

July 16, 1957

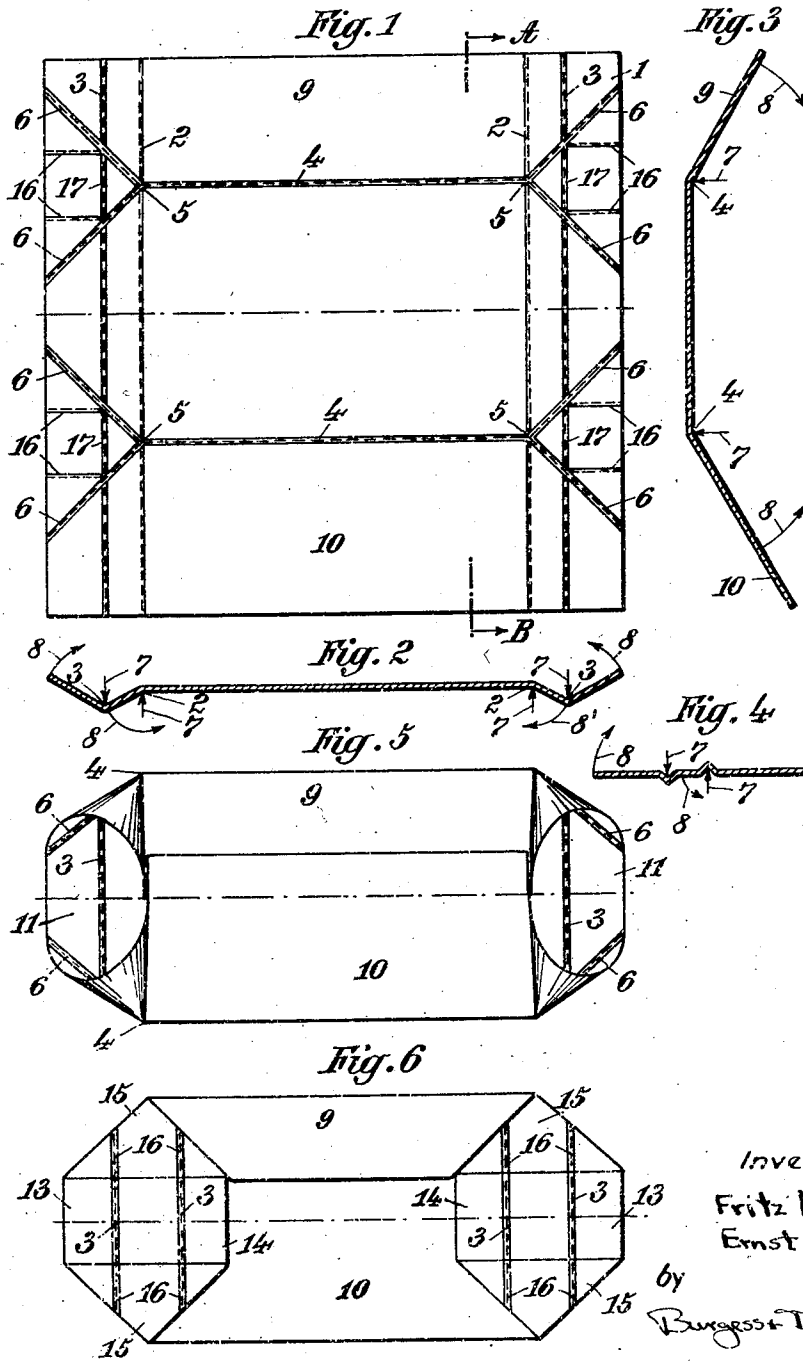
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PAPER BAGS

Filed March 17, 1957

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

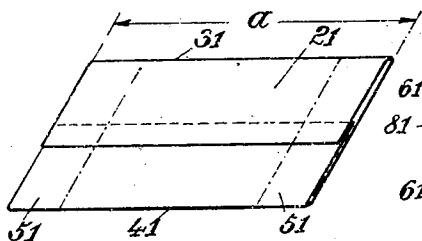


Fig. 7

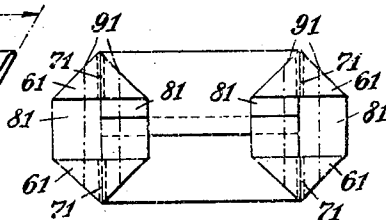


Fig. 8

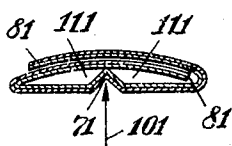


Fig. 9

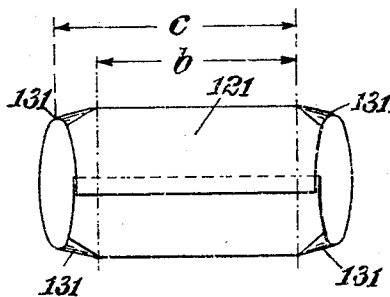


Fig. 10

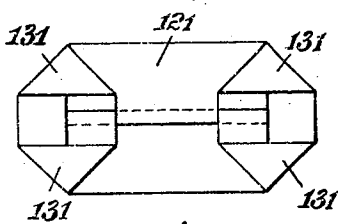


Fig. 11

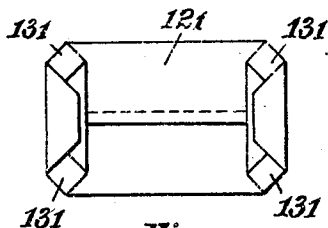


Fig. 12

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This invention relates to improvements in paper bags. Paper bags are conventionally manufactured by first preparing a bag tube which is folded on both sides and provided with a glued longitudinal seam. The ends of the bag tube are then formed into bag bottoms. A bag bottom is formed at each end of the tube when a valve bag is being manufactured and a bag bottom is formed at only one end of the bag tube when an open bag is being manufactured.

Bag bottoms are formed by first turning over and folding the bag bottom flaps and then closing the bag bottom by turning over its side flaps.

The finished paper bags manufactured in this manner have crease folds in their bag bottom corner flaps caused by the longitudinal folding in the formation of the bag tubes since the tubes are folded over their over-all length.

Due to these crease folds in the bag bottom corner flaps the finished bag bottoms have so-called air channels which allow leakage of material which is packed in the bag. This is particularly true when the bag is filled with powder or granular materials since this material can easily escape from the bag through these air channels. These air channels are particularly undesirable when the bag is to be filled on the filling nozzle of a bag filling machine as the air pressure in the bag is especially great at the upper corner of the bag opposite the bag valve and material may easily escape from this portion.

These air channels in the corner flaps of the bag bottom are greatly increased because the crease folds in the corner flaps of the bag bottom bulge out when the bag bottom is closed by the turning over of its side flaps so that the corner flaps of the bag bottom do not lie smooth when they are pasted with the bag bottom side flaps and retain their uneven position even after they are formed into finished bag bottoms. When the paper bags are constructed from paper consisting of several layers, these crease folds are particularly disadvantageous because they cause great unevenness in the corner flaps of the bag bottom and thus bring about the aforementioned leaks.

One object of this invention is a paper bag without the aforementioned disadvantages.

A further object of this invention is a blank which may easily be folded into an improved paper bag. This and further objects will become apparent from the following description read in conjunction with the drawings in which:

Fig. 1 shows a piece of paper, used for the formation of a paper bag, grooved at the bag folding lines;

Fig. 2 is an end view of the piece of paper showing the direction of bend in accordance with the folding process;

Fig. 3 is a section along line A—B of Fig. 1, showing the direction of bend in accordance with folding process;

Fig. 4 is one form of embodiment of the grooves;

Fig. 5 is the piece of paper which is developed in a

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tube shape in the vicinity of the bag wall to be formed showing the spread-open bottom parts of the bag;

Fig. 6 is the paper bag with its bottom still open;

Fig. 7 shows a perspective of a bag tube folded on both sides;

Fig. 8 shows a top elevation of the bag tube of Fig. 1 with bag bottom corner flaps which have crease folds caused by the longitudinal folding of the bag tube;

Fig. 9 shows diagrammatically the bulging out of the crease folds in the corner flaps of the bag bottom upon the folding over of the bottom side flaps, on an enlarged scale;

Fig. 10 shows paper bag tube formed according to the invention.

Fig. 11 shows the tube shown in Fig. 10 with the bag bottom corner flaps which do not have any crease fold; and

Fig. 12 shows a finished valve bag, the corner flaps of which are free from crease folds.

In accordance with the invention a paper bag is formed in which the corner flaps of the bag bottom are so developed that they do not have any crease folds caused by the longitudinal folding or scoring of the bag tube.

The paper bag is formed from a blank which has predetermined bag fold lines for forming a bag 2. These lines extend only over the length which is to be the bag wall portion and do not extend to the bag bottom portion. When the bag 2 is formed from this blank, the bag bottom portion automatically spreads open and may be easily combined to form the bag bottom.

With this new blank, paper bags can be manufactured much more simply and rapidly than was heretofore known, inasmuch as now it is not necessary to first of all form a bag tube of the known kind, the gluing seam of which must be dry before the bottoms can be formed. Also, the opening of the bag tube ends, in order to form the bottom, is no longer necessary so that the complicated devices formerly used for this purpose, for example suction devices, are no longer needed. In addition to this, the bag bottom ends, in accordance with the new method, are spread apart much more uniformly than in accordance with the old method so that the finished bag bottoms are much more uniform in appearance than those previously made, and finally the corner folds of the bag bottoms no longer receive bent lines during the formation of the bag tubes which, when produced in accordance with the known methods, appear in their center, and run parallel to the folding lines of the bottom side flaps and weaken the bag wall there and at the bag ends.

Referring to Fig. 1 of the drawing, the paper 1 serving for the formation of a paper bag, is provided on both sides with both an individual longitudinal folding line 2 and a longitudinal folding line 3. Between the two folding lines 2, there extend the transverse folding lines 4. At points 5, the transverse folding lines 4 come against the longitudinal folding lines 2. From points 5, bottom folding lines 6 branch out. All of these bag folding lines are scored in accordance with the folding process, i. e. the scores are provided in the manner that they favor the turning over of the individual bag parts in their pertinent direction of bend during the bag folding, as can be seen diagrammatically in Figs. 2 and 3.

If the piece of paper 1 during the scoring is pressed in, in the direction of the small straight arrow 7, the direction of bend then lies in the direction of the arc-shaped arrows 8 so that the folding procedure in the direction of these arrows 8 is facilitated. During the folding of the bag, the individual parts of the bag which are to be folded over are easily folded over in the directions indicated by the arrows.

The form of the scores can be varied; for example, they can be developed in the manner shown in Fig. 4

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in the drawing. The form of the scores is selected to fit each individual case, depending on the strength of the piece of paper serving for the formation of the paper bag and also depending upon the nature of the material which is to be used for the manufacture of the bag. The piece of paper 1 serving for the formation of the paper bag, may consist as is known of several layers, the edges of which can be staggered with respect to each other.

The scored piece of paper lies then formed in the region of the bag wall which is to be formed into the shape of a flat tube as can be noted from Figure 5 of the drawing. Parts 9 and 10 of the piece of paper 1 are only grasped in the region lying between the longitudinal folding lines 2, folded along the transverse fold lines 4 and pasted together in the known manner.

By the folding of parts 9 and 10, are the bag bottom parts 11 produced which spread open by themselves so that it is unnecessary to open these parts by a special operation in the formation of the bottom.

The spread bag bottom parts 11 can easily be combined with each other to form bag bottoms, inasmuch as it is generally not difficult to fold the bottom flaps 13 and 14 over, along the folding lines 3, even if the corner flaps 15 are not scored along folding lines 16.

If, however, the piece of paper 1 serving for the formation of the paper bag is particularly difficult to bend, as for example, when it consists of several layers, it should in such cases also be scored along the folding lines 16 so that the corner flaps 15 do not offer any appreciable resistance to the turning over of side flaps 13 and 14. The short paths 17 of folding lines 3 also need not be scored if the paper is easily folded over.

Referring to Fig. 7, a bag tube 21, as conventionally used in the manufacture of paper bags, is shown. The tube has the crease folds 31 and 41 over its entire length a .

If the bottom corner flaps 6 as shown in Fig. 8 are formed on the ends 51, 51 of this bag tube 21 in order to form a bag bottom, each of these bag bottom corner flaps has a crease fold 71. Upon further formation of the bag bottom the bag bottom side flaps 81 are turned over along the scored lines 91 so as to close the bag bottom.

In this process the crease folds assume a bulged out position as shown in an enlarged scale in Fig. 9 in the direction of the arrow 101. On both sides of the crease fold 71 air channels 111 are produced. These air channels derive their name because air escapes out through them carrying along some of the material with which the bag is filled.

Fig. 10 shows a bottom tube formed according to the invention. The folded together tube 121 has folds extending along its longitudinal length over the distance b . The corner flaps 131 which must be turned over to form the bag bottom are not folded nor scored so that they do not have any crease folds after they have been scored in the manner shown in Fig. 11. The finished valve bag shown in Fig. 12 thus does not have any crease folds caused by the longitudinal folding or scoring of the bag 21.

If the piece of paper 121 is formed so as to produce an open bag, it is folded on both sides over a distance c (as shown in Fig. 4) so that the bag bottom corner flaps are without creases at the end where the bag bottom is to be formed.

By forming the corner flaps of the bag bottoms without any crease folds these flaps remain smooth and lose their tendency to bulge out on the turning over of the side flaps of the bag bottom and no disadvantageous air channels are formed. Thus the glued finished bag corners and the paper bags are tighter and stronger.

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The bag is formed according to the invention by forming a bag tube which is scored and folded in the bag body portion, but has no scores or fold marks at the portion which is to become the bag bottom.

It can thus be seen that the invention lies in a paper bag and a blank for forming the same in which the longitudinal folds for forming the paper bag tube do not extend through the bag bottom but only extend to where the bag bottom corner flaps will be formed. If the bag tube is formed by first scoring the paper and then folding it, the score marks should only extend this distance.

We claim:

1. A blank foldable into a paper bag which comprises at least one substantially rectangular sheet of paper defining a bag wall portion and at least one terminal bag end portion and two first folding lines established by scoring the paper on said bag wall portion of such paper terminating at the beginning of said terminal bag end portions, said first folding lines being positioned so that the shortest distance between said first folding lines at any point is less than the sum of the shortest distances between each said first folding line and the closest respective paper edge thereto.

2. Blank according to claim 1 in which at least one 2nd folding line is established by scoring the paper, said 2nd folding line being in said bag bottom portion and positioned to run at substantially right angles to said first folding lines.

3. Blank according to claim 2 in which at least one pair of 3rd and 4th, and at least one pair of 5th and 6th folding lines are established by scoring the paper, said 3rd and 4th folding lines contacting each other at an angle, of about 90° therebetween, said contact occurring at at least one end of one of said first folding lines, said 3rd and 4th folding lines, being positioned to contact the closest edge of such paper in the direction of said first folding line, thereby forming a substantially isosceles triangle with the said edge of such paper, said paper edge being the hypotenuse of said triangle, said 5th and 6th folding lines contacting each other at an angle of about 90° therebetween, said contact occurring at at least one of the corresponding ends of the other of said first folding lines, said 5th and 6th folding lines being positioned to contact the same edge of such paper as said corresponding 3rd and 4th folding lines, thereby forming a substantially isosceles triangle with the said edge of such paper, said edge being the hypotenuse thereof.

4. Blank according to claim 3 in which there is established by scoring the paper at least one 7th folding line, said 7th folding line passing through the entire width of the paper being positioned to fold such paper in the opposite direction to said other folding lines, and to contact both said first folding lines at the same ends thereof.

5. Blank according to claim 4 in which there are included additional folding lines established by scoring the paper positioned within said triangles at the shortest distance between the contact points of said 3rd, 4th, 5th and 6th folding lines with said 2nd folding line, and the nearest edge of such paper, said additional folding lines being positioned to fold such paper in substantially the same direction as said 7th folding line.

References Cited in the file of this patent

UNITED STATES PATENTS

670,507	Diem	Mar. 26, 1901
717,621	Read	Jan. 6, 1903
904,167	Widmer	Nov. 17, 1908
1,821,207	Cornell	Sept. 1, 1931
1,853,105	Weissshuhn	Apr. 12, 1932