

Oct. 17, 1944.

F. G. ROBINSON

2,360,720

BLOCKBOTTOM CLOSURE FOR MULTIPLE PAPER BAGS OR SACKS

Filed Jan. 29, 1943

3 Sheets-Sheet 1

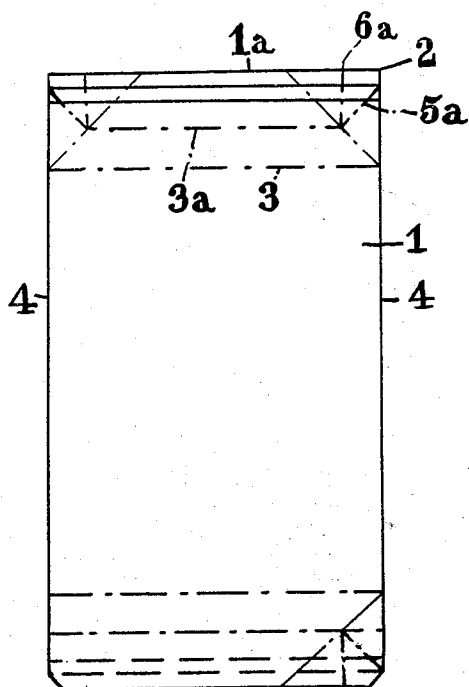


Fig. 1

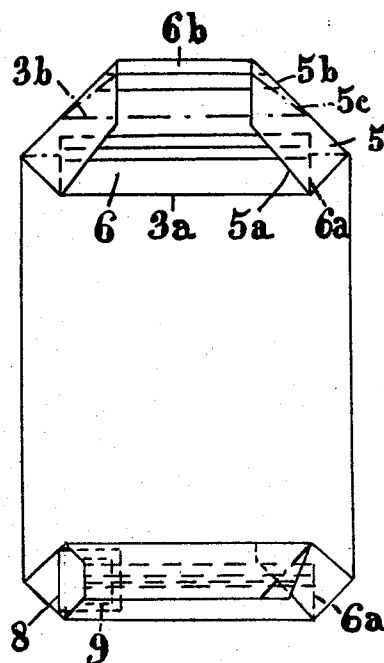


Fig. 3.

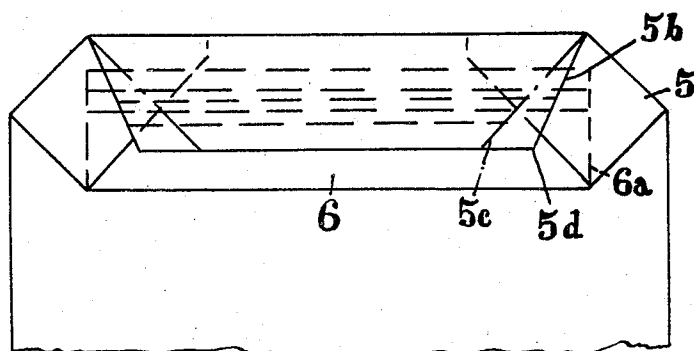


Fig. 5.

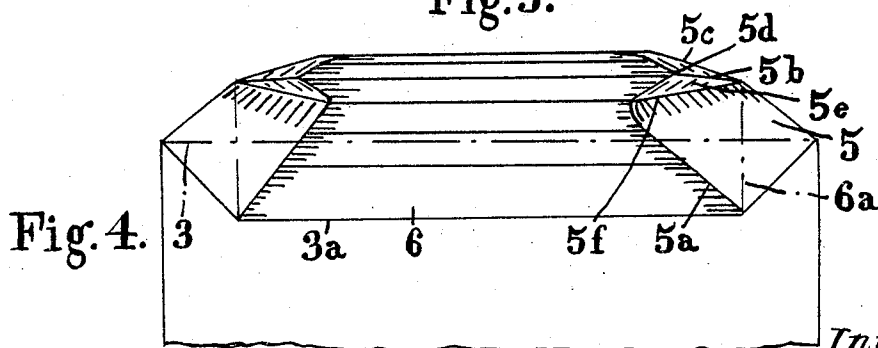


Fig. 4.

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3 Sheets-Sheet 2

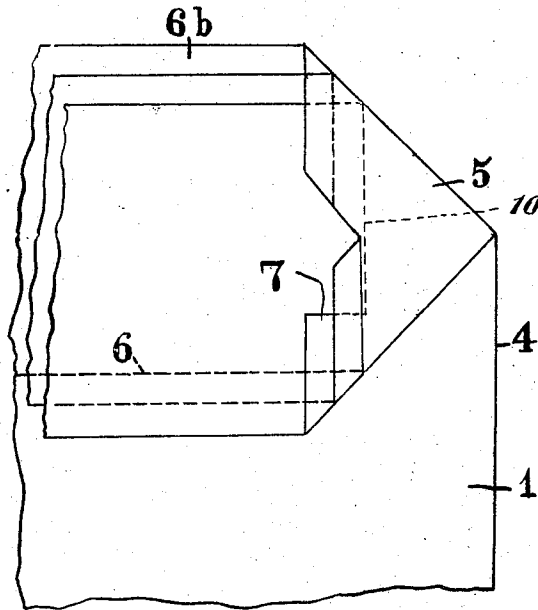


Fig. 2

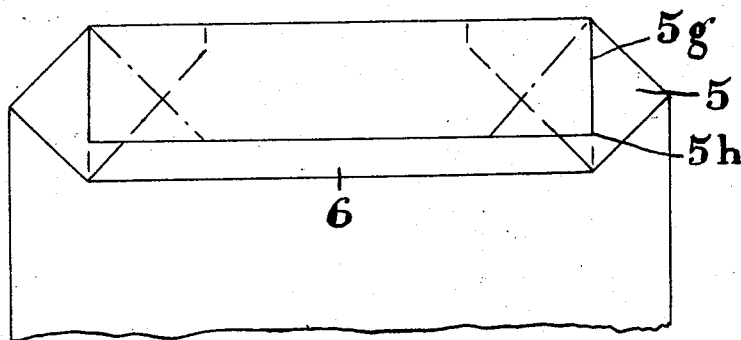


Fig. 6.

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3 Sheets-Sheet 3

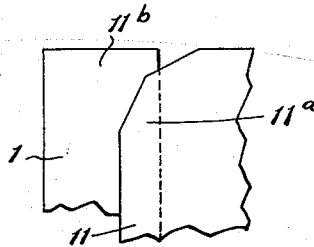


Fig. 7.

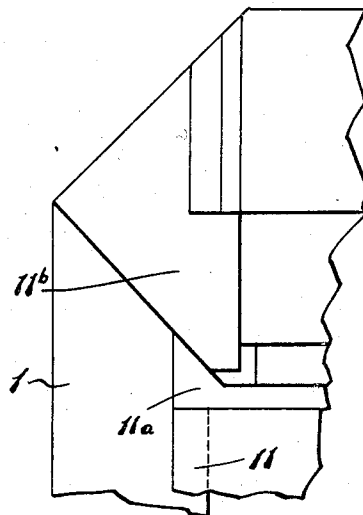


Fig. 8.

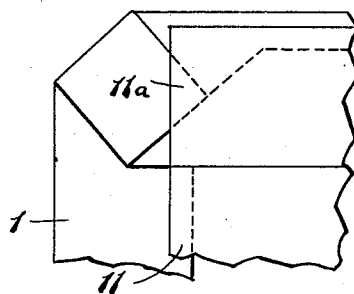


Fig. 9.

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UNITED STATES PATENT OFFICE

2,360,720

BLOCK-BOTTOM CLOSURE FOR MULTIPLY
PAPER BAGS OR SACKSFoster Gotch Robinson, Bristol, England, assignor
to Paper Sacks Limited, Bristol, EnglandApplication January 29, 1943, Serial No. 473,993
In Great Britain July 22, 1941

4 Claims. (Cl. 229—58)

This invention relates to improvements in paper or like multiply blockbottom bags or sacks having the end margins or headings of a nested series of sack tubes made in stepped relation so that when the blockbottom is folded, the stepped heading on one face of each flattened tube is superposed upon and adhesively secured to the heading on the opposite face of the same tube, such as described in U. S. patent specifications Nos. 2,073,222 and 2,100,519. In considering a flattened nested series of sack tubes of the above character it will be appreciated that the stepped headings of the front and back of the tube at either end thereof face in one and the same direction but that the stepped headings at one end face in the opposite direction to those at the other end. For convenience of reference the one set of stepped headings may be referred to as the "front headings" while the other set may be described as the "back headings."

In making an ordinary blockbottom closure in a sack tube the first step is to fold the front headings flat upon the tube. This operation automatically pulls the right and left corners (at the ends of the tube side folds) inward and when pressed down two triangular side flaps are formed. After this stage the front headings are refolded over upon themselves together with the adjacent corners of the triangular flaps, making a fold at about 45° to the transverse folds of the tube, whilst the back headings are subsequently similarly folded upon the front headings so that the stepped portions may be adhesively secured together and the adjacent corner of the triangular flap is folded upon the previously folded triangular corner.

The aim of the present invention is to provide an improved secure dustproof form of blockbottom closure in a nested series of bag tubes of the above character (i. e., having stepped headings) which possess the advantage that they afford a greater capacity than that afforded by the ordinary sack tubes for a given tube length or quantity of paper.

The invention also enables a somewhat stronger closure to be made at the ends of the stepped headings than with the ordinary blockbottom form of closure.

The present invention consists in a method of forming a blockbottom closure in a multiply paper sack of the character indicated, wherein after folding a headed portion and forming triangular side flaps in the manner employed for the ordinary blockbottom closure a headed portion is again folded transversely of the sack and the ends

thereof are folded under the adjacent portion of the triangular side flaps, and the other headed portion is finally folded on to the previously folded headed portion with a fold at the triangular side flaps disposed at an angle (such as for example at an angle of 60°–90° to the transverse folds of the sack) greater than that usually employed in making a similar fold in the ordinary blockbottom closure.

The closure may be made in tubes in which the corners of the tube have a V notch as in U. S. Patent No. 2,100,519 or it may be applied to a tube where the V notch is omitted and the margins are cut down square at the side folds of the tube; also, notches of other than V shape may be formed, and the notches in different layers may be different in shape and/or size. In all cases the rear headed portion is folded at the end along a line at an angle greater than 45° to the base fold line of the portion. Preferably the angle of this fold is 60°–65° but a satisfactory closure may be effected with the fold even beyond an angle of 90°.

In the accompanying drawings—

Figure 1 is a front elevation illustrating a nested series of flattened tubes with stepped headings wherein the headings at the top of the sack tube are shown in full lines while those which face in the opposite direction at the bottom of the tube are shown in dotted lines. The top of the tube illustrates a square cut tube and at the bottom the tube is drawn to show an alternative arrangement with the corners cut in the manner which produces a V notch at the end of the side folds of the tubes.

Figure 2 is a fragmentary side elevation of the sack tube showing the first folding operation (as applied to a tube having the outer plies V notched and the inner ply square cut) in a similar manner to that employed in the known blockbottom closures.

Figure 3 is a front elevation of a sack tube according to the invention illustrating at the top of the tube a further stage in the folding operation at the top of the tube and a completed closure and a form of valve at the bottom of the tube.

Figure 4 is a fragmentary front elevation showing a final folding operation in which the back headings of the tube are folded down upon the front headings and the upper corners of the triangular side flaps are refolded upon themselves.

Figure 5 is a fragmentary front elevation showing an enlarged view of a completed end closure of the top of the tube seen in Figure 3.

Figure 6 illustrates a modification of the in-

vention in which the triangular side flaps are refolded upon themselves to produce a final right-angular fold.

Figure 7 illustrates a corner of a bag tube in the first stage of forming an improved valve closure with an integral covering flap.

Figure 8 illustrates the improved mode at a later stage of folding the valve closure, and

Figure 9 shows the completed valve according to the mode of operation shown in Figures 7 and 8.

In carrying the invention into effect according to one convenient mode as applied to a nested series of sack tubes 1 having stepped headings 1a, for making a valve sack, the headings are square cut at the top (i. e., not V-notched) as exemplified at 2 on the upper end of the sack tube shown in Figure 1. It will be appreciated that the stepped headings 1a at the top of the tube face outwardly and are shown in full lines, while those at the bottom of the tube face in the opposite direction and are shown in dotted lines, and that the outermost tube has the longest heading at the back of the tube and will be cut to the maximum amount at the front of the tube whilst the innermost tube will be longest at the front and shortest at the back. The reverse arrangement will be observed at the bottom of the tube shown in Figure 1. The stepping of the headings is seen more clearly in Figure 2.

In folding the improved blockbottom closure in a nested series of tubes having stepped headings as indicated the top portion of the front plies of the tube, including the stepped headings, is creased transversely on the chain line 3 and folded flat into the plane of the sack, as illustrated in Figures 2 and 3, in the manner of an ordinary blockbottom closure (although in Figure 2 the V notch is exemplified). This operation causes the corners of the sack at the ends of the side creases 4 to fold inwardly and form the triangular side flaps 5 (Figure 2) referred to hereinbefore.

In the next operation (dealing with the upper end of the tube as seen in the drawings) the folded front headings are refolded (at the line 3a) upon themselves upwardly and inwardly into the position shown at 6 (Figure 3), while at the right- and left-hand ends the headings are folded at right-angles to the transverse folds of the tube along the line 6a and tucked under the inward sides of the lower corner of what has been referred to as the triangular side flaps 5, so that the folded ends of the headings lie in between the adjacent corners of the triangular side flaps 5 and the adjacent portion of the stepped headings 6, leaving the side flaps 5 displayed in trapezate shape (see Figure 3) with a crease or fold 5a at the inward lower edge. This right-angled folding at 6a underneath the side flaps it will be appreciated constitutes a feature distinguishing the present closing operation from the ordinary blockbottom folds in which the front headings are folded over with the lower corners of the triangular flaps so that the corners lie over the body of the flaps.

In order adhesively to secure the closure, the most convenient course is to apply adhesive to the headings previous to the folding operation. Thus when the right-angled folds 6a are formed and the side flap corners are pressed down the facing areas of the under folded portions and the side flap corners will be adhesively secured together.

In Figure 4 the beginning of the final closing operation is seen. The back headings 5b are folded upon the crease or folding line 3b upon the front headings and at their right and left ends are folded on the crease 5b instead of on the line 5c, as would be the case if the ordinary blockbottom final closing fold were being made. By folding on the line 5b this edge fold lies at about 65° to the folds of the closure that lie transversely of the sack, instead of at a lesser angle as employed in the ordinary blockbottom closure. The increased angle of fold ensures that the folded back heading corner 5d covers the underlying step of the front heading and is adhesively secured thereto, completing a dust-proof seal at this point and preventing the corner being pulled up. The folding operation shown in Figure 4 is completed by folding down the back headings so that they overlie or register with the front headings where they are adhesively secured, producing the closure seen in Figure 5.

Adhesive may be applied to secure the surface 5e which lies between the creases 5f and 5c (see Figure 4) to the equivalent area of the trapezate portion 5 of the side flaps to give additional sealing and strength.

In forming the closure at the right-hand corner of the lower end of the sack it will be observed that as the facing direction of the headings is the opposite of those at the upper end of the sack, the back headings (and not the front) are first folded inwardly upon themselves and their ends folded to make the right-angled fold 6a under the adjacent corner of the triangular side flap, after which the front headings are folded upon the steps of the back headings and adhesively secured while at the same time a fold of about 65° is made similar to the fold 5b already described. The left-hand corner is folded to form a valve as described below.

The invention may be carried into effect in a similar manner exemplifying a 90° fold as applied to a case where a sack tube is formed with stepped headings and V notches 7 (see Figure 2 and lower part of Figure 1) according to U. S. patent specification No. 2,100,519, at the extremity of the side folds of the flattened tube and separating the front and back headings. In this case, the initial folding operation is carried out as before and the formation of the right-angled folds 6a underneath the side flaps is similarly effected but in this case, instead of folding on the creases 5c (Figure 4) when the projecting headings are folded down on to the previously folded headings, still deeper folds are made so that creases 5g (Figure 6) are effected which lie at a right-angle to the transverse folds and the top line of the bag. Adhesive is applied to the underside of these folds or to equivalent areas on the opposite portion of the side flaps 5, as in this case the corner 5h does not overlap the headings first folded and becomes adhesively secured thereto but lies on the outer side of the triangular side flaps.

Although in the form in which a V-notched tube is employed angular folds of about 90° have been described, nevertheless it is generally preferred that the folds should be made at about 65° or at some lesser angle than 90° while still securing sufficient overlap to cover the adjacent parts of the stepped headings where the top of the outermost tube passes under the lower corners of the triangular flaps.

It is to be understood that although specific

angles have been stipulated herein it is not necessary that the fold should be made at the specified angle of 65° (or 90°) but a fold is made at an angle greater than that used in the equivalent fold of the ordinary blockbottom closure. For instance, the fold may be made at an angle somewhere between 60° and 90°, according to the amount of overlap required to cover and seal the previously folded parts.

The invention may be applied to valve sacks of the type described, in which case the folding at the side flaps as described above is effected at three corners of the tube while the fourth corner may be folded according to any suitable known blockbottom folding operation and left unpasted so that there is an orifice for the introduction of the filling tube.

For example, as seen in the left-hand lower corner a valve closure is formed after the manner described in U. S. patent specification No. 2,100,519 where the tube is slit and folded and paper labels of U-shaped pieces 8 and 9 are applied to prevent the filling material sifting in between the stepped headings. Also in severing sack blanks from a tube, where a valve is to be formed in one sack, paper may be taken from the notch in the abutting corner of the next sack to extend at least one ply of the valve so as to decrease the danger of leakage. For this purpose, at least the inner ply may be cut along the line indicated at 10 in Figure 2, whether the other plies are square cut or notched.

The invention may also be applied to open-mouth sacks, that is to say sacks in which the bottom is formed with an adhesively secured blockbottom closure according to the invention, while the top of the sack is left unclosed until it has been filled by hand or through a suitable spout. After the filling operation has been completed the top headings of the sack may be folded down in the described manner and adhesively secured. In order to facilitate the formation of the top closure the contents of the sack should be shaken down or otherwise formed into a fairly flat surface over which the folding operations can be performed.

According to another improvement providing an alternative mode of forming a valve closure dispensing with the need for covering the outer label, the bag tubes or the outer bag tube is fold-

ed and formed so that the longitudinally secured seam 11 (Figures 7, 8 and 9) is positioned laterally so that it intersects or overlaps the valve forming folds. The seam is secured for the major portion of its length but toward one end is left unstuck to provide a free flap or corner 11a (Figures 7 and 8) and this corner instead of being folded inwards (as when forming a valve according to the usual method) is made to lie over the mouth of the valve (as shown in Figure 9) and is adhesively secured to its outer side, while the flap or corner of the complementary part of the seam only is infolded (as at 11b, Figure 8) in forming the valve.

The improved valve formation may be applied to bags having tube closure folds as described herein or it may be applied to a bag tube provided with any of the usual blockbottom closures.

Obviously, the longitudinal seam may have the same relation to the corner flap and the side flap whether the corner flap is left free to form a valve or is adhered to the overlying side flaps to form the usual blockbottom closure, but the arrangement is particularly good when the corner flap is left free to form a valve.

I claim:

1. A multiply paper sack of the character indicated wherein corners of triangular side flaps are folded under the adjacent portions of said triangular side flaps and the outer headed portion is folded and secured to the previously folded headed portion with a fold at the triangular side flaps disposed at an angle greater than 45° to the line about which said headed portion is folded.

2. A multiply paper sack as claimed in claim 1 wherein the folds at the triangular side flaps are at 60°-90° to the transverse folds of the sack.

3. A multiply paper sack as claimed in claim 1 wherein the folds at the triangular side flaps are at about 65° to the transverse folds of the sack and the corners of the folds are secured to the stepped headings.

4. A multiply paper sack as claimed in claim 1 wherein the folds at the triangular side flaps are at about 90° to the transverse folds of the sack and the folded portions are adhesively secured to the triangular side flaps.

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