

Jan. 16, 1962

E. S. KARDON ET AL

3,017,069

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2 Sheets-Sheet 1

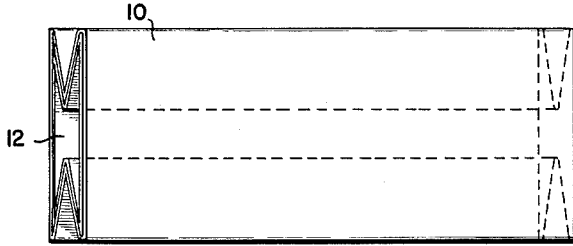


FIG. 1.

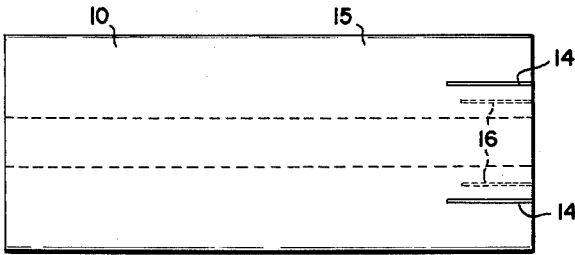


FIG. 2.

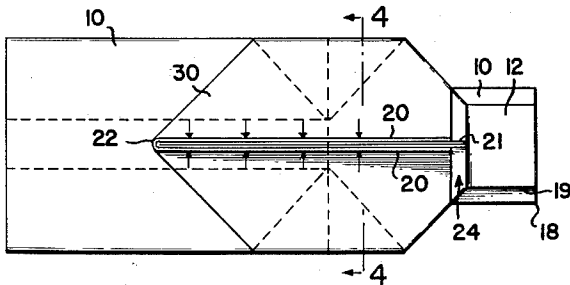


FIG. 3.

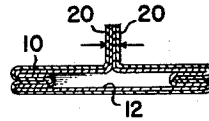


FIG. 4.

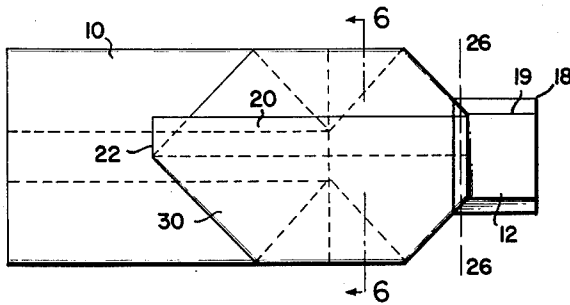


FIG. 5.

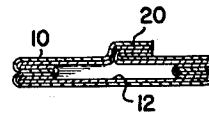


FIG. 6.

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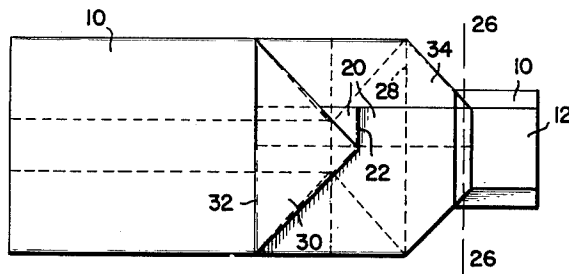


FIG. 7.

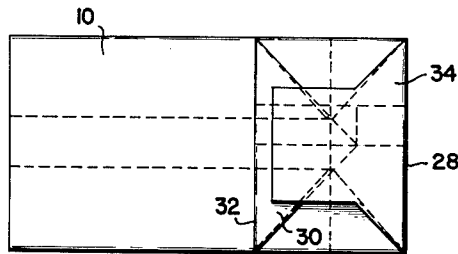


FIG. 8.

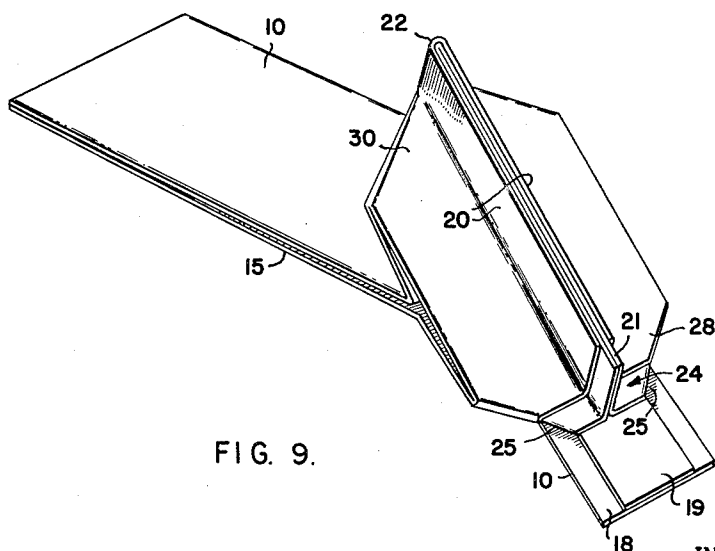


FIG. 9.

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Filed Nov. 9, 1959, Ser. No. 851,637
1 Claim. (Cl. 229—57)

This invention relates to bags and, more particularly, to the formation of the bottom of a bag having a heat-sealable liner and of the automatic or self-opening bottom type.

It is the general object of this invention to effectively seal the bottom of a bag of the indicated type so that the contents of the bag will be protected against loss or deterioration by reason of sifting or breathing through openings in the seal.

Another object of the invention is to provide a bag of the indicated type which may be economically manufactured at a high production speed.

The above and other objects and features of the invention will become apparent from a consideration of the following description taken in connection with the accompanying drawings wherein:

FIGURE 1 is a perspective view of a tube from which the bag embodying the present invention may be made;

FIGURE 2 is a bottom view of the embodiment shown in FIGURE 1 illustrating a step in the formation of the bottom of the bag;

FIGURE 3 is a plan view illustrating a subsequent step in the formation of the bottom of the bag;

FIGURE 4 is an enlarged section taken on line 4—4 of FIGURE 3;

FIGURE 5 is a plan view illustrating a further step in the formation of the bottom of the bag;

FIGURE 6 is an enlarged section taken on line 6—6 of FIGURE 5;

FIGURE 7 is a plan view illustrating a still further step in the formation of the bottom of the bag;

FIGURE 8 is a plan view illustrating the bottom of the bag in its completed form; and

FIGURE 9 is a perspective view illustrating the formation of the bottom of the bag at the stage shown in FIGURE 3.

Referring to the drawings, the bag of the present invention, which is similar to that disclosed in U.S. Patent No. 2,496,796 to E. S. Kardon but is an improvement thereover, comprises an outer sheet 10, which may be made of paper or another suitable material, and an inner lining 12, which may be made of an impervious, heat-sealable material so that the bag may be sealed against outside air and moisture by heat sealing the lining in a manner to be hereinafter described. In the preferred embodiment, inner lining 12 is made of a separate sheet of heat-sealable material so that the abutting faces of the lining may be caused to adhere to each other upon the application of heat thereto. However, it is to be noted that the sealing may be effected by the application of an adhesive at the desired places to cause the lining faces to adhere to each other at such places.

The bag of this invention is made from an intucked, flat bag tube such as the one shown in FIGURE 1 and which may be made by one of the automatic bag making machines well known in the art. When the tube is made, lining 12 is loosely nested within and separated from outer sheet 10 at the end of the tube from which the bag bottom is formed (the right end as viewed in the drawings) and is "tacked" to the outer sheet 10 at transverse adhesive lines along the tube.

As shown in FIGURE 2, a pair of parallel spaced slits 14 is formed in outer sheet 10 at the bottom end of one

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side 15 of the tube. Slits 14 extend longitudinally from the bottom edge of the tube and are spaced equidistantly from the longitudinal edges of side 15. A pair of spaced parallel slits 16 are also formed in lining 12 at the bottom end of side 15. Slits 16 extend longitudinally from the bottom edge of the tube and are equidistantly spaced from slits 14. Slits 16 are inwardly of slits 14 and extend from the bottom edge of the tube in an amount less than slits 14. Slits 14 define a tab portion 18 in a portion of the outer sheet 10 of side 15 and slits 16 define a tab portion 19 in a portion of the lining 12 of side 15.

The bottom end of the tube is then formed into a diamond fold as shown in FIGURES 3 and 9. The diamond fold of the present invention differs from the usual diamond fold as disclosed in U. S. Patent No. 2,496,796 to E. S. Kardon in that tab portions 18 and 19 form one end of the fold and in that a pair of upwardly extending flaps 20 are formed in the center of the fold. The outer faces of flaps 20 are comprised of a portion of the outer sheet 10 which has a two-ply thickness of heat-sealable lining 12 therebetween. Flaps 20 are united by a vertical fold 22 which is at the apex of the inner triangle 30 of the diamond fold whereby there will be no opening in this area when the bottom of the bag is sealed as will be hereinafter described.

After the diamond folding operation, a two-ply layer of lining 12 is formed by an overlapping of such material in the region defined by a transverse strip 24 adjacent the inner portion of tab portion 18 between the innermost points of slits 14 and 16. As is best shown in FIGURE 9, during the diamond folding, lining 12 is folded over along lines 25 extending between the innermost points of adjacent slits 14 and 16.

While the bottom of the bag is being folded into the position shown in FIGURES 3 and 9, heat is applied at right angles to flaps 20 as is shown by the arrows in FIGURE 3. The heat is applied in an amount necessary to cause the opposing faces of the portion of lining 12 within flaps 20 to adhere to each other and thereby seal the entire length thereof.

Flaps 20 are then folded to the position shown in FIGURES 5 and 6 and lie flush with the plane of the formed portion of the bag bottom. It will be noted that the portion 21 of lining 12 which extends beyond the four-ply portion of flaps 20 will lie on the two-ply transverse strip 24.

When the bag is in the position shown in FIGURE 5, heat is applied along the transverse strip 24 as is indicated by the transverse line 26, which is located outwardly of the crease line 28 upon which the final fold of the bottom portion will be made whereby the seal is beyond the sifting point. By applying heat along transverse line 26 directly to the heat-sealing lining 12 at transverse strip 24, a quicker and more effective heat sealing results since the heat does not have to penetrate an extra ply of the material forming outer sheet 10.

The triangular portion 30 of the diamond folded bottom is now bent over, as illustrated in FIGURE 7, along the crease line 32 after which the bottom portion 34, with tab 18 extending therefrom, is folded over along the crease line 28 to complete the formation of the bag bottom, as is shown in FIGURE 8.

The tab portions 18 and 19 are caused to adhere to the bottom of the bag by applying a suitable adhesive between the contiguous faces of tab portions 18 and 19 and the triangular portion 30 of the bag bottom structure.

It will thus be apparent that a bag constructed in accordance with the invention will have the bottom portion effectively sealed to prevent any sifting of finely powdered contents through the bottom and to prevent any passage of air or vapor which might tend to deteriorate the contents of the bag.

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It is to be understood that although one embodiment of this invention has been shown and described for purposes of illustration, the invention can be variously embodied and changes may be made in the construction and arrangement of the parts without departing from the scope of the invention as defined by the appended claim.

What is claimed is:

A bag comprising a tubular member having an outer sheet and an inner lining, said inner lining being made of heat-sealable material, said tubular member being collapsible to a flattened condition to form a pair of oppositely disposed walls, a first pair of spaced longitudinal slits in said outer sheet at a portion thereof forming one of said walls, said first slits extending inwardly from the edge of said tubular member from which the bottom of the bag is formed and being spaced from the sides of said one wall to define a tab, a second pair of spaced longitudinal slits in said lining at a portion thereof forming said one wall, said second slits extending inwardly from the bottom edge of said tubular member by an amount less than said first slits and being inwardly of said first slits, a partial diamond fold at the bag bottom having said tab at one end thereof, said partial diamond

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fold forming oppositely disposed flaps at the middle thereof and a double lining layer adjacent the innermost portion of said tab along a transverse strip between the innermost points of said first and second slits, said double lining layer being formed by the portion of said lining between adjacent first and second slits being folded to overlie the portion of said lining lying along said transverse strip, said transverse strip being bounded by lines interconnecting the innermost ends of said first and second slits respectively, means forming a seal along said transverse strip and a seal along said oppositely disposed flaps to thereby seal said inner lining, and means including said tab and the other end of said diamond fold forming the bottom of the bag.

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