

July 16, 1929.

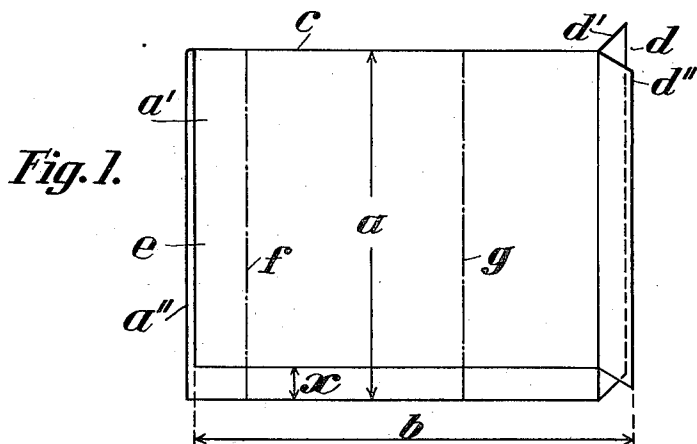
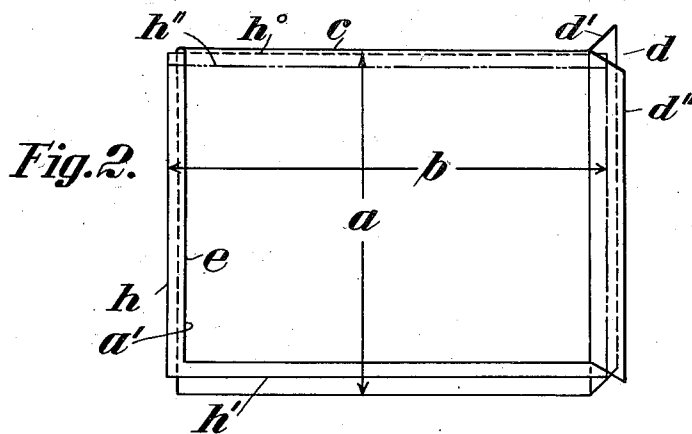
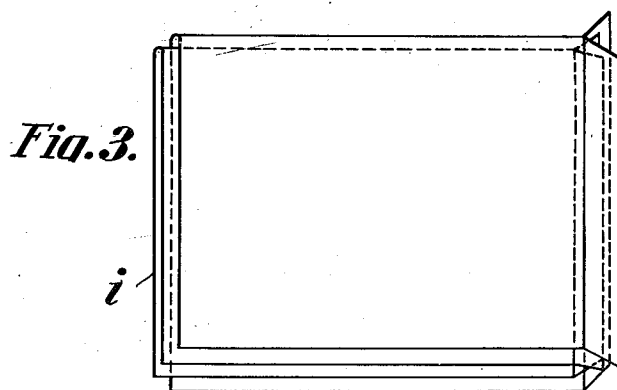
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1,721,399

METHOD OF MANUFACTURE OF BAGS

Filed Feb. 3, 1928

3 Sheets-Sheet 1



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Fig. 4.

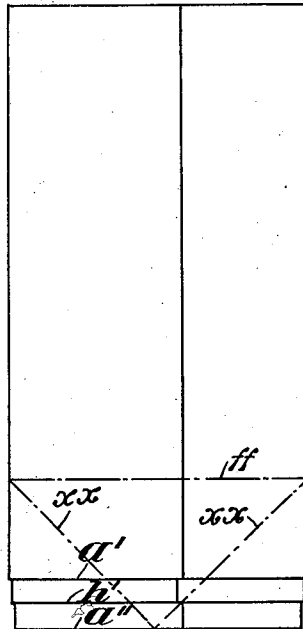
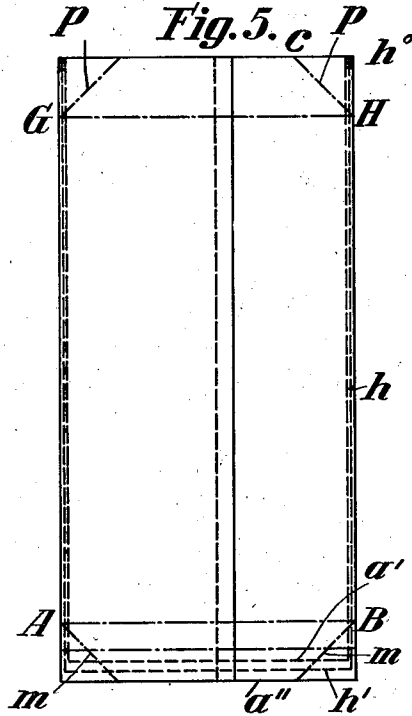


Fig. 7.

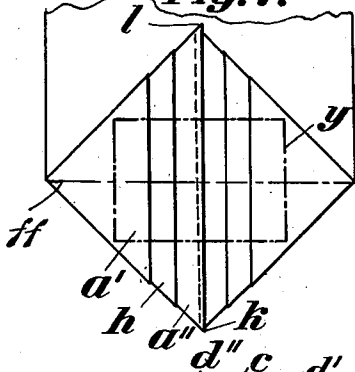


Fig. 8.

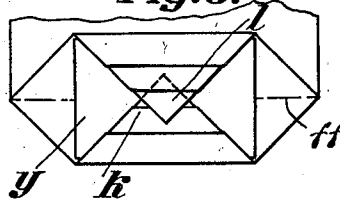


Fig. 9.

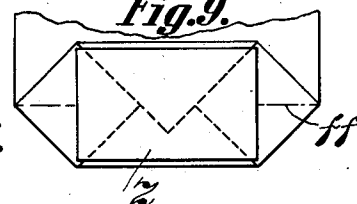
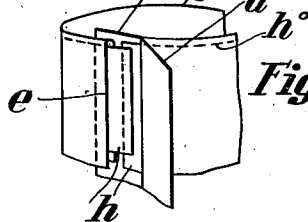


Fig. 6.

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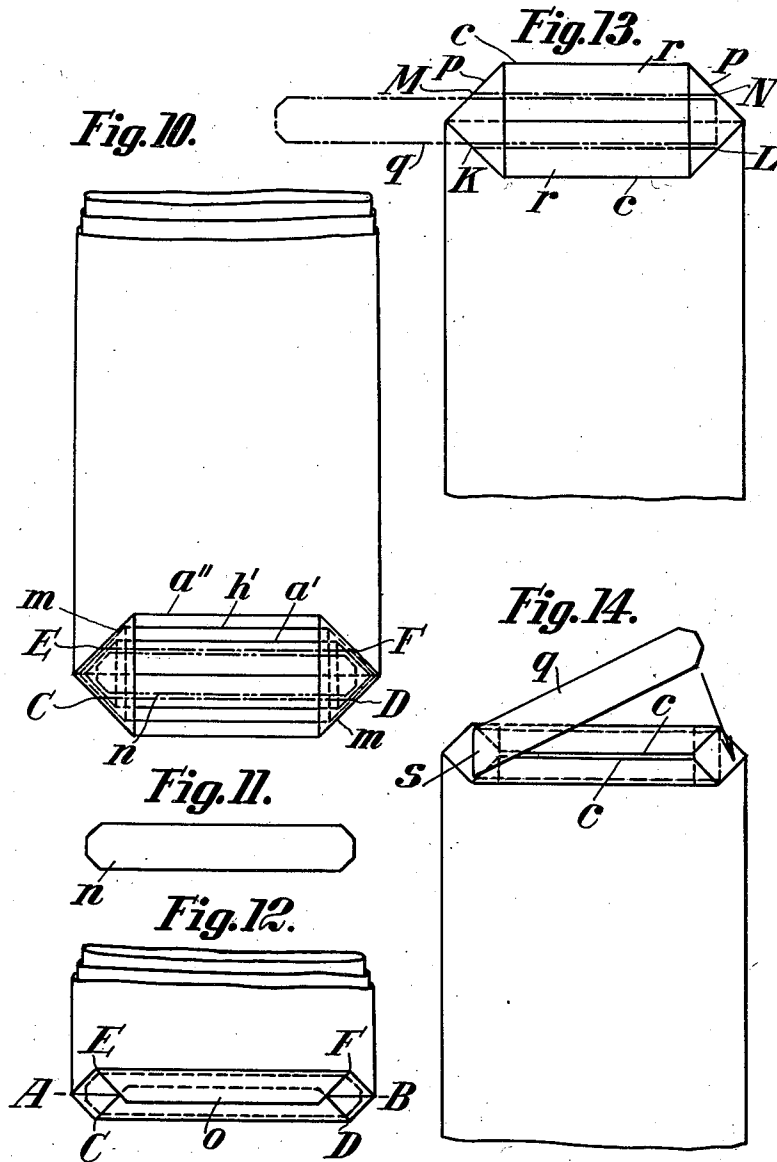
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METHOD OF MANUFACTURE OF BAGS

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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METHOD OF MANUFACTURE OF BAGS.

Application filed February 3, 1928, Serial No. 251,692, and in Germany October 24, 1925.

This invention relates to methods of manufacturing bags or sacks made of paper or similar material and more especially of bags formed from a plurality of layers. It aims to provide a construction whereby the manufacture is simplified and cheapened while at the same time the formation of a specially resistant bottom is made possible.

It is customary to manufacture bags with double or multiple layers of paper by laying up one sheet after another separately around a "former". In this manner of manufacturing, the inner sheet must be drawn forward a little by hand at the side of the bag where the contents are to be inserted so that its edge projects beyond that of the outer sheet or sheets. The projecting edge must then be turned over to the outside and pasted in order to ensure that the upper edge is not damaged on inserting the contents or that the goods are not wrongly inserted.

This invention embodies an improved method of manufacturing paper bags. According to the invention, inner and outer layers are formed from a single sheet turned over on the insertion side to a folded edge, and between these two layers there are inserted additional sheets in the case of bags to be made of more than two layers either as single sheets or as sheets also connected together by a folded edge, whereupon they may be pasted. At one side, the fold is cut open to the width required for the formation of the adhesive seam, and between the flaps formed by such cutting, the oppositely located edge is pushed in by folding together into a tube.

This method is hereinafter explained with reference to the partly diagrammatic drawings, which illustrate the manufacture of double and multiple bags, as well as the formation of specially strong bottoms and an insertion flap on one side of the bag.

Fig. 1 illustrates a folded strip for making the bag, the two layers of which constitute the inner and outer sheet in the case of a double walled bag and the inmost and outmost layer in the case of a multi-walled bag.

Fig. 2 illustrates the arrangement of the sheets for a bag of three layers and Fig. 3 illustrates the arrangement of the sheets for a bag of four layers, prior to their being shaped into a flat paper tube.

Figs. 4 and 5 respectively illustrate in two

different constructions, the manner in which the sheets are folded and glued to form paper tubes for a bag with three layers for example, by using the arrangement of sheets according to Fig. 2.

Fig. 6 illustrates the manner of attaching the flap portions together in a longitudinal seam to form the tubes shown in Figs. 4 and 5.

Figs. 7 to 9 show various stages of forming the bottom for the bag to be made from the tube of Fig. 4.

Figs. 10 to 12 show a different form of bottom construction for the bag to be made from the tube of Fig. 5.

Figs. 13 and 14 show the manner of providing an insertion flap in the bottom of the bag.

All the figures are in plan or side elevation and somewhat diagrammatic.

In making a double bag, the paper sheet used should be of a width about twice the length a of the bag tube. This paper sheet is cut up into lengths b (see Fig. 1) of about double the width of the bag to be made, plus the width of a double seam. The sheet is folded along a fold-line c as represented in Fig. 1, so that a double piece of width b is produced, one of which lying over the other in position a' is shorter by a piece e than said other occupying position a'' , and the length of which is indicated by a .

The fold c is slit at one end as represented at d for an extent corresponding with the desired width of the seam of the bag to be pasted, so as to provide two flaps d' and d'' . This doubled sheet of Fig. 1 may be formed on a machine by feeding a paper strip from a roll of the width $2a$, folding over at c with the help of folding devices, and cutting the same into lengths b , the short slits d at the fold c being formed at the same time. At the place where the fold c is formed, the paper may be slightly perforated.

The double sheet is now formed into a tube, either by pasting the inner surfaces or edges of the folded sheets between the two flaps d' and d'' or the opposite end e of the piece on both sides with adhesive, slipping the end e between the two flaps d' and d'' and pressing down the two flaps. In machine manufacture impressions may be applied by well known means such as folding knives along the dotted lines f, g before or during the cutting of the paper band into the lengths b .

In the way hereinafter explained for the manufacture of triple bags, the folding over into a tube can take place in such manner that the longer layer a'' forms either the inner or outer layer of the bag.

In the manufacture of a three-fold bag, a third sheet h of the same width b is inserted in the doubled sheet of Fig. 1, the lower edge h' thereof being made to lie approximately in the middle between the edges of the layers a' and a'' so that a stepped graduation of the edges is presented as shown in Fig. 2. The upper edge h'' of the sheet h may extend up to the folded edge c and there stuck down by a narrow adhesive strip, especially if a flap bag is to be made. In some cases the sheet may be shortened somewhat on the side of the fold c in the way indicated by the double dotted line h'' .

The inserted sheet h may be drawn out at the side of the edge e for about half the extent of the slit d , which then takes up the double width of the pasting seam. The formation of the seam is then completed as above described for a double bag. This formation is illustrated even more clearly in Fig. 6. It will be seen that not only the edge e is stuck in between the two flaps d' and d'' , but that also the edge of the sheet h parallel to e is stuck fast on both sides to the flaps d' , d'' . This triple tube can also be formed from lengths b drawn off a roll, cut off and previously provided with impressions determining the later folding edges by machine. The sticking together in tube form may be done mechanically in the way already described for the double tube, either according to Fig. 4 so that the layer a' lies outside whilst the inner layers h and a'' project outwardly in step formation, or in such manner that the layer a' lies inside as indicated in Fig. 5, so that the edges recede in step formation inside the tube.

The manner of forming a quadruple bag will be understood readily upon reference to Fig. 3. The only difference is that the inner insertion consists of a doubled sheet i arranged so that a similar step formation of edges is presented at the lower end of the sheets. The bag tube formed therefrom would exhibit the layers in step formation outwardly or inwardly as in the case of the triple layer tube of Figs. 4 and 5.

Two ways of making bottoms for and from bag tubes formed in the above described manner are illustrated by way of example, using the triple bag tube of Figs. 4 and 5 as a model.

For making the bottom from the tube of Fig. 4, the lower end of the tube is first folded on the line ff and triangular folds or flaps are then formed by folding oppositely on the lines xx producing a rectangular bottom fold as represented in Fig. 7, so that the edges of the layer a'' projecting towards the longitudinal

center plane of the bag will slightly overlap. Then a piece y , preferably of stout paper, is adhesively applied as indicated by the dot and dash lines in Fig. 7, which piece overlies all the layers of the bag. Subsequently, the free corners k and l are turned over and glued down along the edge of the piece of paper y , as represented in Fig. 8, while finally, as shown in Fig. 9, a closing piece z of stout paper is applied over all. It will be observed that the two pieces y and z are stuck to all the layers of the multiple bag and that the work of making the bottom including the gluing down of the strips can be carried out also by machinery.

For making the bottom from the tube of Fig. 5 wherein the shortest layer a' lies inside and the longer layer a'' outside, the following method is preferably adopted. Triangular folds or flaps m are formed to the folding line A—B at both edges of the tube. Then a stout paper strip n of the shape illustrated in Fig. 11 is covered with paste and stuck over the flaps m as indicated by dot and dash lines in Fig. 10, wherein it is shown in glued down position near the edges of the layers stepped inwardly. Thereafter, the turned over portions are folded downwardly over the lines C—D and E—F and glued to the strip n , one of said portions (in this instance the one folded over the line E—F) being coated with adhesive on its underside so that its edge o will be glued firmly to the bottom, (see Fig. 12).

The upper end of Fig. 5 and Figs. 13 and 14 illustrate the formation of a filling in valve bottom suitable also for the tube of Fig. 4 or Figs. 7 to 9. In order to form this bottom, triangular flaps p , p are formed to the folding line G—H. Then a closure strip q of approximately twice the width of the formed tube is pushed under the flap p on one side as indicated by the double dot dash line in Fig. 13. The flap-shaped portions r , r are then turned over along the fold lines K—L and M—N and pasted down as represented in Fig. 14. The width of the strip q is such that the two folding edges c of the flap portions r , r meet without overlapping each other. Thereafter, the outward extending part of the closure strip q is folded down as indicated by the arrow in Fig. 14 and glued to place. Said strip reinforces the seam at the bottom and forms a prolonged filling tube as indicated at s in Fig. 14, so that a secure closure is ensured. When such a filling in valve bottom is to be made, it is expedient as above mentioned to insert the upper edge h'' of the intermediate layer up to the fold c and to fasten it by a narrow adhesive strip. In some instances, instead of the folded strip q there may be used two separate strips of half its length to be glued to each other.

Having now particularly described and ascertained the nature of my said invention and

in what manner the same is to be performed, I declare that what I claim is:—

1. The method of manufacturing bags from sheet material in two or more layers united along a longitudinal seam, characterized by folding or doubling one of the sheets to form the inmost and outmost layers and inserting other sheets therebetween with the fold of said inmost and outmost layers located along the upper end, cutting said fold slightly at one side or corner to provide flaps along a longitudinal margin of the bag under formation, pasting the edges of the layers along the opposite margin between said flaps to form a tube, which may thereafter be flattened by folding on intermediate longitudinal lines, and forming a bottom by folding and uniting the bottom end-portions of the flattened tube, substantially as described.

2. The method of manufacturing paper bags according to the preceding claim, characterized by the fact that additional layers of paper inserted between the folded inmost and outmost layers are of a length equal to the circumference of the tube and are displaced laterally from the incised fold by substantially one-half the width of the adhesive seam.

3. The method of manufacturing paper bags according to claim 1, characterized by the fact that the intermediate layers are cut, folded and inserted in such relation that they are of different lengths in step-like arrangement longitudinally of the tube under formation, such arrangement being made either inwardly or outwardly of the tube with the folded inmost and outmost layers providing the length extremes.

4. The method of manufacturing paper bags according to claim 1, characterized by the fact that the inserted sheets are brought nearly up to the fold of the outmost and inmost layers and are fastened down by a narrow adhesive strip of paper.

5. The method of manufacturing paper bags according to claim 1, characterized by the fact that the inserted sheets are shortened at the side of the fold uniting the outmost and inmost layer.

6. In the manufacture of paper bags according to claim 1, the method of forming a bottom for and from the paper tube formed with layers in step-like arrangement outwardly, which consists in forming triangular flaps from the opposed longitudinal edges to points midway of the width of the tube, pasting a rectangular piece of paper across the flaps thus formed and made to overlap transversely of the tube bottom, and then folding and pasting the two corners of the bottom square of the tube over the longitudinal edges of the paper piece pasted thereacross, whereupon a rectangular closure member may be pasted thereover.

7. The method of forming a bottom from a paper bag tube manufactured according to claim 1 with several layers in step-like arrangement, characterized by the fact that an insertion piece of stout paper is introduced into a satchel bottom formed in the usual way, to which piece the edges of the several stepped layers are stuck.

8. The method of forming a satchel bottom for a paper bag tube of several thicknesses manufactured according to claim 1, characterized by the fact that two overlying flaps for the satchel bottom are made in the usual way and are pasted in between two layers of a double closure strip of suitable width, said strip being of a length equal to double the width of the bag and formed by a single piece folded over itself.

9. The method of manufacturing bags with sides of a plurality of layers of sheet material, which consists in transversely folding one of the sheets and inserting the other therebetween, forming the layers of folded material into a tube having its axis perpendicular to the fold by securing the free edges of the folded sheet between flaps formed along one edge by slitting a portion of the fold, thereby forming a longitudinal seam and closing the tube at the end opposite the fold.

10. The method of manufacturing bags with sides of more than two layers of sheet material, which consists in transversely folding one of the sheets, inserting therebetween the folded layers of another folded sheet of a width approximately equalling the circumference of the bag tube to be formed with its longitudinal edges displaced laterally from the longitudinal edges of the folded sheet, forming the sheets so assembled into a flat tube and closing one end of the tube by folding and pasting together portions of the bottom thereof.

11. The method of manufacturing bags with sides of a plurality of layers of sheet material, which consists in transversely folding one sheet of a length substantially double the length of the bag to be formed so that one edge thereof opposite the fold will project beyond the adjacent parallel edge, inserting another sheet between the folds of the first sheet with one edge thereof projecting to a point intermediate the parallel edges of the folded sheet, slitting the folded sheet along its fold for a distance equal to the width of the longitudinal seam to be formed so as to provide flaps along one side, forming the sheets into a flat tube having its axis perpendicular to the fold, securing the free edges of the sheets opposite to the flaps between the latter and closing the end of the tube opposite the fold.

12. The method of manufacturing bags with sides formed by a plurality of layers of sheet material, which consists in transversely

folding a sheet of a length substantially double the length of the bag to be formed so that one edge opposite the fold projects beyond the adjacent and parallel edge, inserting other sheets between the folds of the first sheet so that the edge of edges of the latter will lie parallel to and intermediate the parallel edges of the folded sheet, securing the edge of the inserted sheet to one or both of the layers of the folded sheet, slitting the folded sheet along its fold for a distance equal to the width of the longitudinal seam to be formed, folding the composite sheets on longitudinal lines providing a flat tube having its axis perpendicular to the fold, and securing the side edges of the sheet layers between flaps formed on the opposite sides by the aforesaid slitting of the fold and then forming a bottom for and from the tube.

13. The method of manufacturing bags with sides of a plurality of layers of sheet material, which consists in transversely folding one sheet of the material, slitting the fold thereof at one corner for a distance equal to the width of a predetermined longitudinal seam, folding the folded sheet into a flat tube having its axis perpendicular to the fold, shaping the end of the tube opposite the fold end, fastening the sheet layers between flaps formed by turning back the longitudinal edges at the slitted side, pasting a piece of material over the turned edges of the tube so as to partly cover said flaps, and folding the uncovered parts of said flaps over said material and securing the same thereto by adhesive.

14. The method of manufacturing bags with sides of a plurality of layers of sheet material, which consists in transversely folding a sheet of material, slitting the fold at one side for a distance equal to the width of a predetermined longitudinal seam, folding the doubled sheet longitudinally into a flat tube having its axis perpendicular to the transverse fold, shaping the end of the tube opposite the transverse fold, forming longitudinal flaps by oppositely turning the longitudinal edges of the inner and outer layers at the slitted side of the sheet, pasting a piece of material over the turned edges of the tube sheet partly covering said flaps, folding the uncovered parts of the said flaps over said

material and securing a second piece of material over the bottom thus formed.

15. The method of manufacturing bags with sides of a plurality of layers of sheet material, which consists in transversely folding a sheet of material, slitting the fold at one side or corner for a distance equal to the width of a predetermined longitudinal seam, folding the folded sheet longitudinally to form a flat tube having its axis perpendicular to the transverse fold, shaping the end of the tube opposite the transverse fold, forming longitudinal flaps by oppositely turning the longitudinal edges of the sheet layers at the slitted side, pasting a piece of material over and partly covering said flaps so as to leave a portion of said material projecting beyond the same, folding the uncovered parts of said flaps over the adhering portion of material, and securing the projecting portions of the material over the folded parts of said flaps by means of adhesive.

16. The method of manufacturing paper bags according to claim 1, characterized by the fact that the outer and inner layer sheets are formed by cutting pieces from a paper strip folded together along an approximately central longitudinal line as it is drawn off a roll, said strip being of a width equal to substantially double the desired length of tubes to be formed and the pieces being cut therefrom to a width equal to the desired circumference of the tubes plus the desired width of adhesive seam.

17. The method of manufacturing paper bags according to claim 1, characterized by the fact that the outer and inner layer sheets are formed by cutting pieces from a paper strip folded together along an approximately central longitudinal line as it is drawn off a roll, said strip being of a width equal to substantially double the desired length of tubes to be formed and the pieces being cut therefrom to a width equal to the desired circumference of the tubes plus the desired width of adhesive seam and then stamped out lengthwise along desired fold lines.

In testimony whereof I have affixed my signature.

ERNST KLEIN.