of the valve-closing valve flap, and therefore this constitutes another feature of the invention.

Instead of depending upon friction to hold the supplemental sheet in place, adhesive or other means may be employed to secure the supplemental sheet to the original bag walls, and some of the advantages of the supplemental sheet described may be retained where the sheet is merely placed upon and adhered to the corner of the bag while it is spread as shown in Fig. 3, instead of being inserted between the plies.

The preferred embodiment of the invention has been disclosed in detail and some variations have been described, but it will be understood that other changes may be made within the scope of the appended claims.

What I claim is:

1. A bag having one corner turned in to form a valve and a supplementary sheet extending inward from said inturned corner, said sheet being normally folded along one line when the bag is empty and being folded along different lines to close the valve opening after the bag is filled, the edge of the sheet being provided with a slit along each of said lines and being unslit between said lines, and the sheet being attached to the bag walls beyond the inturned corner and adjacent the slits along which the valve is folded after the bag is filled.

2. The method of making a valve in a multiply paper bag which comprises spreading apart the sides of the bag tube at an open end and thereby flattening the corner of the bag, slipping in between the plies of the flattened corner a single ply supplemental sheet having one end cut to completely fit the outline of the flattened corner and positioning the sheet so its said end contacts the fold at the edge of the flattened corner throughout the length of that fold and its other end extends beyond the bag wall at said flattened corner to form a single ply extension, the sheet being free from adhesive between the plies of the wall at said flattened corner, folding inward the flattened corner and supplemental sheet along a median line, and bringing said sides together and forming an end closure across the end of the bag tube, leaving open a valve opening where the corner and sheet are folded in.

3. A method of making a valve bag which comprises spreading apart the sides of a multiply bag tube and flattening one corner of the tube, slipping a supplementary sheet between the plies of the flattened corner, adhering the supplemental

sheet to the bag wall beyond but near the edge of the corner and adjacent a line where it is desired that the valve shall fold after the bag has been filled, while leaving said sheet unadhered to the flattened corner across the central longitudinal line of the corner, and thereafter bringing said sides together and forming an end closure for the bag.

4. A method of making a valve bag which comprises spreading apart the sides of a multiply bag 10

5 tube and flattening the corner of the tube, slipping a supplementary sheet between the plies of the flattened corner, adhering the supplemental sheet to a ply of the corner and to the inner side of the bag wall at the edge of the corner and adjacent a line where it is desired that the valve shall fold after the bag has been filled and thereafter bringing said sides together and forming an end closure for the bag.

THERON A. CONTRYMAN.