

June 18, 1963

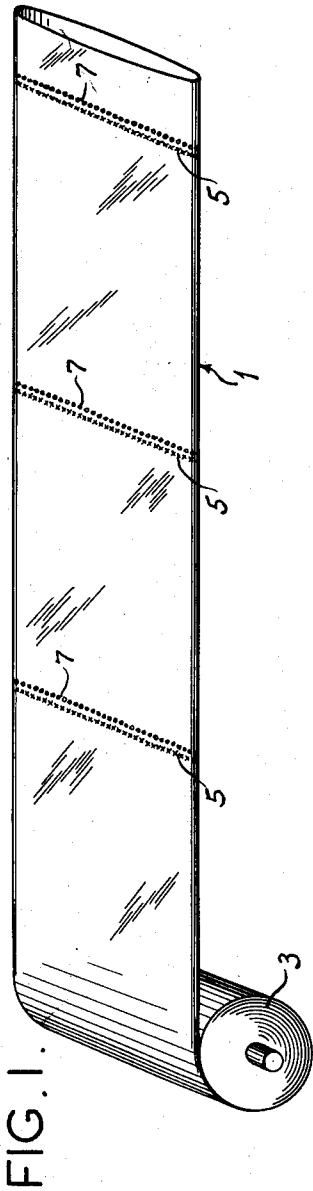
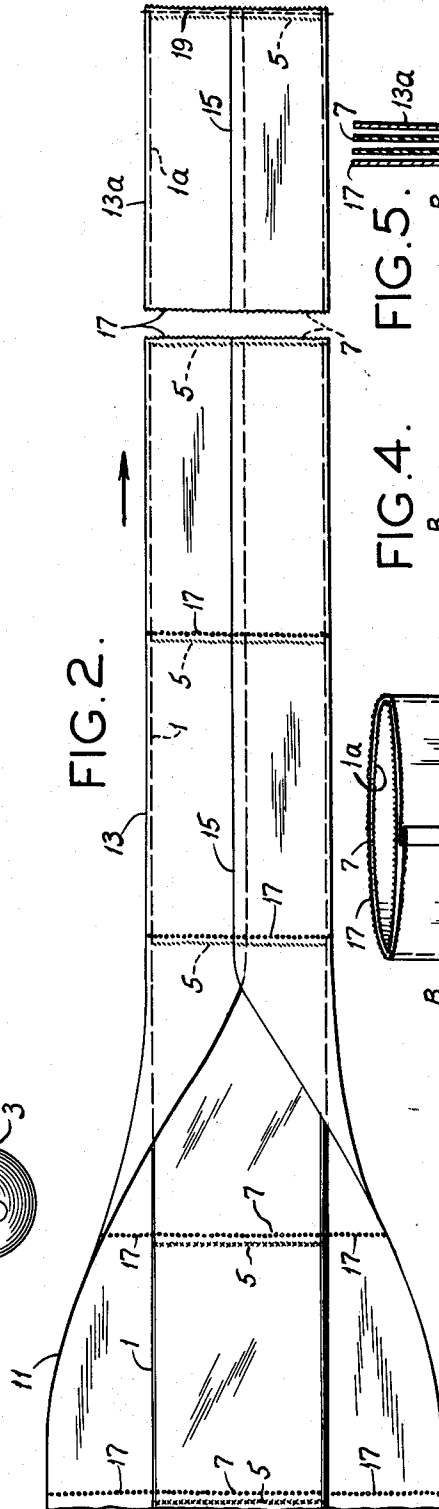
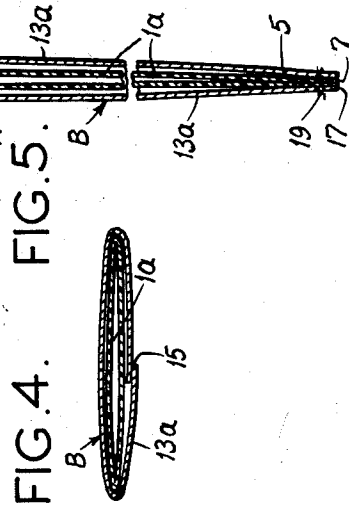
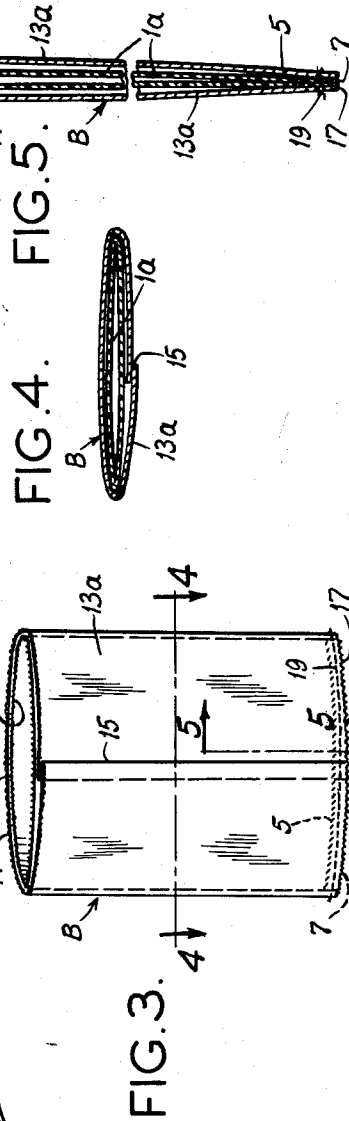
A. N. WEEKS

3,094,083

METHOD OF MAKING BAGS

Filed Feb. 13, 1961

2 Sheets-Sheet 1



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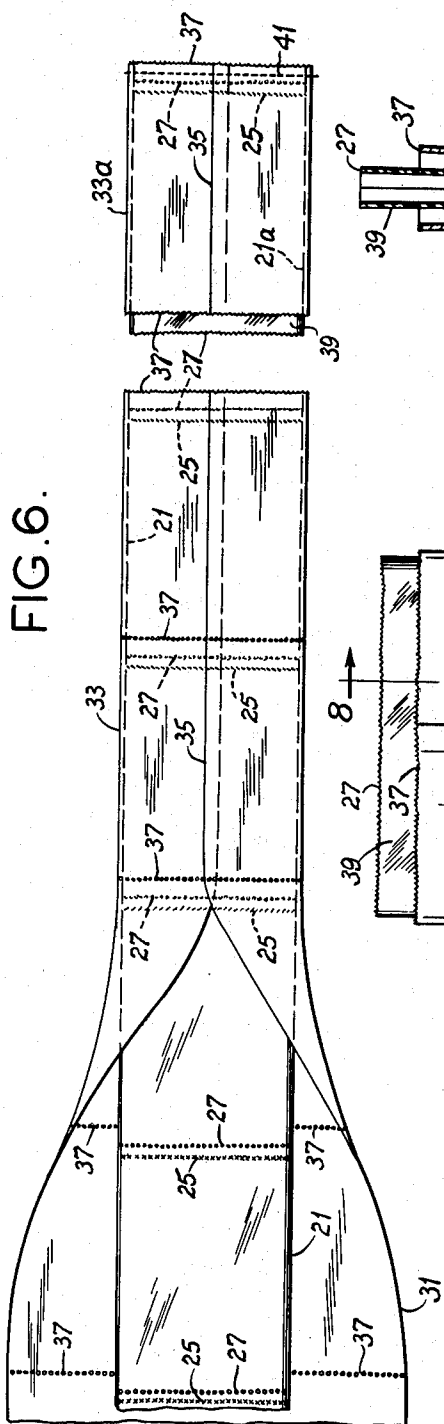
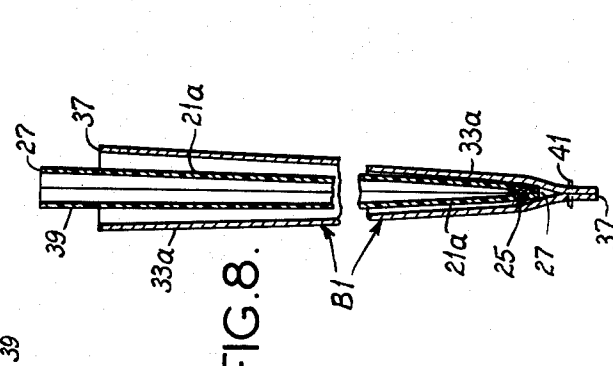
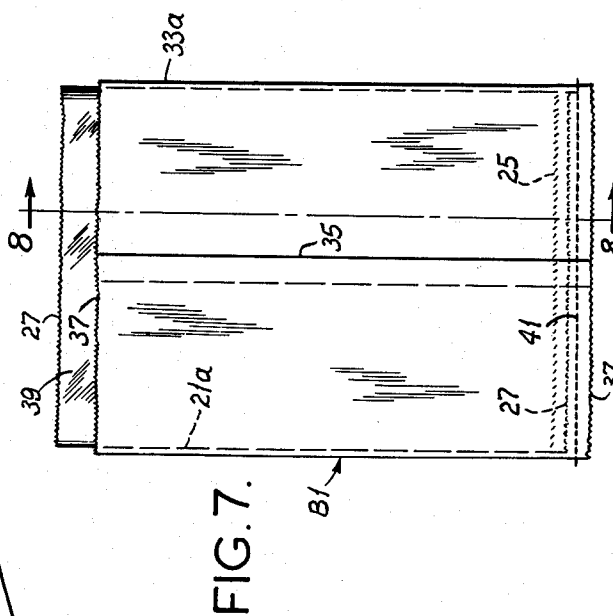
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2 Sheets-Sheet 2



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3,094,083

METHOD OF MAKING BAGS

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This invention relates to methods of making multi-wall paper bags having a tubular sheet plastic liner.

Among the several objects of this invention may be noted the provision of methods of economically manufacturing in quantity production sewn multi-wall paper bags having a liner which consists of a separate tube of sheet plastic material, the liner being hermetically heat-sealed at the bottom of the bag to prevent ingress of moisture and the bag also being sewn at the bottom to provide a strong bottom closure without affecting the hermetic seal. Other objects and features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the methods hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings, in which several of various possible embodiments of the invention are illustrated,

FIG. 1 is a perspective view illustrating a first step in the manufacture of bags according to this invention;

FIG. 2 is a plan view illustrating concluding steps of a first method of this invention for making a first type of bag;

FIG. 3 is a perspective view illustrating a bag made by the method illustrated in FIGS. 1 and 2;

FIG. 4 is a cross section taken on line 4-4 of FIG. 3, thicknesses being exaggerated;

FIG. 5 is a cross section taken on line 5-5 of FIG. 3, thicknesses being exaggerated and parts being broken away to reduce the height of the view;

FIG. 6 is a plan view illustrating concluding steps of a second method of this invention for making a second type of bag;

FIG. 7 is a view in front elevation of a bag made by the method of FIG. 6; and

FIG. 8 is a cross section taken on line 8-8 of FIG. 7, thicknesses being exaggerated and parts being broken away to reduce the height of the view.

Corresponding reference characters indicate corresponding parts throughout the drawing.

Referring to the drawings, FIG. 1 illustrates a first step common to the methods of this invention for making multi-wall paper bags having a tubular sheet plastic liner. As shown therein, flexible heat-sealable sheet plastic tubing 1 (polyethylene tubing, for example) is drawn from a supply roll 3 and provided with transverse heat seals 5 spaced at bag length intervals along the tube. Transverse lines of perforations 7 are made in the tubing (through both walls of the tubing), these lines being spaced at bag length intervals, and spaced from but adjacent to the transverse heat seals. The spacing between each line of perforations and the adjacent heat seal is only a short distance, such as, for example, one inch.

A paper web 11 (which may be a multi-ply paper web, although shown in the drawings as a single web for simplicity) is then formed into a tube 13 around the plastic tubing with the longitudinal edges of the paper web lapped and adhered together as indicated at 15. The formation of the paper web into a tube around the plastic tubing is carried out by means of a suitable conventional tuber, such as is well known in the art, while the plastic tubing and the paper web are fed in the direction indicated by the arrow in FIG. 2. As shown in FIG. 2, web 11 is provided with transverse lines of perforations 17

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spaced at bag length intervals before the web is formed into tube 13 around the plastic tubing.

The paper web and the plastic tubing are fed at the same rate of speed and, when the web is formed into tube 13 around the plastic tubing, the lines of perforations 17 in the web are brought substantially into registration with the lines of perforations 7 in the plastic tubing.

The resulting composite paper and plastic tubing is then segmented into individual bag lengths by snapping off the latter at the end of the tubing on the registering lines of perforations 7 and 17. It will be understood that instead of initially providing perforations in the plastic tubing and paper web, the composite paper and plastic tubing could be segmented into individual bag lengths by cutting off the individual bag lengths a short distance from each heat seal with a conventional cutter. Each bag length comprises a plastic liner 1a within a paper tube 13a, with a transverse heat seal 5 across the plastic liner adjacent one end of the bag length. Each bag length is then sewn across the width thereof on a line 19 between the heat seal 5 and the adjacent end of the bag.

As a result of the above described operations, a bag B (see FIGS. 3-5) is formed comprising an outer paper tube 13a (which may be a multi-ply paper tube) and a tubular sheet plastic liner 1a within the outer paper tube 13a. The liner is hermetically sealed at heat seal 5 adjacent one end of the bag to prevent ingress of moisture, and the bag has the sewn bottom seam 19 between the heat seal and the bottom of the bag to provide a strong bottom closure, with the needle holes made in sewing seam 19 below the seal 5 so that the hermetic seal is not affected.

The bag may be closed at the top after filling in various ways, such as, for example, bunching the top of the bag and tightly wire-tying, or providing a sewn top closure with a sealing tape over the sewing, or, if feasible for the type of paper used, heat-sealing and then sewing above the heat seal. When extensible paper is used, the paper may be folded down to expose the upper end of the plastic liner, which may then be heat-sealed, after which the paper may be brought back up and sewn.

FIG. 6 illustrates an alternative method of making paper bags with a tubular sheet plastic liner extending above the top of the outer paper tube. According to this method, flexible heat-sealable sheet plastic tubing 21 is provided with transverse heat seals 25 and transverse lines of perforations 27 adjacent the heat seals in essentially the same manner as shown in FIG. 1. However, each line of perforation and the adjacent heat seal may be more closely spaced than in the tubing shown in FIG. 1.

A paper web 31 is then formed into a tube 33 around the plastic tubing and the longitudinal edges of the paper web are overlapped and adhered together as indicated at 35 in conventional manner. The web is provided with transverse lines of perforations 37 spaced at intervals corresponding to the spacing of lines of perforations 27. The web 31 is formed into tube 33 around the plastic tubing 25 with the lines of perforations 37 offset from the lines of perforations 27 in the plastic tubing, and on the opposite side of lines 27 from the heat seals 25.

The resultant composite paper and plastic tubing is then segmented into individual bag lengths by snapping off the latter at the end of the tubing on the lines of perforations 27 and 37. Each bag length comprises a plastic liner 21a having a cuff 39 extending outwardly from one end of paper tube 33a which surrounds the liner, with a transverse heat seal 25 across the plastic liner adjacent the other end of the tube 33a and spaced inward therefrom. Each bag length is then sewn across the width thereof on a line 41 between the heat-sealed end

of the plastic liner and the adjacent end of the paper tube 33a.

As a result of the above described operations with respect to FIG. 7, a bag B1 (see FIGS. 7 and 8) is formed comprising an outer paper tube 33a (which may be a multi-ply tube) and a tubular sheet plastic liner 21a within the outer paper ply with the cuff 39 of the liner extending outward from the paper ply at the open end of the bag. The liner of the bag B1 is hermetically sealed at heat seal 25 adjacent one end of the liner to prevent ingress of moisture, and the bag has the sewn bottom seam 41 between the end of the liner adjacent the heat seal and the end of the bag to provide a strong bottom closure, with the needle holes in sewing seam 41 below the liner and heat seal so that the hermetic seal is not affected. The cuff extending above the paper ply may be conveniently heat sealed for closing of the bag, then folded down into the bag for sewing of a top closure.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above methods without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. The method of manufacturing paper bags with plastic liners comprising providing a length of heat-sealable plastic tubing with transverse heat seals spaced at intervals along the length of the tubing, forming a paper web into a tube around the plastic tubing, segmenting the resultant composite tubing into individual bag lengths on transverse lines spaced from but adjacent to the transverse heat seals and located at intervals along the length of said composite tubing, whereby each bag length comprises a plastic liner within a paper tube with a transverse heat seal across the plastic liner spaced from and adjacent one end of the bag length, and stitching each bag length across the width thereof along a line between said one end of the bag length and said heat seal.

2. The method of manufacturing paper bags with plastic liners comprising providing a length of heat-sealable plastic tubing with transverse heat seals spaced at bag length intervals, forming a paper web into a tube around the plastic tubing, segmenting the resultant tubing into individual bag lengths on transverse lines spaced from but adjacent to the transverse heat seals and located at bag length intervals along the length of said resultant tubing, whereby each bag length comprises a plastic liner within a paper tube with a transverse heat seal across the plastic liner spaced from and adjacent one end of the bag length, and stitching each bag length across the width

thereof along a line between said one end of the bag length and said heat seal.

3. The method of manufacturing paper bags with plastic liners comprising providing a length of heat-sealable plastic tubing with transverse seals spaced at bag length intervals and perforations on transverse lines spaced from but adjacent to the heat seals, forming a paper web having perforations on transverse lines spaced at bag length intervals into a tube around the plastic tubing, each line of perforations in the paper web being substantially in register with a line of perforations in the plastic tubing, segmenting the resultant composite tubing into individual bag lengths on the substantially registered lines of perforations, whereby each bag length comprises a plastic liner within a paper tube, the liner extending from one end of the paper tube to the other and having a transverse heat seal spaced from and adjacent one end of the bag length, and stitching each bag length across the width thereof along a line between said one end of the bag length and said heat seal.

4. The method of manufacturing bags with plastic liners comprising providing a length of heat-sealable plastic tubing with transverse heat seals spaced at equal intervals and with perforations on transverse lines adjacent the heat seals, forming a paper web having perforations on transverse lines spaced at said intervals into a tube around the plastic tubing, each line of perforations in the paper web being longitudinally spaced from a line of perforations in the plastic tubing, segmenting the resultant composite tubing into individual bag lengths on the transverse lines of perforations, whereby each bag length comprises a plastic liner within a paper tube, one end of the liner being spaced inward from one end of the paper tube and the liner projecting from the other end of the paper tube, the liner having a transverse heat seal spaced from and adjacent said one end of the paper tube, and stitching each bag length across the width thereof along a line between said one end of the paper tube and said heat seal.

5. The method of claim 4 wherein each bag length is stitched on a line between said one end of the paper tube and the adjacent inwardly spaced end of the liner.

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