

March 6, 1956

J. F. DOYLE

2,737,339

MULTIPLY BAGS

Filed Oct. 2, 1951

2 Sheets-Sheet 1

FIG. 2

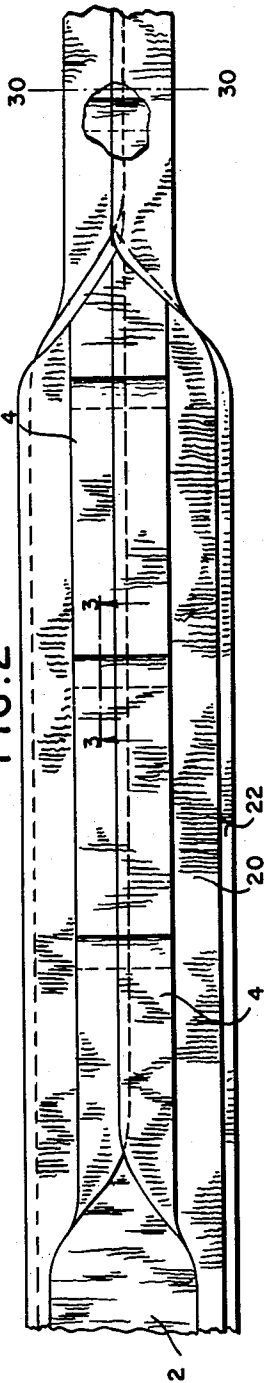


FIG. 3

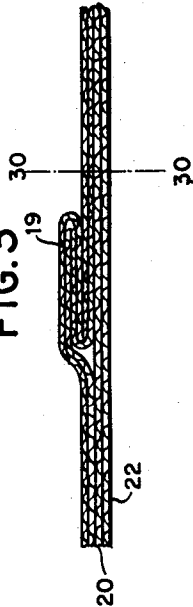
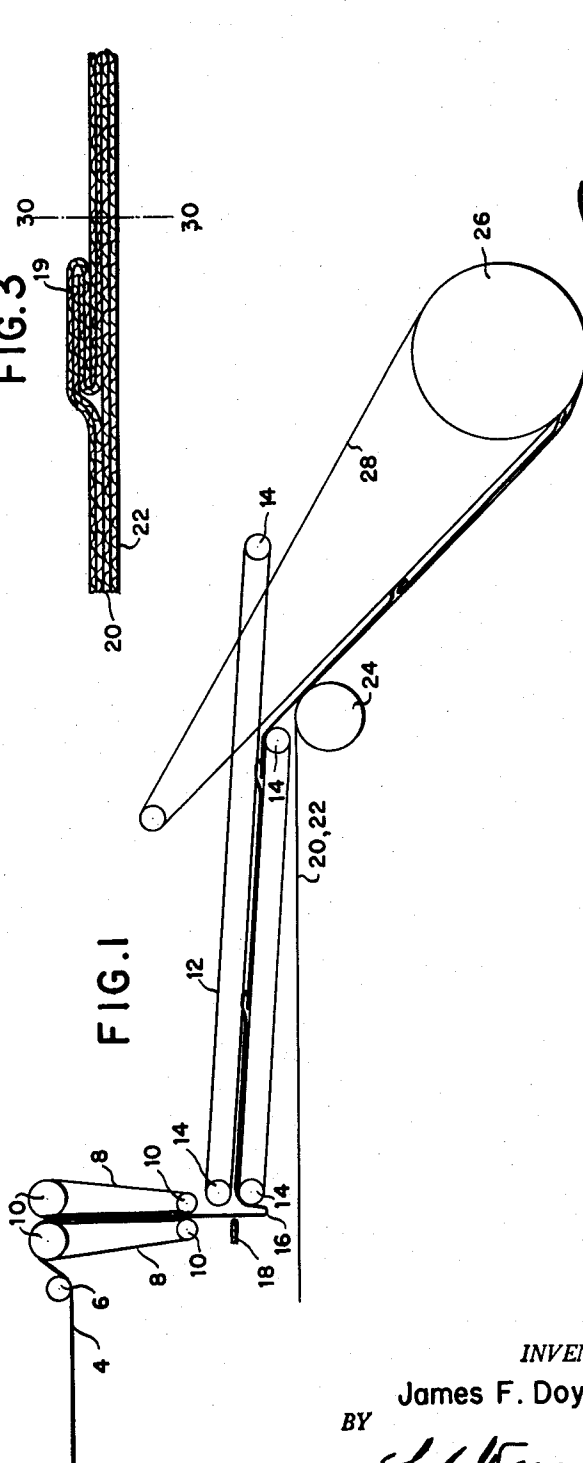


FIG. 1



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FIG. 4

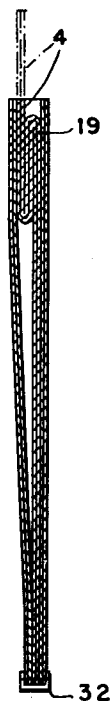


FIG. 5

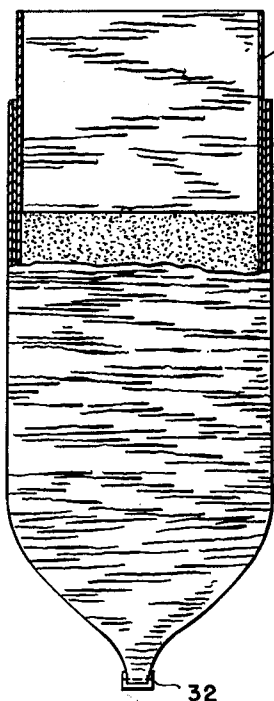


FIG. 6

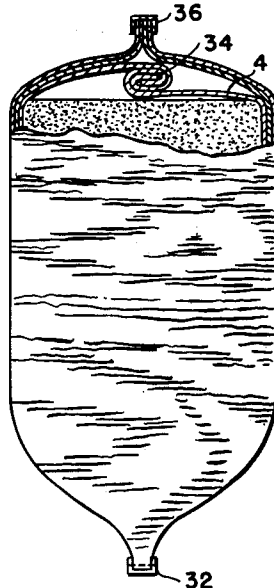


FIG. 7

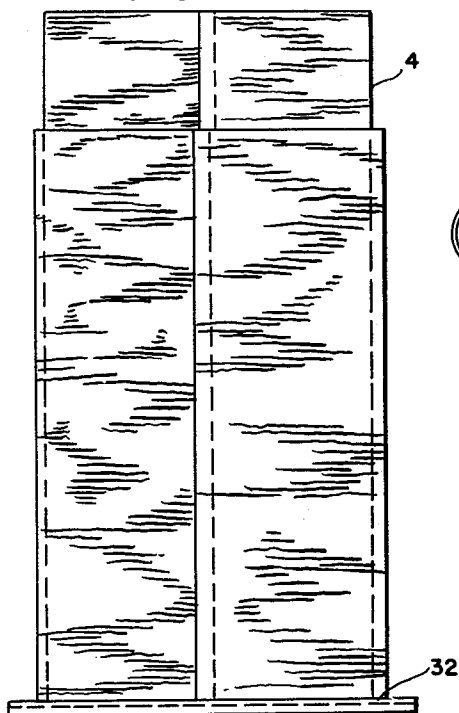
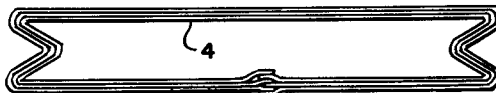


FIG. 8



FIG. 9



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2,737,339

MULTIPLY BAGS

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Application October 2, 1951, Serial No. 249,319

3 Claims. (Cl. 229—55)

The present invention relates to multi-ply bags, and has special reference to such bags made of crinkled paper having the crinkles extending circumferentially of the bag to provide for longitudinal stretchability.

Bags of this type are frequently used for chemicals and certain other finely divided material that must be protected from air and moisture, and when thus used are commonly provided with an inner coating or ply of polyethylene or other suitable air and moistureproof material. With such bags, it has been a serious problem to close the bag after filling with a seam that is of the necessary air and moistureproofness and capable of withstanding the severe strains to which the bag may be subjected during shipment and handling.

One of the objects of the present invention is to provide a bag of this character which when filled may be easily and conveniently closed by a seam which has the desired characteristics as above described.

Other of the objects of the invention are to provide a novel and improved bag.

The several features of the invention, whereby these and other objects may be attained, will be readily understood from the following description and accompanying drawings, in which:

Figure 1 is a diagrammatical side view of a machine which may be employed in forming my improved bag;

Fig. 2 is a plan view, partly diagrammatical, illustrating the manner in which the plies are folded in forming the bag;

Fig. 3 is a sectional view, on an enlarged scale, taken on the lines 3—3 of Fig. 2;

Fig. 4 is a longitudinal sectional view of the bag;

Fig. 5 is an edge view, partly in section, of the bag when filled but previously to closing;

Fig. 6 is a similar view of the bag when closed;

Fig. 7 is a side view of the bag previously to closing;

Fig. 8 is an end view of the bag; and

Fig. 9 is a similar view of the bag when provided with bellows folds.

In forming my improved bag, a web 2 of paper having a coating of polyethylene or other heat-sealable material is folded longitudinally and its longitudinal edges are adhesively secured together to form a flattened tube 4 (Fig. 2).

This tube may then be fed beneath a guide roll 6 and downwardly between belts or tapes 8 which are driven by rolls 10 over which the tapes pass. From the tapes 8 the tube passes between belts or tapes 12 which are driven by rolls 14 over which the tapes pass.

The tapes 8 are driven at a greater speed than the tapes 12 so as to form a vertical loop 16 in the tube 4 between the two pairs of tapes. At predetermined intervals, a tucking blade 18 engages the tube 4 above the loop and carries the surplus material provided by the loop between the tapes 12 so as to form folds 19 in the tube that are spaced apart predetermined distances.

Simultaneously with the feeding of the tube 4, webs 20 and 22, arranged in overlapping relation as shown, are

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fed longitudinally beneath and at the same surface speed as the pair of tapes 12. The webs 20, 22 pass over a guide roll 24 and beneath folding wheel 26 of the usual bag tube machine. As the webs 20, 22 pass from the guide roller 24 to the wheel 26, the tube 4 with the folds 19 therein pass over said webs 20, 22 and are held thereagainst by a belt or tape 28 which is driven by said folding wheel.

As the tube 4 and the webs 20, 22 pass through the tubing machine, the webs are folded over the tube and the longitudinal edges of each of them are secured together so as to enclose the tube 4.

After passing through the tubing machine, the tube 4 and webs 20, 22 are severed on lines 30 to form the bag lengths, the lines of severance being in proximity to the leading edges of the folds 19. The end of each bag length thus cut off which is remote from the fold 19 may be closed by a suitable seam 32 (Fig. 4).

In using the bag thus formed, the end of the inner tube or ply 4 is pulled out the width of the fold 19. The bag may then be filled through the projecting end of the ply 4 as indicated in Fig. 5, and then the end of said ply may be closed by a heat-sealed seam 34. The end of the ply 4 may be rolled or folded on itself and tucked into the bag as shown in Fig. 6. Thereafter the upper ends of the outer plies of the bag may be closed by a sewed or other suitable seam 36.

It will be apparent that the contents of the bag are effectively protected from air and moisture independently of any leakage occurring through the needle holes or otherwise in the bag closure seam 36. Also, inasmuch as there is no undue strain placed on the inner tube or ply 4 or in the heat-sealed seam 34 thereof, there is no danger of this seam becoming broken or leaking during handling of the bag in shipment.

Preferably, my improved bag is of the type of the one described and claimed in the patent to Greene 2,314,876, dated March 30, 1943. As in the case of that bag a plurality of outer plies such as 20, 22 are secured together at the crests of the crinkles, and if desired the portion of the inner ply or tube 4 inwardly of the fold 19 may be secured to the adjacent ply at the crests of the crinkles so as to cooperate with the outer plies to resist bursting strain, all of the plies being preferably of the same stretchability. While it is preferred that the bag be made of crinkled paper in accordance with said Greene patent, it will be apparent that satisfactory results may be obtained in other types of multi-ply bags such as those made of plain paper, or if desired the inner ply alone may be made of crinkled paper and the other plies made of plain paper. Also, while it is preferred that the inner ply be coated with a polyethylene or other heat-sealable material this is not necessary in some instances, and in fact the inner ply may be made entirely of polyethylene or other material, preferably moistureproof. The folds 19 in the inner ply may be made so as to enable the ply to be extended any required length to effect the required sealing and tucking or tying in thereof. In the case of a bag about two feet wide and three and one-half feet long the extension of the length from ten to twelve inches is usually sufficient.

The bag may be either of the non-gusseted type as shown in Fig. 8, or the gusseted type as shown in Fig. 9. In the case of the gusseted type, the gussets may be made in the tube 4 previously to the tube being enveloped by the outer plies, and upon forming the gussets in the outer plies and opening up the bag and pulling out the fold 19 as described, the gussets in the tube 4 readily adjust themselves to the gussets in the outer plies.

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:

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1. A bag of the class described comprising a flattened tube having a plurality of tubular plies, and a seam closing one end of the tube, the other end of the tube being open, the inner ply having its outer end normally flush with the open end of the tube, and said inner ply while in flattened condition being folded transversely upon itself providing a transverse double-fold to permit said ply to be extended a distance beyond the open end of the tube.

2. A structure according to claim 1 in which the plies of the tube are made of crinkled paper with their crinkles extending circumferentially of the tube to provide for longitudinal stretchability, and in which said double fold of the inner ply is positioned in proximity to the open end of the bag, and the portion of the inner ply extending inwardly from said folded portion having the crests of its crinkles secured to the crests of the crinkles of the adjacent ply.

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3. A structure according to claim 1 in which said inner ply is made of polyethylene.

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