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CONTINUOUS METHOD OF FORMING FLAT-FOLDED LINED CARTONS

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2 Sheets-Sheet 1

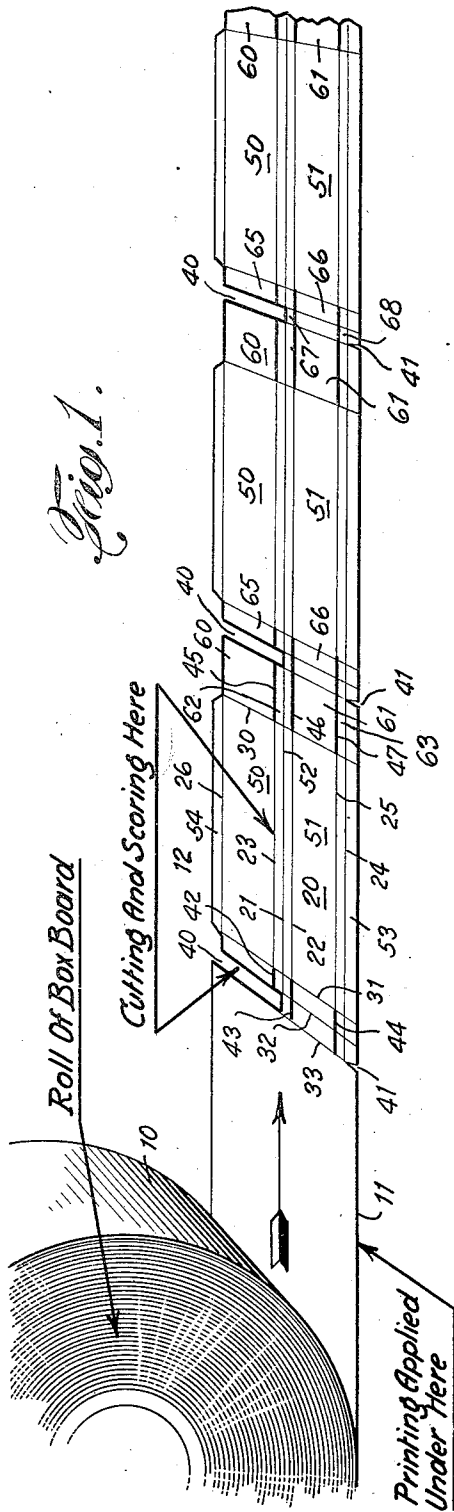
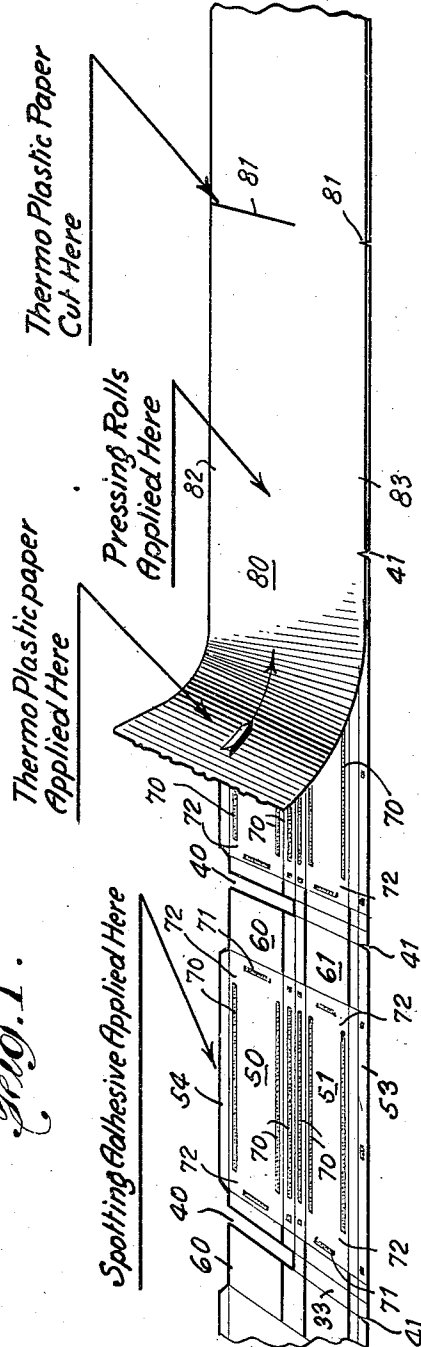


Fig. 1a.



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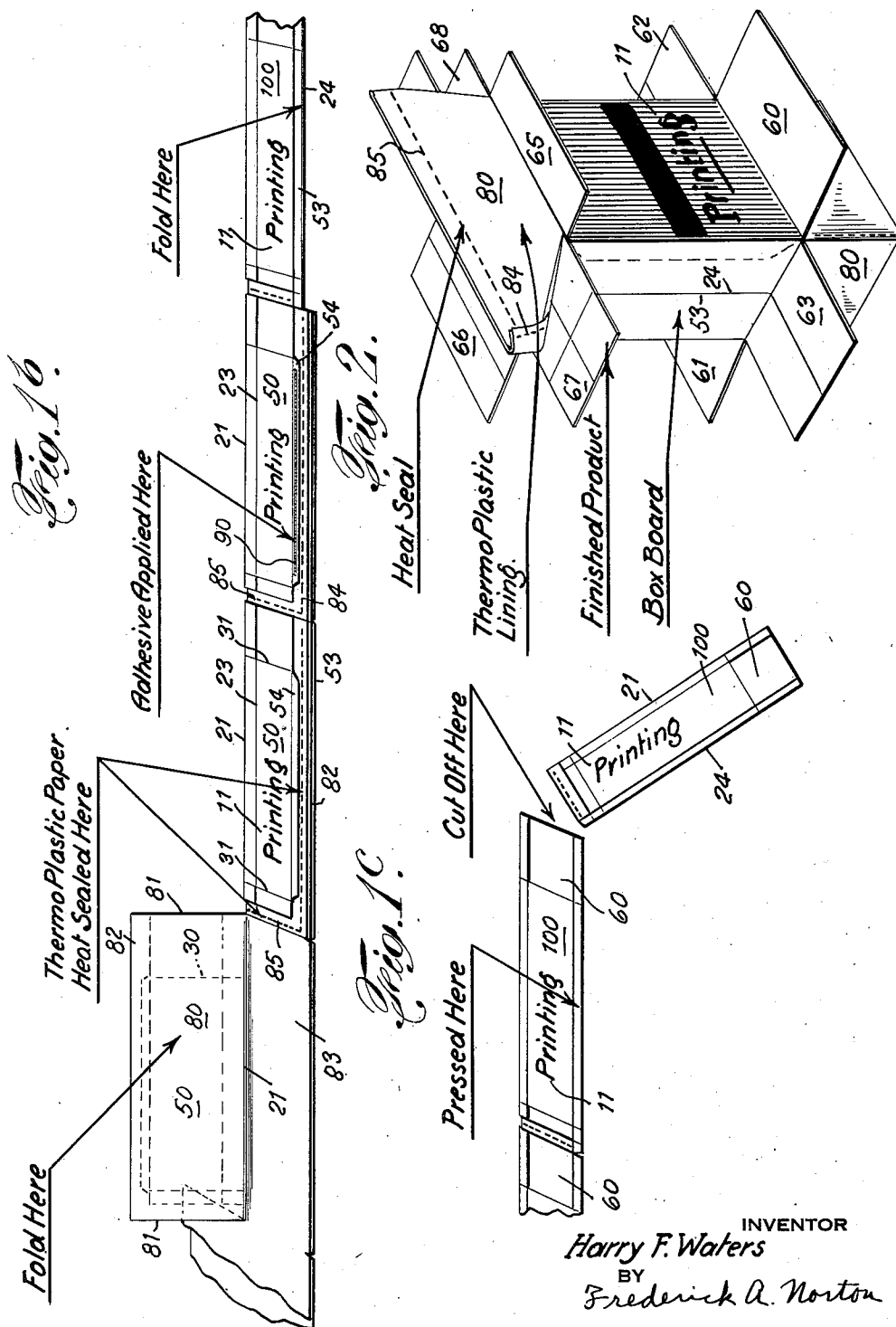
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UNITED STATES PATENT OFFICE

2,432,053

CONTINUOUS METHOD OF FORMING
FLAT-FOLDED LINED CARTONS

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1 Claim. (Cl. 93—45)

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The present invention relates to containers, and, more particularly, to an improved method of making containers in a continuous process.

Heretofore, various paper containers for holding liquids, and, particularly, fluent solids, have been proposed. Usually, these containers comprised external containers of paper, cardboard, or other sheetlike material, having appreciable strength, and an inner receptacle or container of flexible character and substantially impermeable to liquids and gases. The inner receptacle or container is characterized by a fluid-proof facing or sheeting mounted on or secured to a paper backing. Various plastic materials, and particularly thermoplastic, such as rubber hydrochloride, cellulose ethers and esters, and other compounds were used. These materials, when juxtaposed, were capable of being united and interfused by the application of heat and pressure.

In the preparation of such lined containers, it has been the usual practice to prefabricate the carton blanks in desired shapes and manually apply the desired lining materials, after which the fabricating or package erecting steps were carried out. Such manual operations were essentially slow and rendered the resulting products costly to a point where they could not compete with other materials currently fabricated by automatic machinery.

It is a feature of novelty of the present invention to provide a completely automatic method for fabricating lined containers continuously from strip materials. A further feature of novelty is the continuous fabrication of lined containers from strip material having package defining sections formed in the strip and the package, including the liner, substantially made up in flat condition before severing or otherwise removing from the continuous web or strip.

These and other desirable features and advantages of the present invention will be described in the specification and illustrated in the accompanying drawings, certain preferred products being delineated by way of illustration only, for, since the underlying principles may be embodied in other specific structures, it is not intended to be limited to the ones here shown, except where such limitations are clearly imposed by the appended claim.

In the drawings, like numerals refer to similar parts throughout the several views, of which:

Figs. 1, 1A, 1B, 1C are an elevation of the continuous steps in the fabrication of a container, and

Fig. 2 is a front perspective, showing the pack-

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age and liner in erected position ready for filling and sealing.

Referring more particularly to the drawings, the various stages of the process, as shown in Figs. 1, 1A, 1B, 1C, are designated by printed legends, and the specific details of the procedure will now be described.

A roll of box board, or the like, designated by the numeral 10, is maintained in the feed end of a machine, not shown, and on the underside of the sheet, as indicated at 11, printing may be applied. A suitable printing device may be incorporated in the machine assembly, but, as specific details of the machine parts form no part of the present invention, they are not shown, but are indicated schematically by the legends.

From the printing stage, the continuous web of board, 10, proceeds through a cutting and scoring stage, 12, wherein the web is blanked off and scored to give a bank 20, having central longitudinal score lines 21, 22, 23 and edge score lines 24, 25 and 26. End score lines 30, 31, 32 and 33, complete the scoring feature. In addition to scoring the web as indicated, cutouts 40, 41 and slots 42, 43, 44, 45, 46 and 47 complete the operation at this station. To perform these cutting and scoring operations, suitable apparatus, adapted to reciprocate back and forth and travel with the advancing web, and return to engage and work on a new section of the web, may be used. This type of construction is known as a flying-shears, and will not be described in detail, as the particular construction forms no part of the present invention.

The bank 20 will be seen to comprise a pair of panel sections 50, 51, and a central section 52 having longitudinal scoring 21 adapted to form a side wall of the finished package. In addition, there is an edge section 53, having a central longitudinal score line, 24, and adapted to form the opposite wall of the finished package, as well as an edge tab 54 adapted to be secured to section 53 to form the body section of the complete box. The end sections include, at the one end, tabs 60 and 61, separated by slots 45, 46 and 47 from central tabs 62, 63 held to the complete web by the material between the slots. The other end sections comprise corresponding end panels 65, 66 separated by score lines from the edge wall tabs 67, and 68.

The cutting and scoring lines and sections noted provide a continuous series of package or box blanks joined together in a continuous strip, and adapted to be severed or torn apart at the appropriate time.

After the web or strip of box board has been printed and blanked out into a continuous strip of cut and scored box blanks, joined together, the panel sections of the box-to-be are coated or spotted with discontinuous lines of adhesive, indicated generally at 70 and 71. The longitudinal and transverse marginal segments of each of the side wall sections includes a separate strip or portion of adhesive. It is to be noted that these bands or spots of adhesive do not come to the corners of the panels, leaving the latter free, as indicated generally at 72. When the adhesive is applied in the manner indicated, a second web of thermoplastic-faced paper, 80, is superposed on and over the continuous web of package blanks, and adhered thereto by suitable pressure, as by means of pressing rolls, not shown. The thermoplastic-faced paper may be a laminated product comprising a surface of liquid and gas-proof materials such as rubber hydrochloride, cellulose ethers and esters, maintained on, or supported by, a paper backing, with or without an interposed thermoplastic adhesive, and which adhesive may or may not include suitable plasticizing agents. The exposed thermoplastic face will form the interior surface of the lined carton, as will be more apparent hereinafter. The specific structure and compositions of the thermoplastic-faced paper as disclosed is more fully set forth and claimed in my applications Serial Numbers 239,253, filed April 12, 1940; 331,907, filed April 27, 1940; and 340,277, filed June 13, 1940. For certain uses, a plain thermoplastic liner may be used.

After the separate webs have been thus consolidated, and in order to facilitate the formation of a package with the liner, erected into shape, the composite web is cut, as indicated at 81, to provide a slot or cut in the thermoplastic sheet 80 conforming to the slot or cut 40 in the subjoined boxboard blank. From this cutting station the composite web proceeds to a folding station. Here, the blank section 50, with its superposed coating sheet 80, is folded over on central score line 21, so that the marginal edges 82 and 83 of the thermoplastic sheet are superposed in registration with each other over section 53 of the blank. It is to be noted that the marginal sections 82 and 83 of the thermoplastic sheet do not quite extend to the edge of the box blank underneath the same. With the panel 50 folded over on fold line 21 into engagement with panel 51, the edges of the thermoplastic paper are heat-sealed as indicated at 84 and 85 in an L-shaped seal to form a flat bag lining. This sealing may be accomplished by the use of my thermal sealing machines disclosed in Patents 2,262,480, of November 11, 1941; 2,125,758 of August 2, 1938; 2,220,873, of November 5, 1940; and 2,252,105, of August 12, 1941.

With the liner edges thus interfused to form a bag section within the folded over boxboard carcass, the web is next advanced, or continues its advance, to the next station, where a line of adhesive 90 is applied on the edge or surface of tab 54. The composite continuous web then advances to the folding station where edge section or tab 53 is folded up along score line 24 and over and onto the tab 54, the coating of adhesive, 90, joining the tabs together in a perfect joint. It will be noted that the edge section 53 folds over the edge seal 84 of the thermoplastic paper and

pinches or crimps same down in place without causing it to be contacted by the adhesive 90. The complete flat box or container, now designated, for convenience, by the numeral 100, will next pass through a pressing station where the adhesive joined seams are pressed down to a smooth finish. The blanks then continue to the cutting off station where the flat packages 100 are cut off or severed along the line formed between slots 40 and 41.

The packages, in this flat-folded condition, are adapted to be shipped flat, with an enormous saving of space, and when they are to be used, they can be pinched at the edges along lines 21, and 24 to be immediately erected into the package shown in Fig. 2. In this package, the sealed end seal section 80 is folded in any suitable manner on itself and the tabs 65, 66 and 67, 68 are sealed together to close the bottom leaving an open mouthed package having an erected inner liner 80 adhered thereto at marginal sections but free of adherence, or "floating" in the several corners of the finished package.

It will now be appreciated that a novel method of continuously forming liquid-proof, lined packages directly and continuously in folded, flat form, in a single continuous folded over web of laminated material has been disclosed. This is susceptible of adaptation and use in continuous printing, cutting and scoring mechanisms so as to permit a continuous or intermittent throughput, as desired, and avoiding the necessity of carrying out several operative steps by hand.

What is claimed is:

The method of forming flat-folded paper-board packages having envelope liners formed integrally therewith and erectible into squared up use position, comprising die-cutting an advancing web of paper-board; adhering a superposed sheet of thermoplastic onto and over the advancing web, thereby conforming the thermoplastic lining to the web sections; folding the composite sheet to place the thermoplastic liner in juxtaposition and with the edges thereof in registration; heat-sealing the registering longitudinal edges of the thermoplastic liner and the trailing ends of the same to form an L-shaped seam forming a flat envelope; folding and adhering the edge of the paper-board over and on itself to form a flattened tube enclosing the envelope, and severing the tube and envelope from the continuous web.

HARRY F. WATERS.

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