Jan. 4, 1944. B. T. MILLER 2,338,254

VALVE BAG

Filed Nov. 23, 1940

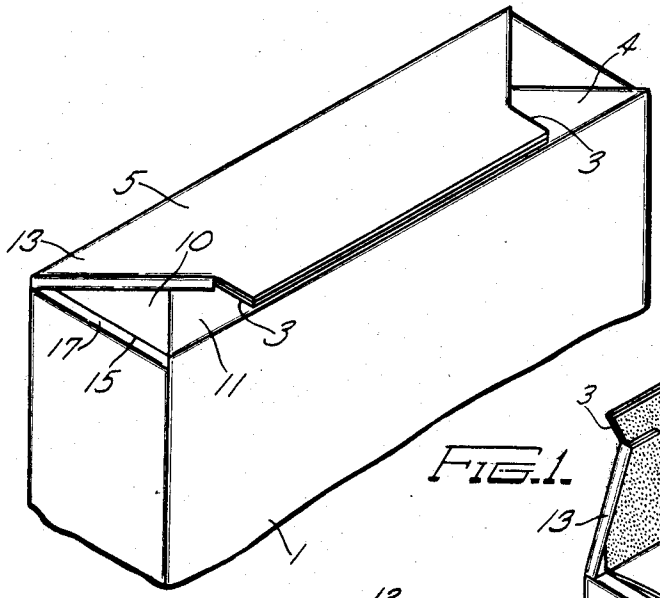


FIG. 1.

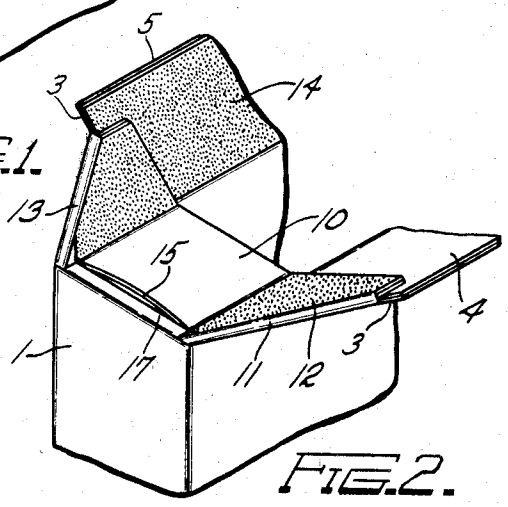


FIG. 2.

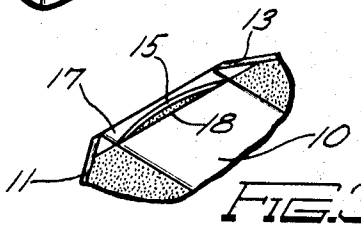


FIG. 3.

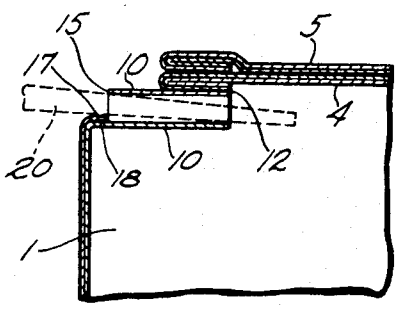


FIG. 4.

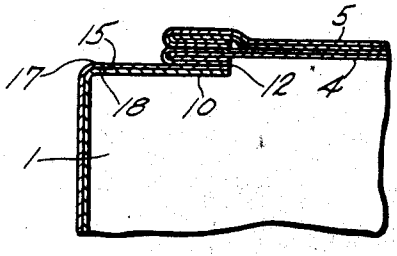


FIG. 5.

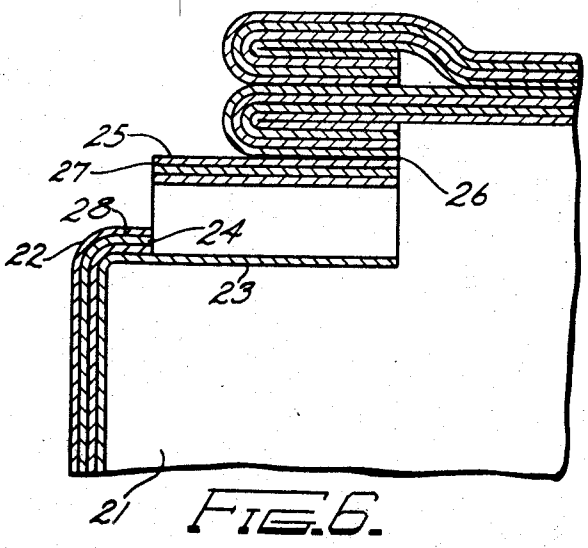


FIG. 6.

Inventor

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UNITED STATES PATENT OFFICE

2,338,254

VALVE BAG

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Application November 23, 1940, Serial No. 366,800

5 Claims. (Cl. 229—62.5)

This invention relates to valve bags, and particularly to valve bags where the inlet opening is securely closed after filling so that there will be no leakage through the valve.

This application is a continuation in part of my prior application No. 257,614, filed February 21, 1939.

The primary object of the invention is to provide a bag having walls comprising a plurality of plies or layers of paper and having an ordinary form of valve flap formed from the so-called "diamond fold" wherein the angularly shaped opposite ends of the bag end flaps combine with the triangularly shaped outer end of the valve flap to form a diamond shape when the bag is empty and collapsed.

The distinguishing feature of the invention is the provision of a transverse slit through one or more plies of the valve flap through which the filling tube may be inserted, the slit being located in the usual valve flap and the filling tube being inserted between the plies of paper comprising the bag. This slit feature lengthens the closure of the valve and increases the protection against leakage of the contents through the valve, and, at the same time, does not sacrifice any of the advantages of the diamond fold construction.

An understanding of the construction and function of the subject matter of the instant invention will be secured after a study of the following specification and the accompanying drawing, in which—

Figure 1 is a fragmentary perspective view of the valve end of a paper bag formed in accordance with the present invention;

Figure 2 is a perspective and fragmentary view of the valve corner of a bag illustrating one step in the method of forming the leakproof valve;

Figure 3 is a perspective and fragmentary view of a portion of the valve showing the slitted valve flap in detail;

Figure 4 is a vertical sectional view of the valve construction, a filling tube being shown in dotted lines;

Figure 5 is a view similar to that shown in Figure 4, but with the filling tube removed and the valve occupying sealed relation, and

Figure 6 is a view similar to Figure 4, but showing a four ply bag with a slit through three of the plies.

Referring to said drawing, the reference numeral 1 designates a tubular paper bag, of multiwall construction, being composed of two or more layers of paper, the bag shown in the drawing having two plies, the thickness of the plies being exaggerated throughout the drawing for clearer illustration.

In the formation of the valve construction forming the subject matter of the instant invention, the tube or bag end is preferably longitudinally cut a short distance at a short spaced distance from its edges, as shown at 3, and is spread open and folded to form opposite end flaps 4 and 5 and a corner valve flap 10 to form a valve of the common diamond fold. The end flap 4 is folded down and its triangular portion 11 (formed from an integral extension of the valve flap 10) is pasted to the upper surface of the valve flap 10 by means of the adhesive 12. The opposite end flap 5 is then folded down upon the end flap 4, as is its triangular portion 13 (formed from an integral extension of the valve flap 10) and the two end flaps 4 and 5 are pasted together by means of adhesive 14 to effect the bag closure.

So formed, it will be observed that the usual valve opening between the valve flap 10 and the end closure 4 is closed by reason of the adhesive 12. However, a valve opening is provided at a spaced distance outwardly of the usual valve opening by the provision of a transversely extending slit 15 provided in the outer ply of paper of the valve flap 10, the slit 15 being so spaced from the outer edge of the bag as to leave a lip 17 intermediate the slit 15 and the outer edge of the bag. As shown in Fig. 3, the lip 17 is pasted to the inner ply of paper of the valve flap by interply adhesive 18.

When it is desired to fill the bag 1, the end of the filling tube 20 attached to the filling apparatus is introduced in the slit so that it will extend interiorly of the bag over the lip 17 and between the two layers or plies of paper from which the valve flap 10 is formed, as shown in Fig. 4. After the bag has been filled, the bag is removed from the filling tube and the two separated plies of paper of the valve flap 10 collapse and return to abutting relation so that the valve flap 10 occupies the same horizontal plane as the lip 17, as shown in Fig. 5, thereby effectually sealing the valve against leakage.

As previously stated, the general valve flap and bag construction here involved is substantially the same as valve bags now in common use equipped with the diamond fold. In the latter construction, however, the filler tube is inserted into the bag between the valve flap 10 and the end closure flaps 4 and 5. Such a construction is objectionable because the valve flap is of such

short length that it will not effectually prevent leakage of contents therethrough. However, in the instant construction the provision of the slit 15 in the upper ply of paper of the valve flap at a spaced distance outwardly of the usual valve opening materially lengthens the flap closure and increases the area of protection against leakage. Additionally, it will be noted that the filler tube is introduced into the bag between the side wall plies of the multi-wall bag, and this is desirable because such a construction serves as a baffle to discourage leakage of contents. Slit 15 must, of course, be located so that the filling tube can be inserted therethrough outside of the side flaps.

Moreover, separation of the two plies of paper of the valve flap 10 and the absence of inter-ply adhesive therebetween lends flexibility to the flap, a characteristic desirable to resist any sifting of the contents outwardly through the valve.

However, since there is ordinarily a tendency to tear the upper ply of the valve flap above the filling tube and outside of the side flaps, it is advisable to have the slit through a sufficient portion of the bag wall so as to provide strength at this point, preferably at least one-half the strength of the wall. For three or more plies this will ordinarily require a slit through a plurality of plies, in which case the slits through the several plies should substantially register so as to avoid tearing the ply that would otherwise extend outward the most above the filling tube. If the outer ply is exceptionally strong, it may constitute one-half the strength of a bag having three or more plies. Conversely, if the outer ply is employed more for ornamental purposes, it is more necessary to have the slit through one or more of the strong inner plies.

Figure 6 illustrates the invention applied to a four ply bag, with the three outer plies being slit. The four ply bag 21 is made in the same way as bag 10 except for the number of plies. The wall is bent at 22 to provide a valve flap 23 consisting of the inner ply, while the three outer plies are slit at 24 to form an extension 25 of the overlying side flaps to which the extension is adhered by adhesive 26, similar to adhesive 12. In order that the three upper plies may be raised as a unit, it is preferable to connect them at some point, adhesive 27 being indicated for this purpose, while at the other side of slit 24 there is shown adhesive 28, similar to adhesive 18 shown in Fig. 3.

Although I have illustrated a preferred embodiment of the invention it will be apparent that various changes and alterations might be made in the general form and arrangement of elements described without departing from the invention, attention being given to the purposes of the invention as indicated above. Hence, it is not intended to be limited to the precise details set forth, and I shall consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of the appended claims.

What I claim is:

1. A bag having walls comprising a plurality of plies of paper and having an end closure comprising end flaps of oppositely infolded portions of the bag wall and side flaps of oppositely infolded portions of the bag wall overlying the end flaps, and adhesive uniting all of said flaps, one of said end flaps having a transverse slit through its outer portion beyond the overlying side flaps and through at least substantially half its strength.

2. A bag having walls comprising a plurality of plies of paper and having an end closure comprising end flaps of oppositely infolded portions of the bag wall and side flaps of oppositely infolded portions of the bag wall overlying the end flaps, and adhesive uniting all of said flaps, one of said end flaps having a transverse slit through a plurality of plies beyond the overlying side flaps.

3. A bag having walls comprising a plurality of plies of paper and having an end closure comprising end flaps of oppositely infolded portions of the bag wall and side flaps of oppositely infolded portions of the bag wall overlying the end flaps, and adhesive uniting all of said flaps, one of said end flaps having substantially registering transverse slits through a plurality of outer plies beyond the overlying side flaps.

4. A bag having walls comprising a plurality of plies of paper and having an end closure comprising end flaps of oppositely infolded portions of the bag wall and side flaps of oppositely infolded portions of the bag wall overlying the end flaps, adhesive uniting all of said flaps, one of said end flaps having a transverse slit through a plurality of plies beyond the overlying side flaps, the slit plies being attached to each other on the side of the slit towards the side flaps.

5. A bag having walls comprising a plurality of plies of paper and having an end closure comprising end flaps of oppositely infolded portions of the bag wall and side flaps of oppositely infolded portions of the bag wall overlying the end flaps, and adhesive uniting all of said flaps, one of said end flaps having a transverse slit through its outer portion beyond the overlying side flaps and through at least substantially half its strength, and means attaching the outer plies outside of the slit to the unslit inner portion of the bag wall.

BERNARD T. MILLER.