

Aug. 31, 1926.

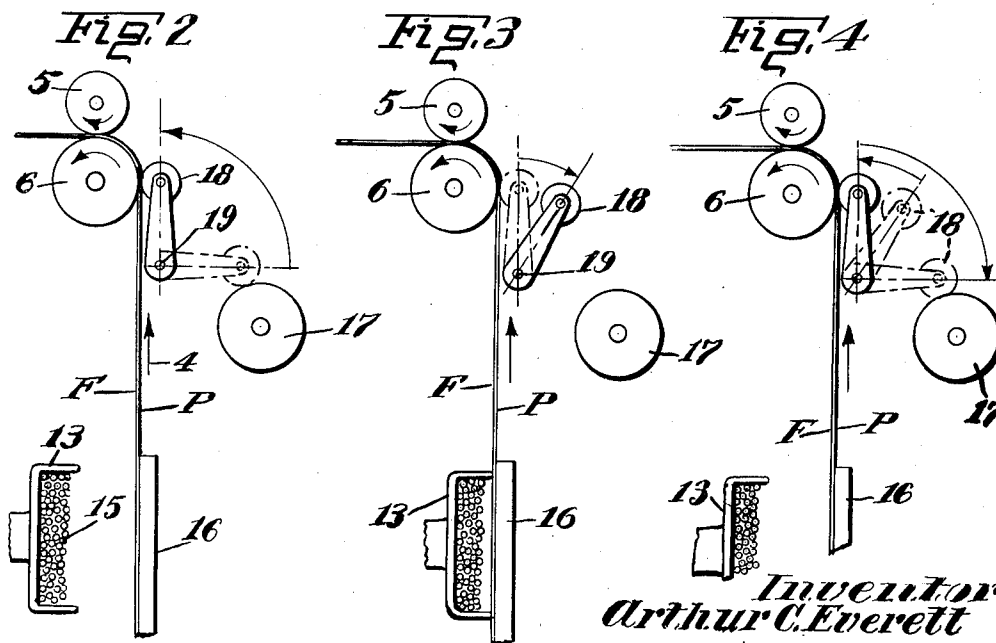
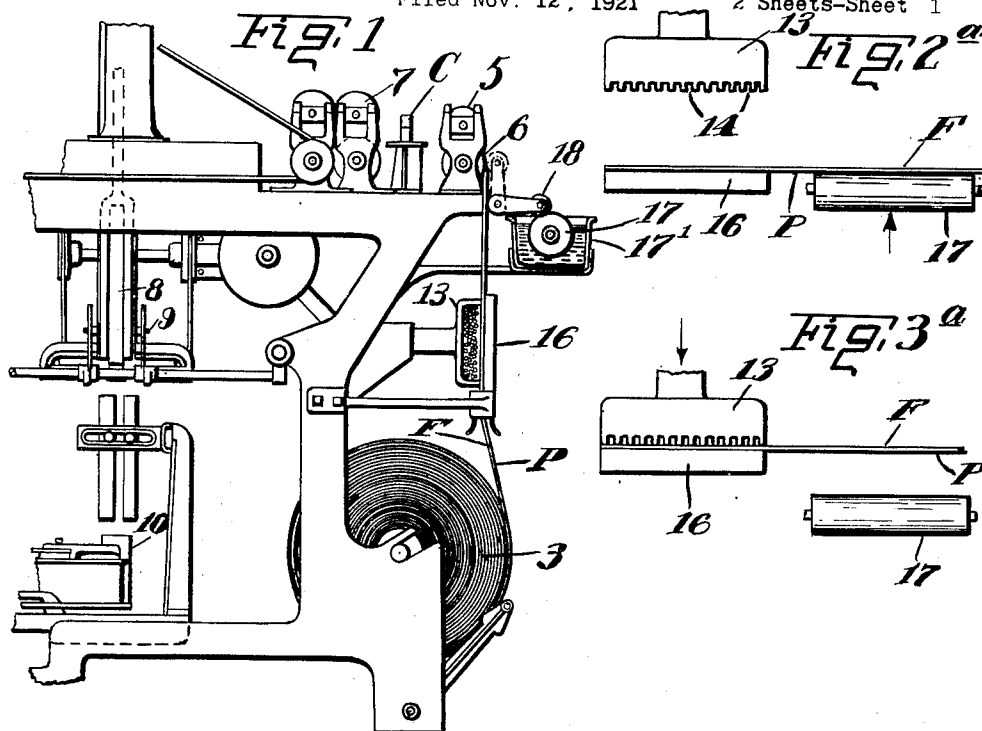
A. C. EVERETT

1,597,677

METHOD OF MAKING A CARTON LINER

Filed Nov. 12, 1921

2 Sheets-Sheet 1



Inventor  
Arthur C. Everett

By *Ellis Spragg*  
Attorney

Aug. 31, 1926.

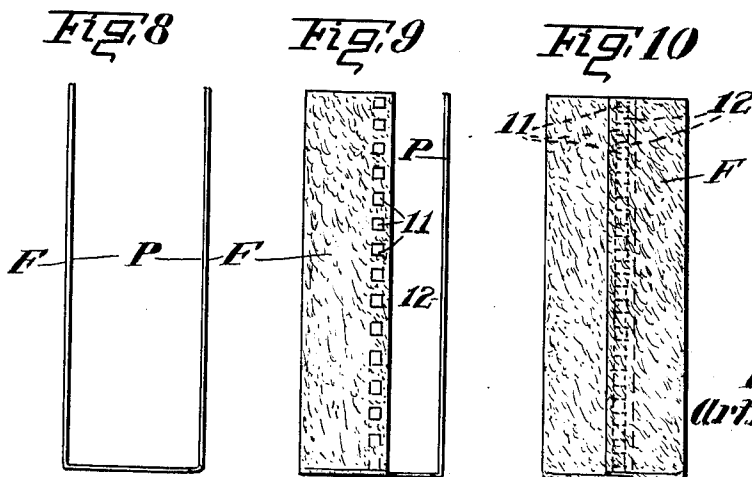
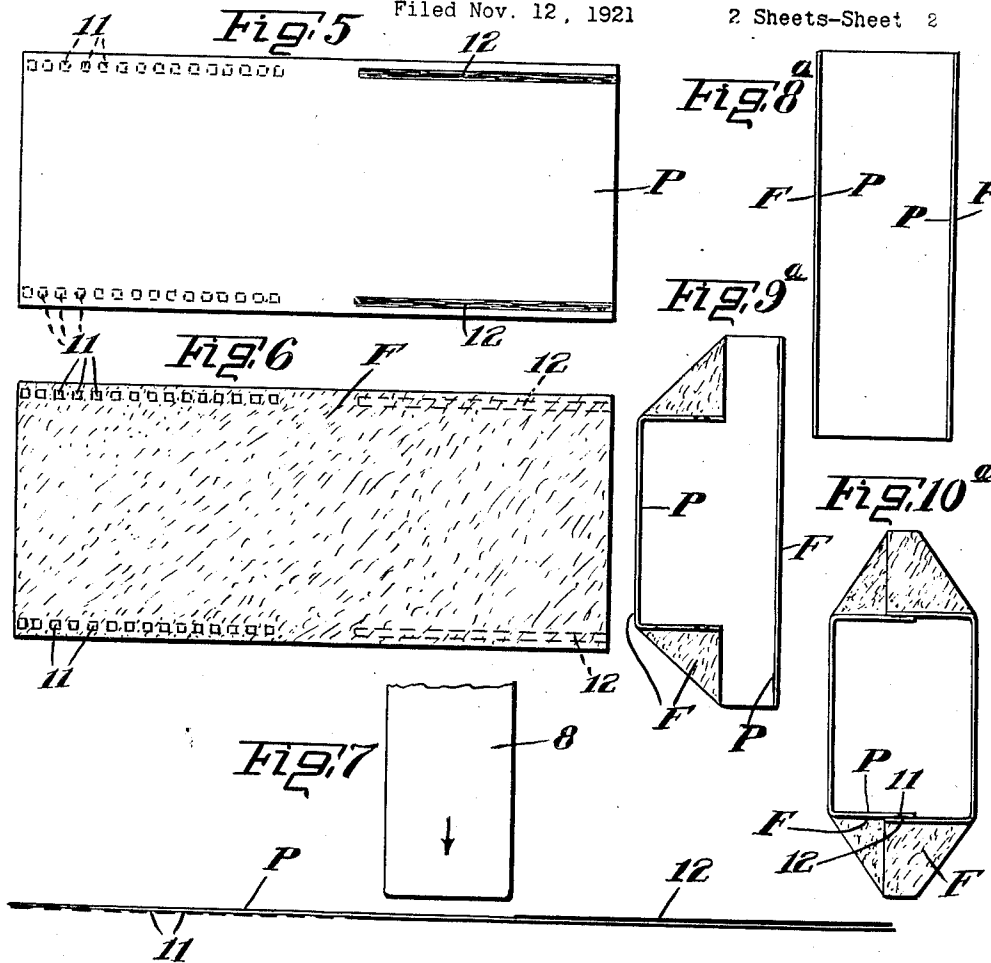
A. C. EVERETT

1,597,677

METHOD OF MAKING A CARTON LINER

Filed Nov. 12, 1921

2 Sheets-Sheet 2



Inventor  
Arthur C. Everett

By *Dee's Spear Jr.*  
Attorney

## UNITED STATES PATENT OFFICE.

ARTHUR C. EVERETT, OF ROXBURY, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO STATE STREET TRUST COMPANY, TRUSTEE, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## METHOD OF MAKING A CARTON LINER.

Application filed November 12, 1921. Serial No. 514,606.

This invention relates to carton liners and the method of preparing the same for insertion into the carton, and particularly to a composite liner consisting of a sheet of paper and a sheet of foil, as tin or lead foil.

The usual carton liner is a one-ply blank which is generally cut from a continuous strip of sheet material and folded around a forming block corresponding to the carton to be lined. The overlapping lateral edges of the folded blank are then united together and the forming block, with the liner folded and sealed thereabout, descends into the carton. The liner is stripped from the forming block and remains within the carton upon withdrawal of said block from the carton, after which the lined carton is filled, sealed, and wrapped.

The method of folding, sealing, and inserting the liner into the carton is described and illustrated in the Doble and Robinson Patent, No. 1,247,238, issued November 20, 1917, to which reference is made as showing a standard form of machine for this purpose.

The liner has usually been either an ordinary paper sheet, or a prepared wax or paraffine paper. Where ordinary paper is used, the overlapping edges of the folded blank are sealed to each other by gluing. Where a prepared wax or paraffine paper is used, such overlapping edges are sealed to each other by melting or softening the wax, so that said edges will firmly adhere when the wax again stiffens upon cooling.

For certain products, however, a liner of tin or lead foil has been found to possess many advantages over the usual paper, or waxed paper liner. The peculiarities characteristic of the foil itself as regards sealing, have however, prevented the general use of this material as a carton liner.

In the first place, it is not possible to apply heat to the foil to seal the overlapping edges as in the case of the waxed paper liner, nor can such edges be glued directly to each other, as in the case of the ordinary paper liner, because of the foil to foil contact at the overlapping edges of the blank.

I have discovered that it is possible to combine the superior preservative qualities of the foil lining with the glue absorbent qualities of the ordinary paper lining in a

single unitary liner which may be readily folded, sealed and inserted in the carton by such a standard machine as that shown in the Robinson and Doble patent with but slight modification of existing structure.

I attain this result by the use of a composite liner, consisting of a sheet of paper and a superposed sheet of foil, which when folded, sealed, and inserted within the carton, is disposed with the foil sheet against the carton walls and with the paper sheet exposed to the carton contents.

According to my invention, heat is applied to both longitudinal edges of the foil sheet at one side of its central median line and through approximately one half of its longer dimension to remove the foil, preferably at regularly spaced intervals, and thus expose corresponding portions of the outer face of the underlying paper sheet. Glue is applied to both longitudinal edges of the inner face of the paper sheet at that side of its central median line opposite the treated half of the foil sheet and through approximately one half of its longer dimension. The bands or zones of glue on the paper sheet are in line with the treated bands or zones of the foil sheet so that when the liner is folded for insertion into the carton they will overlap and the glued inner face of the paper sheet will adhere to the portions of the outer face of the paper sheet exposed through the openings in the foil sheet made by melting off the foil, thus affording a paper-to-paper seal at said overlapping edges.

It is, of course, highly desirable to utilize the existing equipment illustrated in the Doble and Robinson patent in connection with the composite liner, since these machines not only represent a considerable investment, but are in themselves equipment which has been found to be most satisfactory in preparing and inserting liners.

Preferably, therefore, the composite liner is fed in continuous strip form by a pair of feed rolls to a cutter where the strip is severed into blanks of proper dimension for folding, sealing, and insertion into the carton and during the feed of said strip and prior to the cutting operation, the foil sheet is subjected to heat treatment and glue is applied to the paper sheet in accordance with the principles of my invention. The

composite liner may, however, be fed in a variety of ways, and the steps of heat treatment and glue application may be performed at any desired time. The method  
5 just indicated, however, is preferable, especially with a liner machine of the type shown in the Doble and Robinson patent.

My invention, therefore, not only consists in the liner itself, but in the method of  
10 preparing such liner so that it may be sealed when inserted in the carton.

The particular liner involved herein, together with a preferred method of treating the same, and convenient apparatus for  
15 practicing such method, are described and illustrated in the accompanying specification and drawings, and the characteristic features of novelty are particularly pointed out in the appended claims. Throughout  
20 the specification and drawings like reference characters are correspondingly applied, and in the drawings:

Fig. 1 is a partial side elevation of a machine of the type shown in the Doble and  
25 Robinson patent and equipped for the practice of my invention.

Figs. 2, 3 and 4, are side diagrams illustrating the operation of the foil heating element and adhesive applying roller.

30 Figs. 2<sup>a</sup> and 3<sup>a</sup> are plan diagrams showing such elements in the positions of Figs. 2 and 3, respectively.

Figs. 5 and 6 are plan views of the liner blank prepared as indicated in Figs. 1 to  
35 4 inclusive and showing respectively the paper and foil faces thereof.

Fig. 7 shows diagrammatically the operation of the reciprocating forming block for  
40 folding the prepared liner blank and inserting it in the carton.

Figs. 8, 9 and 10 are side views showing successive phases in the operation of folding the prepared blank and uniting its overlapping edges, and

45 Figs. 8<sup>a</sup>, 9<sup>a</sup> and 10<sup>a</sup> are plan views corresponding to Figs. 8, 9 and 10, respectively.

The composite liner consists of a foil sheet F and a superposed paper sheet P which  
50 are drawn from the supply roll 3 of the machine in the direction of the arrow 4, Fig. 2, by a pair of superposed oppositely rotating feed rolls 5 and 6 to a transversely disposed cutter C which simultaneously severs the  
55 contiguous sheets into liner blanks of proper dimension (Figs. 5 and 6).

The blanks are then passed by suitable feed mechanism indicated generally at 7 to a reciprocable forming block 8. The  
60 liner is folded about the block 8 by suitable folding mechanism indicated generally at 9 and the overlapping side edges of the blank sealed to each other, whereupon the block with the liner disposed thereabout descends and inserts the liner into the carton  
65

10, which is supported below and in line with the forming block.

The method of treating the composite liner so that it may be sealed consists in applying heat to the foil face F of the  
70 liner at definite portions thereof to remove the foil, thereby exposing the outer face of the underlying paper sheet P so that the corresponding portions of the inner face of the paper sheet may be caused to adhere  
75 to said exposed portions of the outer face of the paper sheet when the liner is folded.

Considering the blank as it appears in Fig. 6, the foil is removed in any suitable  
80 way and preferably by heat treatment applied to both longitudinal edges of the foil sheet F at one side of the median line of the sheet, leaving two rows of holes or  
85 notches 11 through which the inner face of the underlying paper sheet P is exposed.

Glue is applied in zones or bands 12 adjacent both longitudinal edges of the outer  
90 face of the paper sheet at that side of its central median line opposite to the openings 11 in the foil sheet. The bands of glue 12 are in line with the openings 11 so as  
95 to afford a paper-to-paper sealing contact when the liner is folded.

The mechanism for applying heat to the foil face F of the liner may be of any desired type and as here shown consists of  
100 a movable heater 13 having regularly spaced notches 14 along one edge. The heater 13 encloses any suitable electrical resistance as at 15 and is mounted to move into contact  
105 with the foil face F of the liner at determined intervals and in properly timed relation to the feed of the liner strip past the heater. A backing 16 for the strip is arranged opposite the heater 13.

Adhesive is applied to the outer face of the paper sheet P from a glue roll 17 operating in a glue pot 17' by a glue transfer  
110 roll 18 which is pivotally mounted at 19 to rock against the paper face P of the liner strip opposite the feed roll 6, said feed roll 6 thus acting as a backing for the strip.

The heater and the glue applying roll 18 may operate simultaneously or they may  
115 operate at different intervals but the heater is located to contact the liner web preferably at least one blank length in advance of the point at which the glue applying roll  
120 contacts said web.

The glue applying roll 18 is preferably  
125 timed to swing into contact with the outer face of the paper sheet P of the composite strip, as shown in Figs. 2 and 2<sup>a</sup>, to apply one band of glue 12 approximately along one-half of the longitudinal edge of the  
130 sheet, and to then swing partly back towards the glue supply roll 17, Figs. 3 and 3<sup>a</sup>, while the heater 13 is advanced against the foil sheet F of the strip. After the heater has

operated, the strip is fed a distance slightly less than of a blank length so that when the glue applying roll 18 again swings into contact with the paper sheet the second band of glue 12 will be applied along one-half of the opposite longitudinal edge of the sheet. The roll 18 then swings back to the glue roll 17 (Fig. 4) to take up a fresh supply of glue (Fig. 4).

While I have shown and described my invention in its adaptation to the lining of cartons, it will be understood that such showing is purely illustrative and in no way limiting, and that the principles involved are applicable to other uses. For example, the folded and sealed blank itself might be used as a carton, particularly where heavy foil, as lead foil, is used. Indeed my invention is not to be regarded as limited to the use of foil as a combining element with the paper, but contemplates any metallic sheet or metal coated or impregnated material, or other material or coating, which does not afford a good adhering surface for the adhesive in itself, but is capable of being removed by fusion or otherwise to expose the underlying paper or other fibrous sheet, and the term "foil" where used in the specification and claims, is to be construed accordingly. Similarly the term "paper" as used herein is to be construed as meaning any fibrous sheet material, whether coated or impregnated, to which adhesive will readily adhere.

Various modifications in the practice of my invention may obviously be resorted to within the limits of the appended claims.

What I therefore claim and desire to secure by Letters Patent is:

1. The method of preparing a composite liner consisting of a foil sheet and a paper sheet co-extensive with said foil sheet, which consists in applying heat to melt out portions of the foil sheet adjacent both longitudinal edges thereof, and on one side of the transverse median line of the sheet to provide openings extending through approximately one half of the longitudinal extent of the sheet, and through which openings the underlying portion of the contiguous

face of the paper sheet are exposed, and in applying to the reverse face of the paper sheet adjacent both longitudinal edges thereof and in line with the openings of the foil sheet bands of adhesive extending through approximately one half of the longer dimension of the paper sheet, and on the opposite side of the transverse median line of the sheet, and which bands when the liner is folded, are adapted to contact the paper sheet exposed through said openings to permit a paper-to-paper seal.

2. The method of preparing a composite liner consisting of a foil sheet and a paper sheet co-extensive with said foil sheet, which consists in applying heat to the foil sheet to melt out a portion thereof to provide a marginal opening through which the underlying portion of the contiguous face of the paper sheet is exposed, and in applying to the reverse face of the paper sheet and in line with the opening of the foil sheet a band of adhesive which, when the liner is folded, is adapted to contact the portion of the paper sheet exposed through said opening of the foil sheet whereby to permit a paper-to-paper seal.

3. The method of preparing a composite liner consisting of a foil sheet and a paper sheet co-extensive with said foil sheet, which consists in applying heat to the foil sheet to melt out portions thereof adjacent both longitudinal edges of said foil sheet and through approximately one-half of the longitudinal extent of the sheet to provide an alined series of spaced openings through which the underlying portions of the contiguous face of the paper sheet are exposed, and in applying to the reverse face of the paper sheet adjacent both longitudinal edges thereof and in line with the openings of the foil sheet bands of adhesive extending through approximately one-half of the longer dimension of the paper sheet which adhesive bands, when the liner is folded, are adapted to contact the paper sheet exposed through said openings of the foil sheet whereby to permit a paper-to-paper seal.

In testimony whereof I affix my signature.

ARTHUR C. EVERETT.