

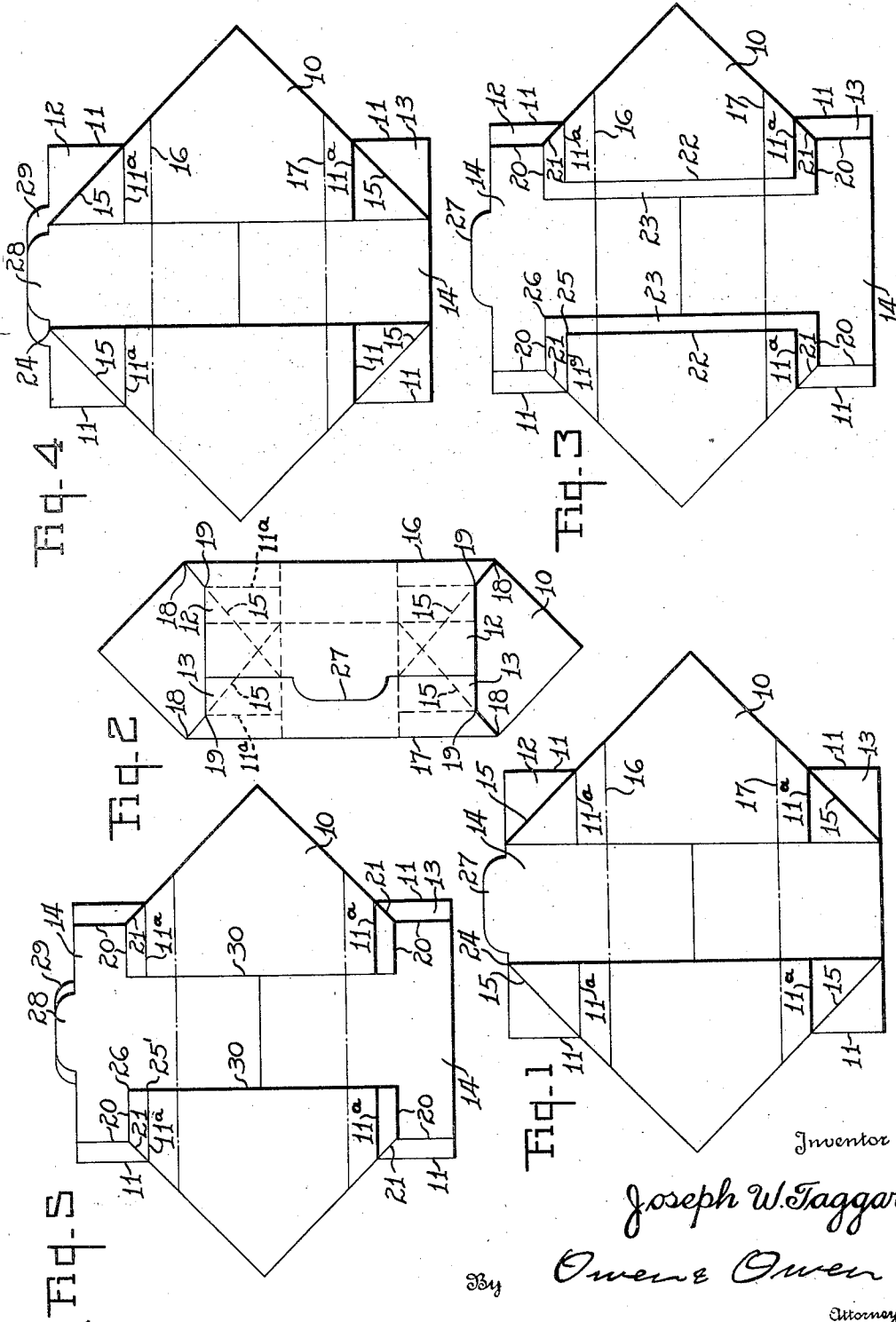
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MULTI-PLY PASTED END BAG

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MULTI-PLY PASTED END BAG

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The invention relates to a multi-ply pasted end bag. The invention has for its purpose to form a pasted end on a multi-ply bag that will combine simplicity of formation with secure and sift-proof closing. The invention may be applied to a bag having two layers or any greater number of plies. The object of the invention is obtained primarily by folding different layers along different lines for a portion of the way so that the edges of the flaps do not entirely coincide and so that they overlap and aid in securing each other in position and sealing openings at points where they are most likely to occur. 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 an inverted plan view of a bag bottom embodying one form of the invention and opened out preparatory to closing. Figure 2 is a similar view of the same embodiment of the invention with the formation of the closure completed.

Figures 3, 4 and 5 are views corresponding to Figure 1, but each showing a slightly modified form of the invention.

In describing the figures reference will be made to an inner ply and an outer ply only for purposes of description, but it must be understood that either the outer ply or the inner ply, as described for the purposes of this invention, may consist of a plurality of layers if desired.

In Figure 1, the outer ply 10 is shown slit at 11 and opened up to form a rectangular fold for a satchel-bottomed bag, the opened out side flaps being indicated at 12 and 13. The inner ply 14 is not slit, but is opened out in a full diamond fold, the corner folds being shown at 15 extended beyond where the corner folds of the outer ply meet slit 11.

In closing the end of the bag the lower flap 13 is folded about line 17 and the upper flap 12 is folded on the line 16, the flaps being pasted down and together to form the closure disclosed in Figure 2. All of the plies of the bag walls are bent about lines 16 and 17 and form a somewhat curved fold so that there is sometimes leakage along this crease at points indicated at 18 on Figure 2. However, the end flaps extend from these points for some distance so that the leakage is not usually great. Such leakage as there is in an ordinary full diamond fold bag or in a rectangular fold bag where the end of all the plies are slit as is the outer ply of Figures 1 and 2, is minimized somewhat by the construction shown in the drawing because the outer flaps 12 and 13 extending beyond

fold 15 are thinner and more flexible than they would be if they consisted of all of the plies of the bag wall, as would be the case if all plies were slit at the same point, and accordingly, being more flexible, they fold down more closely and securely upon the end flap and hold folds 15 in position more closely so that it is difficult for the folds to open up at points 18.

However, the leakage at points 18 is not usually the most serious, and the reduction of leakage at these points is not the main object of the present invention. It will be readily seen that if all plies are given a complete diamond fold along lines 15, the end flaps will be thick and somewhat stiff and during handling of the bag may crack apart along some lines where they are bent, so as to allow leakage. Where all of the plies are slit in a manner similar to that shown for the outer ply in Figures 1 and 2, the thickness of the flaps along the edges where they are pasted down is only one-half what it is along line 15 when a full diamond fold is made. However, in heavy bags it may not fold down over edges 11^a sharply enough to prevent small leakage channels along those edges to points 19. It is difficult to manufacture bags so that the slits 11 terminate exactly at points 19, and the most serious leak openings occur when there is any extension of the slits beyond these points because of inaccurate folding or too deep cutting or tearing of the slits.

In the form shown in Figures 1 and 2 it will be readily seen that only the outer ply holds up the flaps at points 19 so that the openings otherwise formed at these points are greatly reduced on that account, and also the flaps 12 and 13 paste down closely to points 19. Furthermore the continuation of the fold 15 of the inner ply beyond point 19 forms a seal for that point, as the inwardly directed edges of this flap, extending from fold 15 towards the center of the bag, act as a pocket valve which would close openings at point 19 even if there were as great openings there as in the ordinary type of slit, rectangular folded bag.

For the above stated reasons, the construction shown reduces the leakage to a minimum so that even such fine material as carbon black can be shipped in such a bag without objectionable sifting.

It is evident that the bag end can be formed by the usual closing operations, the only difference being that only the outer ply is slit at 11 instead of all of the plies.

Where there are more than two plies, the slit may be through only the outer ply and all of the

other plies may be given a full diamond fold, in which case the opening at points 19 is reduced to a minimum and flaps 12 and 13 have a maximum flexibility. On the other hand, the slit may be through all but the inner ply, in which case the openings at 19 will be greater and flaps 12 and 13 will not have as great flexibility, but the inner ply forming a valve for closing the opening at 19, or any opening which may occur by loosening of the paste between the flaps, has the maximum flexibility and efficiency. If there are four or more plies in the bag wall, two or more may be slit and two or more left for the full diamond fold, it being a matter of choice as to how many plies are folded in either of the two ways.

In the construction shown in Figure 3, the outer ply is slit and folded in the same manner as in Figure 1, with one exception which will be noted later. Accordingly the same reference numerals are applied to the outer ply in Figure 3 as in Figures 1 and 2.

In Figure 3, the inner ply 14 is slit at 20 parallel with slits 11, but not so deeply. Accordingly when the bag end is opened up as shown in Figure 3, the diamond fold of the inner ply extends at 21 beyond the point where the inner ply reaches the end of slit 11. These extending portions 21 act to seal the ends of slits 11 in the same way as described in connection with folds 15 and openings 19. Accordingly the form shown in Figure 3 has the same sealing properties as the form shown in Figure 1 with the additional feature that the edges of the plies are more completely stepped so as to form a better contact with the underlying end plies.

Also the form shown in Figure 3 has the end flaps of the outer ply cut along lines 22 so that the end flaps of the inner ply extend at 23 beyond the end flaps of the outer ply to form a stepped seal at this point.

Another point of advantage of the construction shown in Figure 3 over the form shown in Figure 1 is that in the form shown in Figure 1 the end of fold 15 at 24 leaves an edge which tends to raise thumb tab 27 off of the underlying flap and provide a possible sift opening. In the form shown in Figure 3, the fold 21 ends at a point short of the edge, and the corner of the outer flap at 25 and the corner of the inner flap at 26 will not be located where either of them will form a sift opening. However, the necessity of forming two slits at different points and the cutting off of the ends of the outer plies of the end flaps, required by the form shown in Figure 3, renders the closure somewhat more difficult to form than that shown in Figures 1 and 2, and ordinarily the form shown in Figures 1 and 2 is sufficiently sift-proof so that the extra trouble in forming the closure indicated in Figure 3 is not justified.

Figure 4 shows a somewhat simplified manner of eliminating the sifting at points 24. The other portions of the bag being the same in Figure 4 as in Figure 1, the same reference numerals are applied. But there is a thumb tab 28 formed on the inner ply only, and a wider thumb tab 29 formed on the outer ply, so that the extensions of the outer thumb tab 29 will be pasted down over corners 24 and prevent leakage.

Figure 5 shows thumb tabs formed in the same manner as in Figure 4, although the fold is not extended along line 15 to point 24 as shown in Figure 4, but is extended only along line 21 to slit 20, as shown in Figure 3. This forms stepped edges of the plies, as discussed in connection with

Figure 3, except that the end flaps of the outer ply are not cut off as in Figure 5, but come flush along lines 30 with the ends of the inner flaps. It will be obvious that the cutting off of the outer ply of the end flaps along line 22 might be omitted from the form shown in Figure 3 as well as in Figure 5, in which case the operation would differ from Figure 1 only by employing slits 20 in the inner ply instead of making a full diamond fold therefor.

Ordinarily in making a multi-ply bag, especially where the plies are separate and relatively movable throughout most or all of their area, there is difficulty in forming a satisfactory pasted end closure because the several plies of at least the outer flap must be pasted together or else their ends stepped so that the outer ply of the outer flap will be pasted down. In each of the forms shown, it will be seen that the outer ply of both of the side flaps will be separately pasted at its corners to the underlying flap so that the pasting together of the several plies of the outer flap is not necessary. This also is an advantageous feature in that it renders the bag end more flexible and less likely to form leakage cracks when bent.

It will be noted that the different lengths of thumb tabs may be employed or omitted with each of the forms shown. It will be further noted that in each case the diagonal fold, or what may be termed, for purposes of brevity, the diamond fold of the inner ply, is extended farther than the corresponding fold of the outer ply and this extension of the diamond fold of the inner ply forms a seal for the end of the diamond fold of the outer ply. Also in each of the forms shown, the corners of the outer ply of both of the side flaps extend beyond the inner ply of the same flap so that the outer ply is separately secured to the underlying flap and is held in place regardless of whether or not it is adhered to the inner ply of the same flap.

While several variations of the invention have been shown, it will be readily understood that other changes may be made in the shape and design of the bag end within the scope of the appended claims.

What is claimed is:—

1. A multi-ply bag having a pasted end closure in which the outer ply is slit to form the usual rectangular fold for a satchel bottomed bag, and the diagonal corner fold of the inner ply is continued beyond the point where it passes the end of the slit of the outer ply, whereby the inner ply forms a seal for the end of the slit in the outer ply.

2. A bag in accordance with claim 1, and in which the inner ply has a thumb tab on one side flap and the outer ply has a wider thumb tab on the same side flap, whereby the sides of the thumb tab on the outer ply extend beyond the edge of the thumb tab on the inner ply.

3. A bag in accordance with claim 1, and in which the inner ply is formed with a full diamond fold.

4. A bag in accordance with claim 1, and in which the inner ply is provided with slits parallel with, shorter than, and nearer together than the slits in the outer ply.

5. A bag in accordance with claim 1, and in which the outer ply of each end flap of the closure is shorter than the inner ply of said flap.

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