Feb. 23, 1943. T. M. AVERY 2,312,280

BAG

Filed Oct. 10, 1940

FIG. 1.

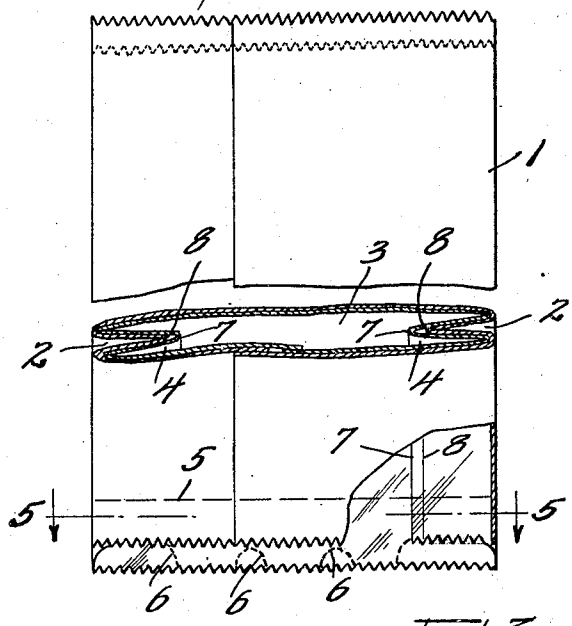


FIG. 2.

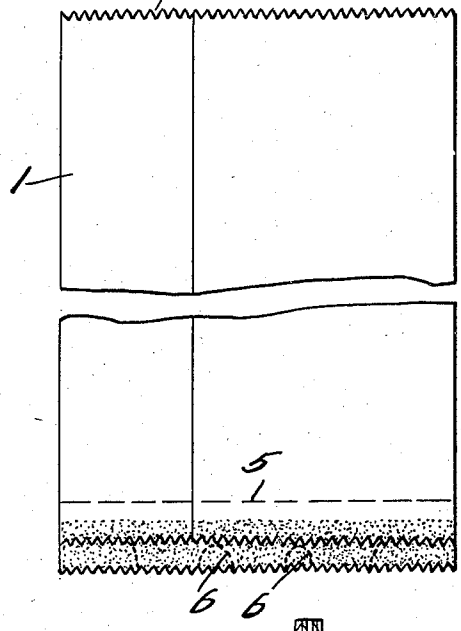


FIG. 3.

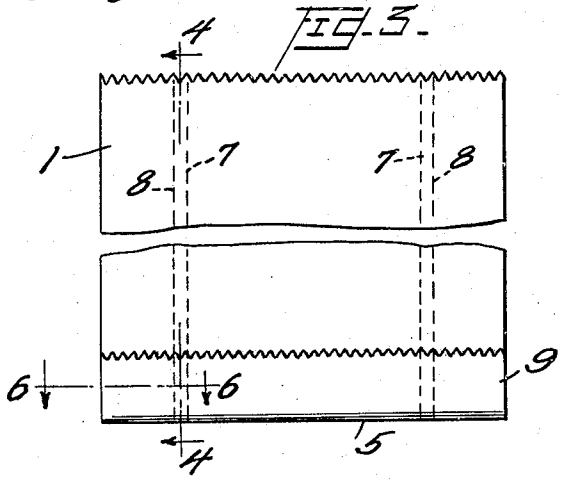


FIG. 4.

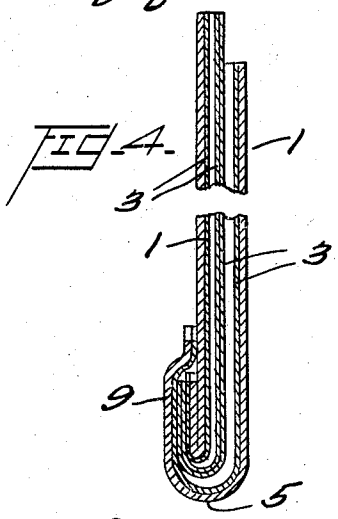


FIG. 5.

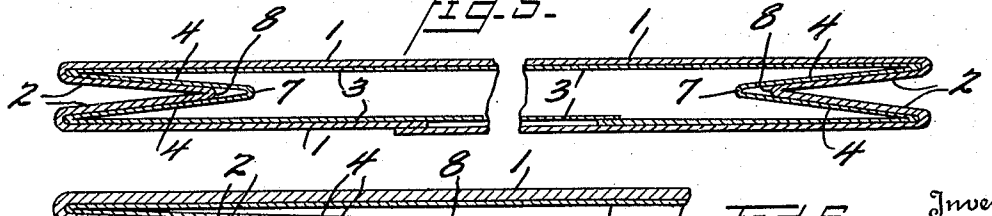
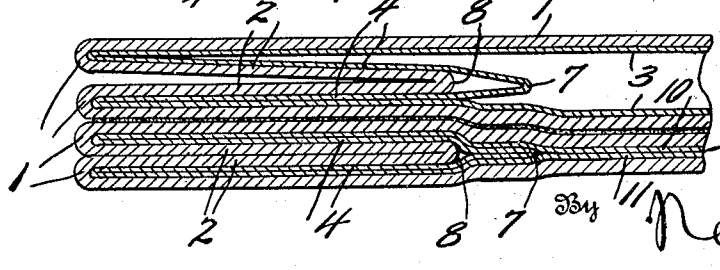


FIG. 6.



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2,312,280

BAG

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Application October 10, 1940, Serial No. 360,654

7 Claims. (Cl. 229—3.5)

The present invention relates to improvements in bags, and more especially to those of the so-called duplex type composed of an outer bag or ply of paper or similar fibrous material and an inner liner or ply usually of an air and moisture proof material, and the primary object of the invention is to provide a novel structure in a bag of this type, which enables it to be sealed effectively in the closing fold at the bottom and/or top of the bag.

Heretofore, difficulty has been experienced in effectively sealing the bottom or top of bags having inner liners, and especially in heat sealing bags of the usual so-called square type having nested tucks in their edges and composed of an outer bag or ply of paper or similar fibrous material and an inner liner composed of heat sealable material, due to the fact that the inner fold lines of the infolded tucks of the inner liner were so close to the inner fold lines of the infolded tucks of the outer bag as to form a relatively thick ridge which prevented close contact of the portions of the inner liner which extend into the closing fold or folds and serve to seal the end or ends of the bag, and frequently caused pin holes in the seal or seals which resulted in leakage when the bag is filled with powdery or other finely divided material.

The present invention overcomes this difficulty in a simple and effective manner, although the improved bags may be made with the same facility as ordinary bags of this type, and without increasing the cost thereof.

In the accompanying drawing:

Figure 1 is a side elevation, partly broken away, of a partially completed bag embodying the present invention;

Figure 2 is a view of the improved bag ready for completion by folding and securing of its bottom fold;

Figure 3 is a side elevation, partly broken away, of the completed bag;

Figure 4 is a vertical section of the completed bag, on an enlarged scale, taken on the line 4—4 in Fig. 3;

Figure 5 is a detail section, on an enlarged scale, taken on the line 5—5 in Fig. 1; and

Figure 6 is a detail section, on an enlarged scale, taken on the line 6—6 in Fig. 3.

Similar parts are designated by the same reference characters in the several figures.

The bag, as shown in the present instance, is of the so-called square type comprising an outer bag 1 formed from a tube of paper or similar fibrous material having tucks 2 folded inwardly at its vertical edges, and an inner liner 3 which may be formed into a tube from thin rubber sheeting such as that known commercially as "Pliofilm" which is vulcanizable or heat sealable by the application of heat and pressure, or from "Cellophane" of the wax-coated or heat sealable variety or other similar material, the inner liner being coextensive in length with the outer bag and extending across the front and rear walls thereof at their inner sides, and having tucks 4 folded inwardly at its vertical edges and nested with or lying against the inner sides of the tucks 2 of the outer bag. The inner liner is preferably secured at each end to the outer bag by spots of adhesive, as indicated at 6.

Heretofore, in the manufacture of bags of this type, the infolded tucks of the outer bag and inner liner have been coextensive in area and in exactly superposed relation so that their inner fold lines were coincident, or substantially so, thus forming relatively thick ridges which precluded the complete sealing together directly of those portions of the inner liner which lie within the closing fold, and caused puncturing of the inner liner due to its abrupt creasing or folding thereof over such relatively thick ridges.

According to the present invention, each tuck 4 of the inner liner is made deeper or extends into the bag to a greater extent than the respective tucks 2 of the outer paper or fiber bag, so that the inner fold line 7 of each tuck of the inner liner is offset or removed inwardly to a substantial extent from the inner fold lines 8 of the respective tucks of the outer bag, thus providing extensions of the inner liner in the regions of the fold lines 7 which are directly opposite to one another and the inner edges of which are removed inwardly from the fold lines 8 of the outer bag sufficiently to permit these extensions of the inner liner to come into direct and intimate contact and to be flattened into the form of thin flat strips. Consequently, when the opposite sides of the bag are pressed together, as across the portion thereof below the bottom fold line 5 when the closure seal is to be formed in the bottom closure flap 9 in a bag of the square type, these strip-like extensions of the tucks of the inner liner will be flattened and their inner fold lines 7 will be so far removed from the inner fold lines 8 of the tucks of the outer bag as to permit the opposed portions 10 and 11 of the liner which lie within the inner and outer walls of the closure fold or flap 9 to come into direct and intimate sealing contact with one another along the line 12 between the inner edges of the

tucks of the liner and to lie close to and make close sealing contact with the relatively thin extensions of the tucks of the liner as well as with the remainder of these tucks without obstruction by the inner edges of the tucks of the outer bag, thus forming an effective seal for the bottom closure of the bag in the regions of the closure adjacent to the inner fold lines of the tucks of the outer bag and inner liner and at all other points across the width of the bag, as indicated in Fig. 6. The uniting of these portions 10 and 11 of the inner liner below the fold line 5 may be effected by adhesive, but they are preferably united by heat sealing by the application of heat and pressure to the bottom flap 9 while the latter is unfolded, when the inner liner is composed of a heat sealable material as described. The bottom fold 9 may then be folded and secured in closed position to complete the formation of a square bag, either by heat sealing it by the exposed portion of the end of the inner liner, or by the application of an adhesive thereto in the manner usual with square bags, as indicated in Fig. 2. The same sealing effect obtained in the bottom closure of the bag, as described above, may be obtained in making the closure for the mouth or top of the bag, it being understood that the tucks of the inner liner extend inwardly to a greater extent than the tucks of the outer bag, throughout the length of the bag.

The improved bag structure provided by the present invention is particularly advantageous when employed in duplex bags of the type comprising an outer bag composed of a relatively thick and tough material such as kraft paper and the inner liner is composed of a relatively thin transparent or air and moisture proof material such as "Pliofilm," "Cellophane" or the like and which is comparatively fragile. In such cases, although the inner fold lines of the infolded tucks of the outer bag will be relatively thick and will form ridges over which portions of the inner liner lie, the extensions of the inner portions of the infolded tucks of the inner liner inwardly beyond these relatively thick ridges enable these inwardly extended portions of the inner liner to come together into close and direct contact and form inwardly projecting strips or extensions the inner edges of which are of much less thickness than that of the folded inner edges of the tucks of the outer bag and they are spaced inwardly therefrom. Consequently, the portions of the inner liner lying within the front and back walls of the closure fold or flap may be pressed together to make the seal without abrupt creasing or bending of the inner liner over such thick ridges as heretofore, thus avoiding leakage or puncturing of the inner liner at such points and, due to the thinness of the portions of the tucks of the inner liner adjacent to their inner edges, an intimate and effective seal is made between them and the portions of the inner liner within the front and back walls of the closing fold when these portions of the inner liner are pressed together.

Although preferably and as shown, the invention is applied to bags of the so-called square type employing a bottom fold or flap, and the closure seal is made in this fold or flap, it is to be understood that, if desired, the closure seal may be made in an end portion of the bag, as hereinbefore described, without folding this portion of the bag into a fold or flap, and that the invention may be applied to other duplex or multi-ply types of bags in which effective sealing at the inner fold lines of a liner is desired.

I claim:

1. A bag structure comprising an outer bag and an inner liner, the bag and liner having nested infolded tucks in their opposite edges, the tucks having fold lines at their inner edges, the inner fold lines of the liner being substantially parallel to and spaced inwardly from the inner fold lines of the bag, the tucks in the liner extending inwardly to a sufficient extent beyond the tucks in the outer bag to form strip-like extensions.

2. A bag structure comprising an outer bag and an inner liner, the bag and liner having nested infolded tucks in their opposite edges, the tucks having fold lines at their inner edges, the inner old lines of the liner extending longitudinally along and being spaced inwardly from the inner fold lines of the bag, the tucks in the liner extending inwardly beyond the tucks in the outer bag sufficiently to fold into direct flatwise contact with one another.

3. A bag structure comprising an outer bag and an inner liner both having nested infolded tucks in their opposite edges, the inner edges of the tucks being defined by fold lines, the inner fold lines of the tucks in the liner extending longitudinally of and being spaced inwardly from the inner fold lines of the bag sufficiently to form strip-like extensions of the tucks of the liner inwardly beyond the tucks in the outer bag, and opposed portions of the liner in an end portion of the structure being united to one another and to said inward extensions of the tucks of the liner to form a closure.

4. A bag structure comprising an outer bag and an inner liner both having nested infolded tucks in their opposite edges, the inner edges of the tucks being defined by fold lines, the tucks in the liner having their inner fold lines offset inwardly beyond the inner fold lines of the tucks of the outer bag sufficiently to provide the portions of the tucks of the liner extending inwardly beyond the inner fold lines of the tucks in the outer bag adapted to flatten and contact with one another directly, and opposed portions of the liner in an end portion of the structure being united to one another and to the inner fold lines and adjacent flattened contacting portions of the tucks of the liner to form a closure.

5. A bag structure comprising an outer bag of fibrous material and an inner liner of heat sealable material, said bag and liner having correspondingly arranged tucks folded inwardly at their edges, the inner edges of the tucks being defined by fold lines, the inner fold lines of the liner being substantially parallel to and spaced inwardly from the inner fold lines of the bag, the tucks of the liner being deeper than those of the outer bag, and providing strip-like opposed portions offset inwardly from the fold lines at the inner edges of the tucks of the outer bag, and opposed portions of the liner in an end portion of the structure being heat sealable to one another and to the inner edges of the tucks in the liner.

6. A bag structure comprising an outer bag of fibrous material and an inner liner of heat sealable material, said bag and liner having correspondingly arranged tucks folded inwardly at their edges, the inner edges of the tucks being defined by fold lines, the inner fold lines of the liner being substantially parallel to and spaced inwardly from the inner fold lines of the bag, the tucks of the liner being deeper than

those of the outer bag and forming strip-like extensions of the liner disposed inwardly beyond the inner fold lines of the tucks of the outer bag and foldable together flatwise, and the liner having opposed portions in an end portion of the structure which are heat sealed to one another and to the inward extensions of the liner.

7. A bag structure comprising an outer bag of relatively thick paper and an inner liner of relatively thin heat sealable material, and folded transversely to form an end closure, said bag and liner having correspondingly arranged tucks folded inwardly at their edges, the inner edges of the tucks being defined by fold lines, the inner fold lines of the liner being parallel to and spaced inwardly from the inner fold lines of the bag, the tucks of the liner being deeper than those of the outer bag and forming strip-like extensions at their inner edges which are folded flatwise into direct contact in the end closure beyond the inner edges of the tucks of the bag, and the liner having opposed portions in the end closure which are heat sealed to one another and to said extensions of the liner.

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