Dec. 21, 1937. A. DU BOIS 2,102,685

VALVE CLOSED BAG

Filed Feb. 9, 1934 2 Sheets-Sheet 1

Fig. 1

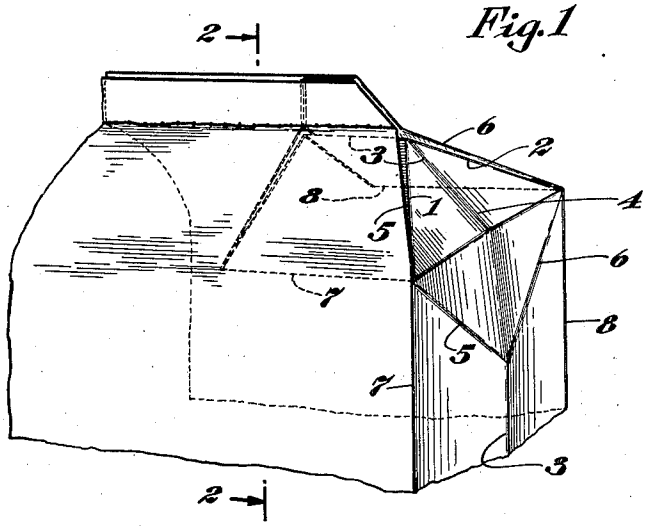


Fig. 3

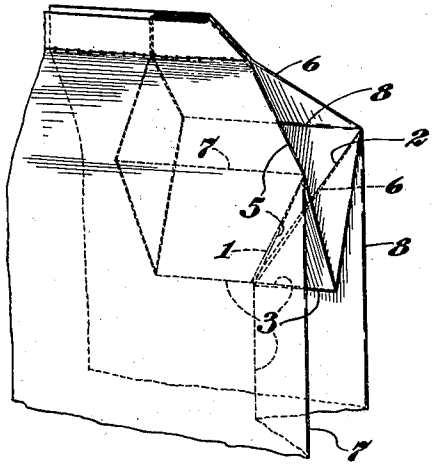


Fig. 2

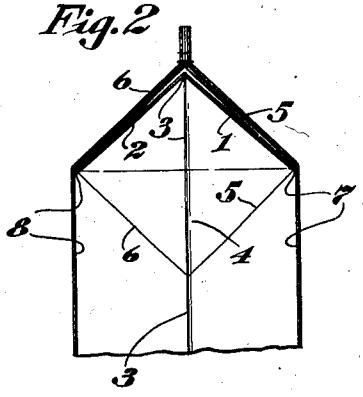
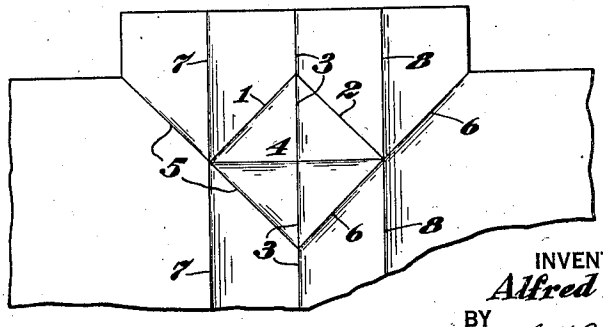


Fig. 4



INVENTOR
Alfred Du Bois,
BY
Bartlett Eyre Scott & Heal,
ATTORNEYS

Dec. 21, 1937. A. DU BOIS 2,102,685

VALVE CLOSED BAG

Filed Feb. 9, 1934 2 Sheets-Sheet 2

Fig. 5

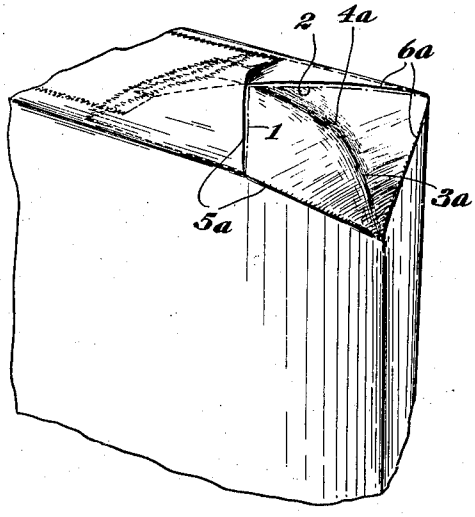


Fig. 6

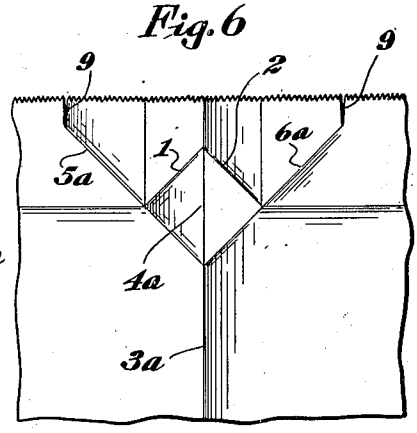


Fig. 7

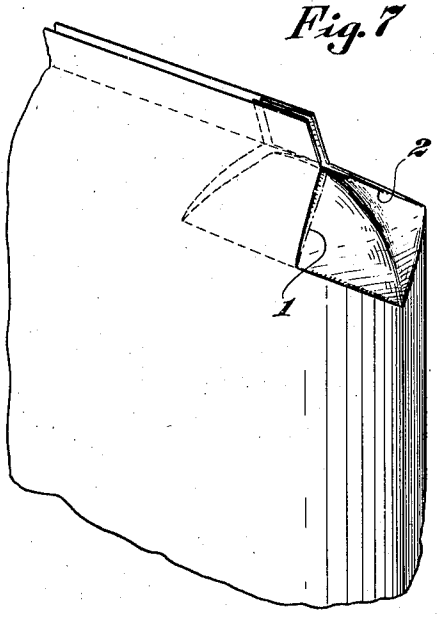
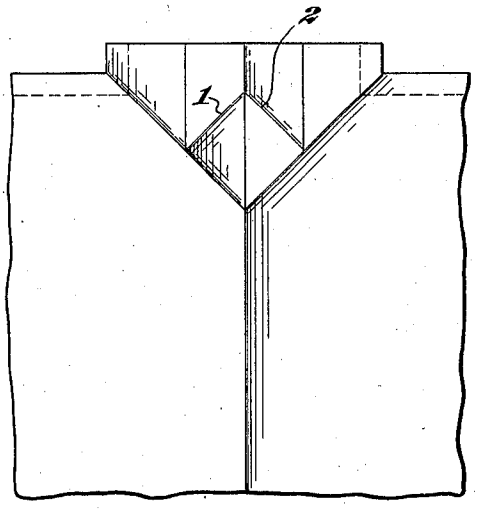


Fig. 8



INVENTOR
Alfred DuBois,
BY
Bartlett Eyre Scott & Keel,
ATTORNEYS

Patented Dec. 21, 1937

2,102,685

UNITED STATES PATENT OFFICE

2,102,685

VALVE-CLOSED BAG

Alfred Du Bois, Paris, France, assignor to Bartlett Arkell, New York, N. Y.

Application February 9, 1934, Serial No. 710,403
In Belgium May 5, 1933

9 Claims. (Cl. 229—62.5)

The present invention relates to valve bags, especially to valves of multi-wall paper bags, and its more particular purpose is to provide improved means for closing such bags so as to adapt them for the proper packaging of light products, such as flour, and talcum powder, as well as expensive materials and materials of delicate nature, such as certain chemical and food products. In bags for such material it is essential that the valves should tightly close in order to preclude dust and other foreign matter and to prevent loss and leakage.

The valve of filled bags of the character indicated is intended to be kept in closed condition by virtue of the pressure of the bag contents acting on the valve. The customary valves seldom close perfectly even where heavy materials such as cement are dealt with, for the reason that this pressure must overcome the stiffness of the paper so as to impart to the latter a form to cause the opposite walls of the valve to make close contact. With light materials, as there is less pressure exerted upon the valve closure, the valve is less likely to close effectively.

Valve equipped bags are filled by means of a tube which is inserted through the valve and into the interior of the bag. Where heavy materials are concerned such as cement, for example, which is made to run through the tube at a fairly high speed, a tube of from thirty to forty millimeters in diameter will in general be adequate in order to fill the usual fifty kilogram bag rapidly. Light materials, however, cannot be conveyed or run as speedily as heavy materials through the tube.

The principal object of the present invention is to overcome the difficulties of the prior valve bags above described, namely, to provide means to insure proper closing of the filled bag even where it contains light materials, and, furthermore, to cut down the time required for the packaging of such materials.

With this object in view, an important feature of the invention consists in the provision of a valve for a bag in which the under flap is suitably creased to provide hinged panel-like portions which when the bag is filled tend to cause the valve flap to be positioned in close fitting engagement with the overlying wall of the valve, the stiffness of the material from which the bag is made serving to maintain the closed position thereof. The construction is such that the closing of the valve is effected even under a slight thrust or pushing force imparted by the contents of the bag, and, moreover, once the valve is closed it is effectively maintained closed independently of the pressure exerted by the contents of the bag. The valve may if desired be easily sealed when in closed condition by applying adhesive between the engaging walls thereof.

In the accompanying drawings applications of the invention to various standard types of bag are illustrated.

Figure 1 is a diagrammatical perspective view of the valve end of a bellows type sewed bag embodying the invention with the valve shown substantially closed;

Fig. 2 is a section taken along the line 2—2 of Fig. 1;

Fig. 3 is a view similar to Fig. 1 with the valve shown in open position;

Fig. 4 is a plan view of a portion of the bag wall flattened down and showing the location of the various lines of creases of the valve portion of the bag;

Fig. 5 is a view similar to Fig. 1 of a portion of a bag having satchel or pasted ends;

Fig. 6 is a view similar to Fig. 4 of a portion of the wall of the bag of Fig. 5; and

Figs. 7 and 8 are views corresponding to Figs. 5 and 6 respectively but illustrating the application of the invention to sewn bags that are not provided with bellows or gussetted sides.

My improved valve is of the usual type that is formed by folding in one of the corners at the upper end of the bag as shown in Figs. 1 and 2 of the drawings. The under flap of the valve is provided with a crease 3 on the longitudinal center line thereof, which is a continuation of the apex of the bellows fold in the side wall of the bag. In addition to the crease 3, the valve portion of the bag is provided with the creases 7 and 8 that extend from the outer corners of the under flap of the valve to the inner edge thereof and arranged parallel with the crease 3. It is further provided with the diagonal creases 5 and 6.

In accordance with the present invention the portion of the wall of the bag constituting the under flap is provided with creases 1 and 2 which extend from the outer corners of the under flap to a point on the center line or crease 3 of the flap, and is spaced a distance from the inner edge of the flap corresponding to the distance from said inner edge to the center of the outer edge of the overlying wall of the valve.

With the provision of these additional creases 1 and 2, when the bag is filled and the filling tube is withdrawn, and the valve is acted upon by the pressure of the contents of the bag, it is

caused to assume the shape of a trihedron, comprising the faces or panels defined by the creases 1, 2, 3, 4, 7, and 8, the outer end portion of the crease 3 becoming convex as shown. Owing to the rigidity of the material of the wall of the bag, as the crease 3 is forced past its dead center the panels of this underlying flap tend to cause said flap to assume a convex form more or less independently of the pressure of the contents of the bag which ensures close fitting engagement between the underlying flap and the overlying wall of the valve, the creases serving as hinges to permit free relative movement of the panels. The end face of the trihedron completes the exterior wall of the bag so as to close the valve opening therein, and the lateral faces defined by the creases 1, 2, 3, 7, and 8 are laid closely against the overlying portions of the wall of the valve.

The pasted end of the bag shown in Fig. 5 is formed by folding over portions of the bag wall upon each other, with one of the end portions left unsecured to form the valve, and with the other portions secured together as customary. By providing the diagonal creases which extend to the longitudinal center line of the under flap, when the bag is closed the panel portions of the under flap defined by the creases 1 and 2, owing to the stiffness of the material of the bag tend to cause the inner longitudinal panels of the under flap to be pressed against the overlying wall of the valve. When the valve is closed the hinges between the panels formed by the creases 1 and 2 lie adjacent the inner angular portions of the usual creases 5^a and 6^a, with the diamond-shaped surface 4^a defined by the creases 1 and 2 and the lower portions of creases 5^a and 6^a forming the closure surface for the valve opening.

In the bag shown in Figs. 7 and 8 which has its end closed by a sewed seam, the creases 1 and 2 are arranged substantially the same as with the pasted end bag shown in Figs. 5 and 6, and the inner panels of the under flap are firmly positioned against the overlying portion of the upper wall of the valve.

As will be evident to those skilled in the art, my invention permits various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. A valve bag of the class described, comprising a flattened tube having its ends closed, and one corner thereof folded in to form a valve, with the under flap of the valve creased on lines extending diagonally from the outer corners of the flap to a point on the longitudinal center line of the flap spaced from the inner edge thereof so as to provide hinged portions which when the bag is filled tend to cause the valve flap to be positioned in close fitting engagement with the overlying wall of the valve.

2. A structure according to claim 1 in which the point of intersection of the diagonal creases with the longitudinal center line of the under flap of the valve is spaced a distance from the inner edge of the flap corresponding to the distance from said inner edge to the center of the outer edge of the overlying wall of the valve when the bag is filled and the valve is closed.

3. A valve bag of the class described comprising a flattened tube having its ends closed and one corner thereof folded in to form a valve with the end flap of the valve creased on lines extending diagonally from the outer corners of the flap to a point on the longitudinal center line of the flap spaced a distance from the inner edge of the flap corresponding to the distance of said inner edge to the center of the outer edge of the overlying wall of the valve when the bag is filled and the valve is closed, and further creased on lines extending from the outer corners to the inner edge of the flap and parallel with the longitudinal center line thereof so as to provide hinged portions which when the bag is filled tend to cause the valve flap to be positioned in close fitting engagement with the overlying wall of the valve.

4. A structure according to claim 3, in which the under flap of the valve is creased on the longitudinal center line thereof.

5. A valve bag of the class described, comprising a flattened tube having its edges at one end thereof secured together by a seam and having one corner of said end folded in to form a valve with the under flap of the valved creased on lines extending diagonally from the outer corners of the flap to a point on the center line of the flap spaced a distance from the inner edge thereof corresponding to the distance from said inner edge to the center of the outer edge of the overlying valve wall when the bag is filled, further creased on the longitudinal center line thereof, and further creased on lines extending from said corners to the inner edge of said flap and arranged parallel with the longitudinal center line of the valve so as to provide hinged portions which when the bag is filled tend to cause the valve flap to assume a convex form corresponding to the inner surface of the overlying wall of the flap and to be positioned in close fitting engagement with said surface.

6. A valve bag of the class described, comprising a flattened tube having gussetted sides, at least one end closed by a sewed seam, and one corner of said closed end folded in to form a valve, with the under flap of the valve creased on the longitudinal center line thereof, on lines extending diagonally from the outer corners of the flap to a point on said longitudinal center line spaced from the inner edge of the flap, and on lines extending from said outer corners to the inner edge of the flap and arranged parallel with said center line so as to provide hinged portions which when the bag is filled tend to cause the valve flap to assume a convex form conforming to the inner surface of the overlying wall of the valve and positioned in close fitting engagement therewith.

7. A valve bag of the class described, comprising a tube having an end closure formed by folding wall portions thereof upon each other, one of the under flaps being left unsecured to form a valve and the other portions secured together, with said valve flap creased on lines extending diagonally from the outer corners to a point on the longitudinal center line thereof so as to provide hinged portions which when the bag is filled tend to cause said valve flap to be positioned in close fitting engagement with the overlying wall of the valve.

8. A structure according to claim 7 in which said valve flap is further creased on lines extending from the outer corners to the inner edges thereof and parallel to the longitudinal center line of the flap.

9. A valve bag of the class described comprising a bag tube having a satchel end which has one of the under flaps left unsecured to form a valve, said valve flap being creased on lines extending from the outer corners of the flap to the inner edge of the flap and arranged substantially

parallel with the longitudinal center line of the flap, and further creased on lines extending diagonally from said corners inwardly to a point on the center line of the flap spaced a distance from the inner edge of the flap, whereby when the bag is filled and the valve is permitted to close the portion of said valve flap extending inwardly from said diagonal creases is caused to be positioned in close fitting engagement with the overlying wall of the valve.

ALFRED DU BOIS.