

Dec. 10, 1946.

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2,412,501

BAG MANUFACTURE

Filed Dec. 24, 1943

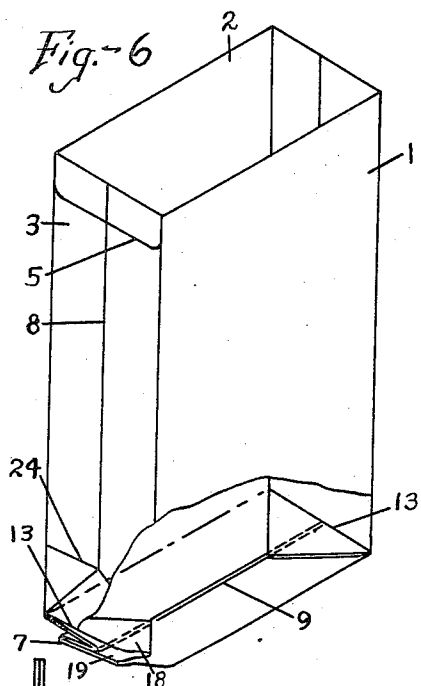
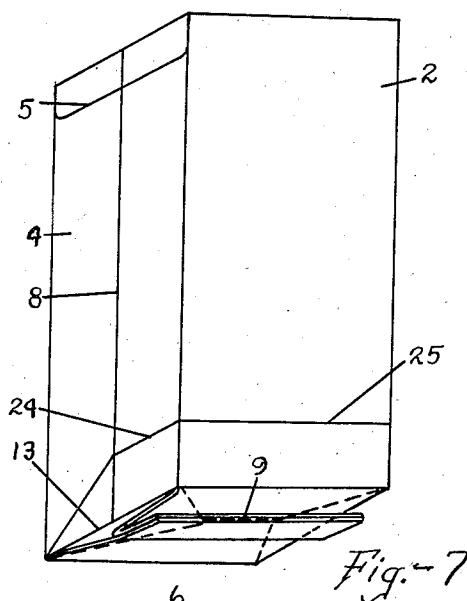


Fig.-1

Fig.-2

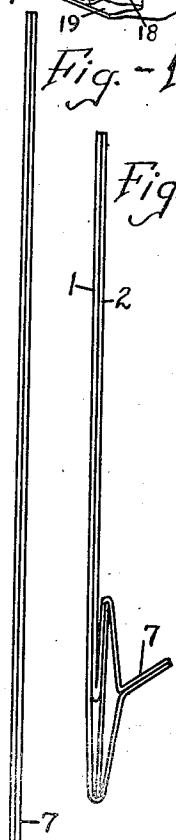
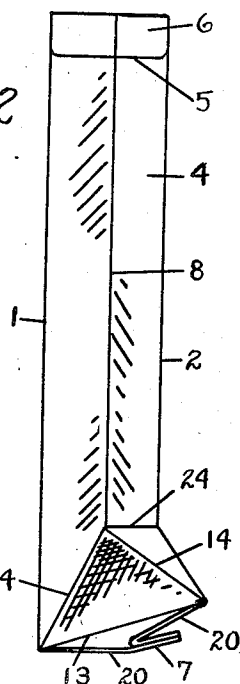


Fig.-3

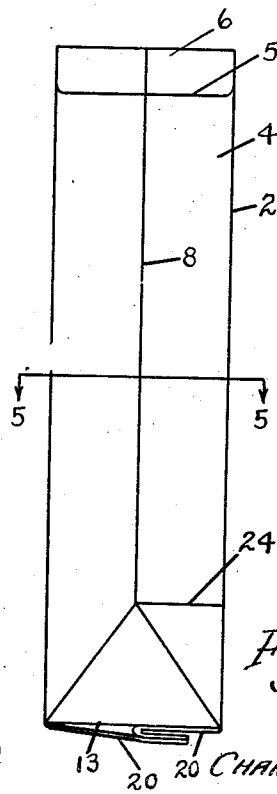


Fig.-4

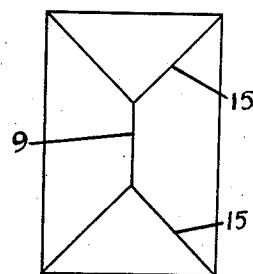


Fig.-5

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2,412,501

BAG MANUFACTURE

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Application December 24, 1943, Serial No. 515,544

2 Claims. (Cl. 93—35)

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This invention relates to a square-bottom bag; that is, one that will stand erect when empty.

For some years there has been on the market a multiple-wall coffee bag composed of paper and rubber hydrochloride film. The paper has been on the outside of the package so that the film forms a liner. The bag is a plicated bag with pleats of uniform width on each side, running from the bottom seam to the open top thereof. A narrow width of the paper coating has been cut away at both the top and bottom edge of each pleat so that when the bag is collapsed and heat is applied, there is no paper between the folds of the rubber hydrochloride at the top and bottom of the bag, and a tight seam may be readily formed by heat and pressure. The drawing illustrates this manner of producing the heat-seal.

The bag of the present invention is an improvement over that bag which has been on the market for several years because that bag is not a square-bottom bag, and the bag of the present invention is a square-bottom bag. It may be made by modifying the bag which has been on the market. It is a multiple-wall bag, the plies being either spot-welded together or united over their entire surface. The inner ply is composed of heat-sealable material. For purposes of illustration, the description will refer more particularly to the use of a laminated sheet. Fig. 1 is a side view of the bag which has been on the market although, ordinarily, the bottom seam of this bag has been folded against the side wall, as is illustrated in Figs. 2 and 4. Fig. 2 is a side view of the completed bag of this invention when collapsed and folded for shipment. Fig. 3 is a side view of the bag of this invention when only partially collapsed. Fig. 4 is a side view of the bag of this invention with the bottom squared out and the bag standing erect on its square bottom. Fig. 5, taken on the line 5—5 of Fig. 4, shows a plan view of the interior of the bag and a section through its walls, Figs. 6 and 7 show different perspective views of the erect bag.

The bag is formed of the front and back 1 and 2 and the plicated sides 3 and 4. These four walls are all laminated sheets composed of rubber hydrochloride film or vinyl chloride-vinylidene chloride copolymer, a polyvinyl derivative, glassine, regenerated cellulose, paper or other suitable sheet material in any desired combination to produce mere moisturetightness or tightness to oxygen or other gas, etc. The outer ply extends the whole length of the front and back walls 1 and 2 but has been cut away from the top edge of the plicated sides 3 and 4. For the

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purpose of illustration, it will be supposed that paper is the outer ply. As illustrated in Figs. 3 and 4, the paper covering of the bag extends only to the line 5, and this exposes the areas 6 of the inner ply which, for the purpose of illustration, will be supposed to be rubber hydrochloride film. When the bag is collapsed, the outer surfaces of these areas 6 are brought together, and when heat and pressure are applied, these outer surfaces of the film coalesce; and these portions of the film also coalesce with the rubber hydrochloride lining on the front and back walls of the bag. This forms a flat heat-seal. The bottom seal of the bag, which is folded over at 7, is made in this way, and a similar seal will be formed at the top of the bag after the bag is filled and the top is collapsed.

The bag is made of a tube of rubber hydrochloride film laminated with paper, with the small areas 6 of the paper cut away as indicated. This tube is run through a plicating machine to form the pleats on each side, and it is then run through a pair of rollers to crease the paper and film and flatten the tube out as shown in the side view illustrated in Fig. 1. The front and back faces are indicated by the numerals 1 and 2, and each of the plicated sides 3 and 4 is divided down the middle by the fold 8. The bottom edges of the tube are united by heat and pressure to form the seam 7, which is advantageously bent over and glued to one of the sides of the bag, as illustrated in Fig. 4. The inner edges of the folds 8 of the side walls do not necessarily come together at the center of the bag when it is folded flat, and there may be some little distance between them, such as the distance indicated by the seam or fold 9 in Fig. 5. The length of the line as shown in Fig. 5 indicates the distance between the folded edges 8 of the two pleats in the side walls of the bag when the bag is collapsed, as shown in Fig. 1.

If this bag is opened up by merely filling it with material, it will have a somewhat rounded bottom and will not stand squarely erect. It cannot be made to stand at all before it is filled. This has been an objection to this type of bag. According to this invention, a square bottom is formed into a bag which has been formed from a pleated tube in the manner described. If this is done by machinery, pairs of fingers will grip the bag along the bottom edges 20 of the plicated sides adjacent the seam 7. Certain of the fingers will press against the bottoms of the front and back walls 1 and 2, and the opposing fingers will push in the bottoms of the plicated sides, and

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these plicated sides will be squared up with the bottom edges 13 of the squared-up portions eventually lying against the flattened portions of the bottoms of the side walls which form the outside bottom of the bag, as shown in Fig. 4. The fingers should grab the bag as it is being opened, perhaps when it is in the position shown in Fig. 3. Air might be blown into the open mouth of the bag to assist in this gripping operation. The effect of squaring up the side walls is illustrated in Figs. 5, 6, and 7.

Looking down into the mouth of the opened bag (Fig. 6), we see the plicated walls 3 and 4 squared up. We also see the lines 13 straightened out, and we also see on the bottom of the bag the line 9. If the seam 7 is not folded over, this line 9 is the seam. If the seam is folded, the line 9 is the fold. We also see the lines 15, which connect the four corners of the bag to the ends of the line 9. These lines 15 are the inner edges of folds which form in the bag as the plicated walls are squared up. They form the equilateral sides of two right isosceles triangles 18 and 19 (Fig. 6). The base of the triangle 18 is the fold 13. The base of the other triangle 19 is the straight line formed by the two bottom sections 20 of the outside edges of the bag. When the bag is flattened as in Fig. 1, the plicated walls 3 and 4, of which the triangles form a part, flatten out, and the triangles disappear. The triangles are shown in a formative state in Fig. 5: the line 13 is doubled up somewhat and is not shown at full length as it is in Fig. 4.

When the bag is squared up as shown in Figs. 4, 6, and 7, the folds 13 become the bottom edges of the squared-up portion of the bag and form triangles with the lines 15, as explained. The side walls above the lines 13 are then perfectly flat and rise vertically from the edges 13. The bottom edges of the walls 1 and 2, which are indicated by the numeral 20, are the same length as the folds 13 (although Fig. 3 is deceiving in this respect because the fold 13 is not straightened out), and when the bag is squared up, the folds 13 and edges 20 coincide as shown in Fig. 4. They then form the bases of the isosceles triangles described.

After the bag has been squared up in this fashion, as the final step in its manufacture, it is advantageously folded flat, as shown in Fig. 2, and stored or shipped in this condition. In folding flat, creases 24 are formed in both sides of the bag, and the crease 25 is made across the front. When it arrives at its destination and is to be filled, it may be easily squared up by grasping an upper edge and giving the bag a shake as the grocery man or candy man has done with flat-bottom bags from time immemorial. When squared up in this manner, the bag will stand

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upright on a conveyer belt or other platform, ready to be filled.

A chief advantage of this square-bottom bag is the fact that all the seams in its interior are formed by contacting surfaces of rubber hydrochloride, and the seams have been made by heat-sealing and are perfectly tight. The entire inner surface of the bag is formed of a lining of rubber hydrochloride.

What I claim is:

1. The method of forming a square-bottom bag which comprises flattening a section of a tube of multiple-wall bag material to form plicated sides and a front and back wall, the inner ply being composed of heat-sealable material; heat-sealing opposite inner surfaces of the inner ply at one end of the flattened section in a single straight-line seam to produce a bag; and then, after separating the front and back walls thus formed, pushing in the bottom portion of each plicated side to form three congruent isosceles triangles into it, one apex of each of the triangles lying in the fold which divides the plicated wall in two, and while pushing the side walls of the bag in, forming folds which pass through the four bottom corners of the bag and said apexes, and making an outward fold in each side wall to define a side of the upper two triangles in each side wall opposite said apexes; and where these outward folds meet the front and back walls of the tube, folding the front and back walls to define a rectangular bottom for the bag and simultaneously folding the entire bottom of the bag upwardly along a horizontal line across the front of the bag a distance from the bottom edge of the front wall of the bag equal to one half the base of said triangles.

2. The method of making a collapsed, square-bottom bag from a rectangular bag formed from a flattened tube with plicated sides and a straight seam across the bottom, which consists in (1) folding a pair of isosceles triangles into the bottom of each of the plicated sides by pushing in the bottoms of said sides and thereby forming a square bottom in the bag, in each pair of triangles the apexes and two sides joining said apexes being defined by folds dissecting the four corners at the bottom of the bag and (2) collapsing the bag by (a) forming a third triangle on each side wall congruent with the other triangles and with its base coinciding with the base of the upper of the two aforesaid triangles and making an outward fold along said base in each side wall, and by (b) doubling the bottom of the front of the bag along a line which is spaced from the bottom edge of the front wall a distance equal to half the base of each of the triangles, thereby collapsing the bag to a substantially flat condition.

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