

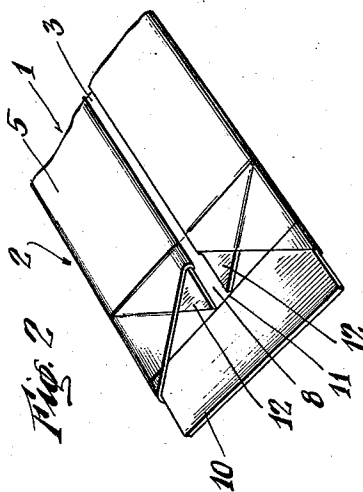
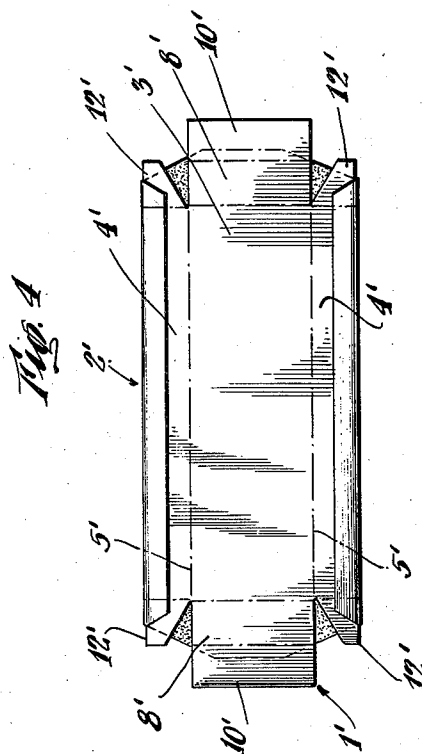
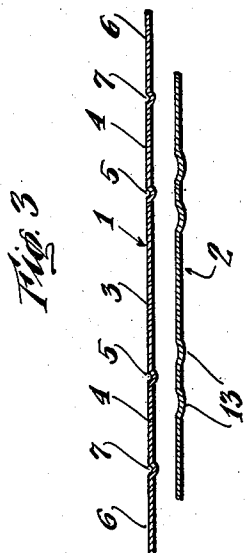
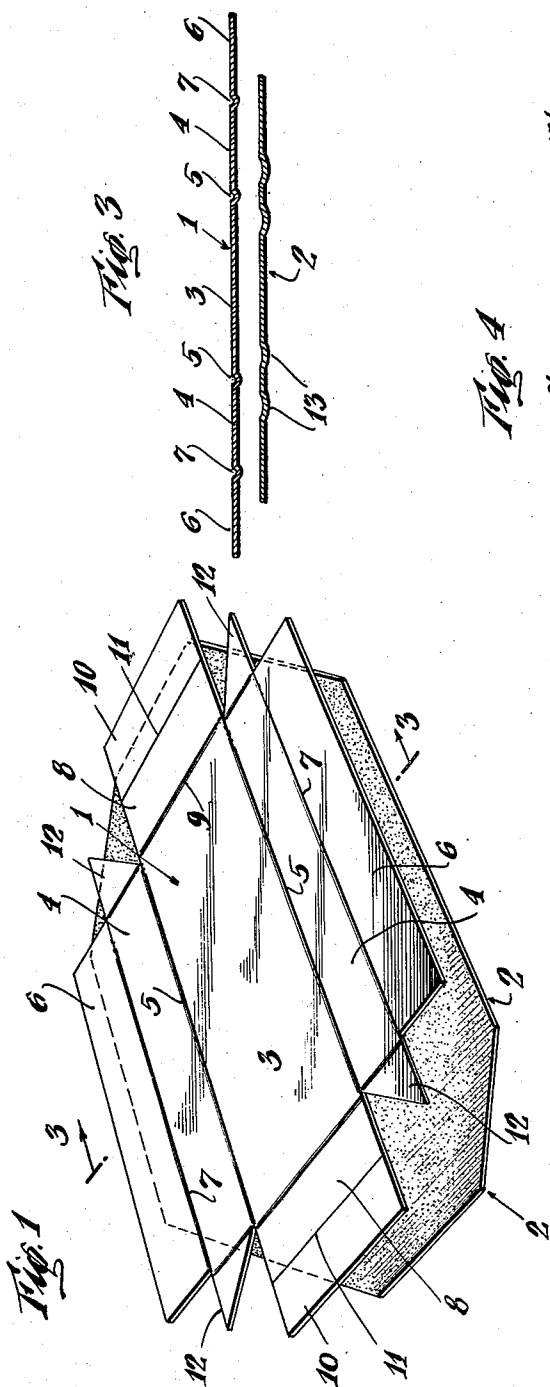
Jan. 11, 1938.

G. B. SCHEFFEY
METHOD OF MAKING BOXES

2,105,270

Filed June 12, 1936

3 Sheets-Sheet 1



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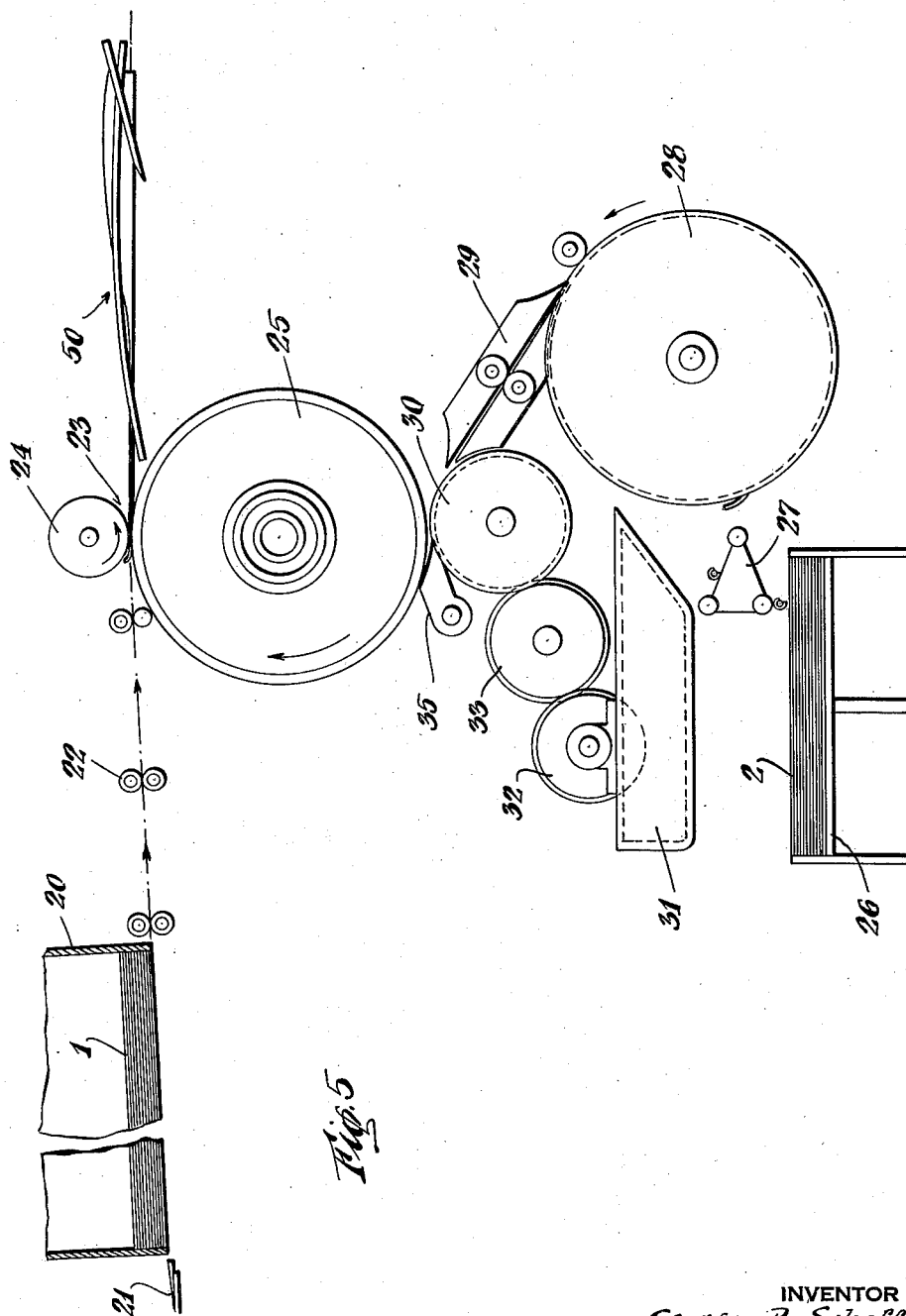
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

Fig. 7

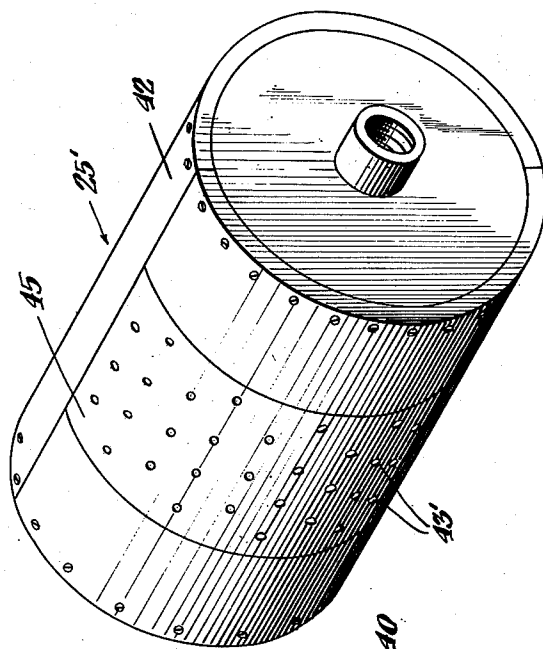
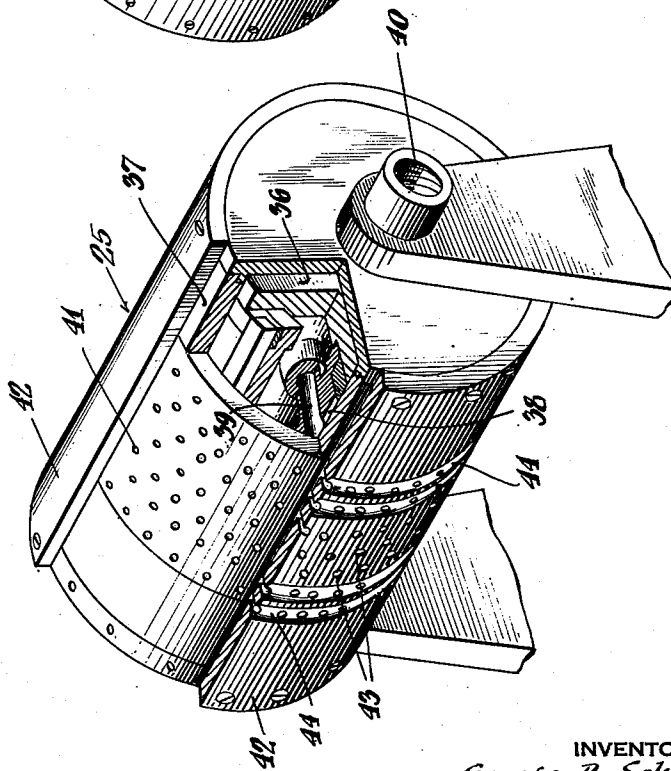


Fig. 6



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2,105,270

METHOD OF MAKING BOXES

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New York, N. Y., a corporation of Delaware

Application June 12, 1936, Serial No. 84,830

13 Claims. (Cl. 93—36)

This invention relates to a method of making boxes and, more particularly, to a method of applying a flexible wrapper to a paperboard blank suitable for forming either a folding or set-up box.

According to the invention, a box blank is suitably blanked out and scored ready for folding or setting up and a flexible wrapper of suitable size and shape is registered with the box blank. The blank and wrapper are pressed together and secured by an interposed adhesive. The blank and attached wrapper are then folded along certain of the fold lines of the blank and pressed into a compact folded structure and provide a smoothly wrapped blank which may be easily and quickly set up to form a box. The adhesive is allowed to dry, and the folded box is then ready to be set up whenever desired or can be stored or shipped in this folded condition.

The invention provides a method in which a blank and wrapper can be quickly and easily brought in register and secured together and the wrapper and blank folded and may be packed with similar wrapped blanks for shipment. The method insures that the wrapper and blank are brought into accurate register and are maintained in register during attachment of the wrapper. The blank and wrapper are folded while in accurate register and the fullness of the wrapper is drawn out by the folding operation so that the wrapper fits tightly over all portions of the blank including both flat sides and edges.

The invention is capable of being carried out with numerous types of box blanks and with various types of apparatus, and the invention is not limited to the specific types of blanks or apparatus herein disclosed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which:

Fig. 1 is a perspective view showing one form of blank and wrapper adapted to be assembled by the present process;

Fig. 2 is a fragmentary perspective view of a portion of the blank and wrapper of Fig. 1, after folding;

Fig. 3 is a view showing a section taken along line 3—3 of Fig. 1;

Fig. 4 is a top plan view of another form of blank with a wrapper attached thereto;

Fig. 5 is a somewhat diagrammatic side elevational view of one form of apparatus suitable for carrying out the invention and illustrating one form of the novel process;

Fig. 6 is a perspective view of a portion of the apparatus shown in Fig. 5 and illustrates the feeding mechanism for registering the wrapper with the blank; and

Fig. 7 is a view corresponding to Fig. 6 showing a slightly modified form of feeding mechanism.

Referring now to Fig. 1, there is shown a rectangular blank 1 having a main section 3, side sections 4, bendable about fold lines 5, and side flaps 6 foldable about fold lines 7, for providing with side sections 4, side walls of double thickness.

Extending from the ends of the main section 3 are end wall sections 8 bendable about fold lines 9 and having their flaps 10 foldable about fold lines 11 to provide with the section 8 an end wall of double thickness. End wings 12 extend from side sections 4.

The wrapper 2 may be formed of a suitable flexible material which may be suitably finished as by calendaring, loading, glazing, embossing, printing, or otherwise, or may be plain paper, as desired. The wrapper 2 preferably is generally rectangular but may take various forms as may be found desirable.

Referring to Fig. 4, there is shown a slightly modified type of blank 1', which is suitable for forming a box of the "set-up" type. The blank 1' may be generally similar in construction to the blank 1 except that the side sections 4' provide side walls which may be of single thickness and the end wings 12' may be trapezoidal. The wrapper 2' may be suitably formed to provide a suitable covering for the blank 2'.

The blank 1 is wrapped by registering the wrapper 2 therewith with a suitable adhesive interposed between the registered blank and wrapper. Immediately after the adhesive is applied, the blank and wrapper are pressed into engagement to cause the blank to adhere to the wrapper and the blank with the attached wrapper is folded along the lines 5; the side flaps 6 are suitably secured to the side sections 4 to provide a wall of double thickness.

The folding of the side walls of the blank draws the wrapper tightly against the walls and edges of the blank and causes the wrapper to adhere smoothly to the blank. If desired, the wrapper 2 may have longitudinal grooves or wrinkles

temporarily formed therein prior to the folding of the blank, thereby to provide an excess of wrapper material adjacent the several portions of the blank during the preliminary folding of the blank.

The blank 1' may be wrapped in a manner generally similar to that previously disclosed. A suitable adhesive is applied and the wrapper and blank are brought into register and the side sections 4' folded over along lines 5' so that they lie flat against the bottom section 3'. If desired, both the side sections 4' and the end flaps 10' may be folded over, or alternatively, instead of folding the blank flat, it may be set up immediately after the adhesive is applied and the blank and wrapper are brought into register.

Referring to Fig. 5, there is disclosed one form of apparatus suitable for carrying out the present invention. A plurality of blanks 1 are arranged in a stack in a suitable holder 20 and are fed therefrom by a feeding device 21 and picked up by a suitable conveyor 22 by which they are conveyed to a registering device 23.

The registering device may comprise a roll 24 and a cooperating cylinder 25 hereinafter described more in detail. However, the details of construction of the registering device may vary widely, or other suitable types of registering devices may be employed.

A plurality of wrappers 2 may be disposed in a stack on a suitable support 26 and a feeding device 27 is adapted to engage the wrappers 2 individually and supply them successively to a feeding drum 28. A guide 29 receives the wrappers from the drum 28 and supplies them to a guide 35 adapted to guide the wrappers successively into engagement with the feeding cylinder 25. A gluing roll 30 may be disposed in a convenient position, for example, between the guide 29 and the cylinder 25 and may be supplied with a suitable adhesive from a tank 31 by supply rolls 32 and 33.

Adjacent the registering device 23 is a folding device 50 of suitable construction and adapted to fold over the edges of the wrapper against the blank and thereafter to fold over the sides or ends and ends of the blank. If desired, a setting up machine (not shown) may be disposed adjacent the registering device whereby the blank may be set up to form a box immediately after the blank and wrapper are brought into registry.

The feeding cylinder 25 is shown more in detail in Fig. 6 and may comprise an inner drum 36 and an outer drum 37 surrounding the inner drum 36 and rotatable with respect thereto. A space 38 is provided between the inner drum 36 and the outer drum 37 and communication therewith is provided through a duct 39 and conduit 40 and suitable suction means (not shown), may be attached to the conduit 40 for creating a suction in the space 38.

The outer drum 37 is provided with a plurality of perforations 41 extending throughout a portion of the circumference and a portion of the length. The outer drum 41 may be enclosed in a facing shell 42 provided with a plurality of perforations 43 registering with the perforations 41. If desired, the facing shell 42 may be provided with circumferential grooves 44 for the purpose of temporarily forming the grooves or wrinkles 13 in the blank as will hereinafter appear. Alternatively, the facing shell may be formed as shown in Fig. 7, wherein the shell 42 is provided with a smooth portion 45, having perforations 43' extending therethrough.

The operation of the apparatus is as follows: The blanks 1 are fed successively from the holder 20 and are carried by the conveyor 22 to the registering device 27 and drum 28 through guide 29 and past gluing roll 30, which applies a suitable adhesive to the wrapper.

The flexible wrappers are then successively picked up by the feeding cylinder 25 as the perforated portion passes the guide 35. A sufficient suction is maintained in the space 38 to cause each wrapper to adhere closely to the feeding cylinder and be transferred from the guide 35 to the roll 24. The blanks 1 and the wrappers 2 pass between the roll 24 and cylinder 25 in correctly timed relation so that each wrapper 2 is registered exactly with the corresponding blank 1.

As soon as the wrapper and blank are registered, the wrapper and attached blank pass through the folding device 50 and the edges of the wrapper are folded over against the blank and the blank is folded, and the wrapper thus exactly registers with and lies smoothly against all portions of the walls and edges of the blank 1.

It will be seen that the present process is one which can be carried out automatically and very rapidly by suitable apparatus. The process insures that the blank and wrapper are accurately registered and secured together to provide a smooth, even and accurately positioned wrapper. The wrapped blank may be discharged from the machine either as a folded blank and thus can be stored or shipped in this convenient form, or it can be set up, and discharged as a fully wrapped, fully set-up box.

While certain novel features of the invention have been disclosed and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

This application is a continuation-in-part of my copending application Serial No. 40,488, filed September 13, 1935.

What I claim is:

1. The method of carrying out a box wrapping operation by means of automatic machinery which comprises feeding a series of box blanks to a wrapping point, feeding a series of flexible wrapping sheets to said wrapping point, applying an adhesive so that the sheets will adhesively adhere to the blanks respectively, immediately thereafter registering the sheets with the blanks respectively, and immediately thereafter folding portions of each blank, and the applied sheet adhering thereto through an angle approaching 180° relatively to other portions of the blank.

2. The method of wrapping a box blank on automatic machinery which comprises feeding a scored box blank to a wrapping point, feeding a wrapper to the wrapping point, applying an adhesive to said wrapper just prior to reaching the feeding point, registering said blank and said wrapper, and folding said registered blank and wrapper prior to setting of the adhesive or tempering of the blank or wrapper.

3. The method of wrapping a rigid paperboard blank suitable for forming a set-up box, which comprises feeding a blank to a wrapping point, feeding a flexible wrapper to said wrapping point for registering with said blank, applying an adhesive just prior to registering said blank and wrapper, registering said wrapper and blank, applying the wrapper to the blank and folding said blank with the attached wrapper prior to tempering of the blank or wrapper.

4. The method of applying a wrapper to a box blank which includes adhesively attaching the wrapper to the blank and folding the blank and attached wrapper prior to tempering of the blank or wrapper.

5. The method of wrapping a paperboard box blank which includes applying adhesive to a wrapper, attaching the wrapper to the blank and folding the side walls of the blank over against the bottom wall, prior to setting of the adhesive, thereby to draw the wrapper out tightly and smoothly against the blank.

6. The method of wrapping a paperboard blank which includes, applying adhesive to the wrapper, applying the wrapper to the blank, turning the wrapper over edges of the blank, and folding predetermined portions of the blank over against other portions prior to setting of the adhesive, whereby portions of the wrapper slip relatively to the blank to cause the wrapper to lie tightly and smoothly against the blank.

7. The method of applying a wrapper to a box blank which includes adhesively attaching the wrapper to the blank, folding edge portions of the wrapper over corresponding edges of the blank and folding the blank and wrapper prior to setting of the adhesive, whereby any fullness in the wrapper is drawn out prior to tempering of the wrapper whereby to prevent warping or distorting of the blank upon drying of the adhesive.

8. The method of covering a box blank which includes adhesively attaching a wrapper to the blank and folding the blank and attached wrapper prior to tempering of the wrapper or setting of the adhesive.

9. The method of covering a box blank which includes adhesively attaching a wrapper to the blank and folding the blank and wrapper through an angle of substantially more than 90° throughout substantially the entire finished box length to draw the wrapper taut against the blank prior to setting of the adhesive.

10. The method of forming a wrapped, set-up box, which includes adhesively attaching a wrap-

per to a box blank while in the flat, folding the blank into flat folded form to draw the wrapper taut, prior to setting of the adhesive and thereafter setting up and adhesively securing together portions of the covered blank to form a box.

11. A method of applying a wrapper or liner to a paperboard blank which includes assembling the wrapper or liner to the blank with an adhesive interposed therebetween and bending the blank uniformly along a predetermined line through an angle of substantially more than 90° while the adhesive is in condition to permit slipping of the wrapper or liner relative to the blank, whereby to smooth out any wrinkles or creases in the wrapper or liner and to draw the same tightly against the blank on both sides of said line of bending.

12. A method of wrapping a paperboard box blank having a bottom panel, side and end panels hingedly connected to the sides and ends of said bottom panel respectively, and end wall flaps hingedly connected to the outer edges of said end panels and end wings hingedly connected to the end edges of said side panel, which method comprises assembling a wrapper with said blank, interposing an adhesive between the wrapper and at least the side panels, end wall flaps and end wings, and folding at least said side panels substantially throughout their lengths toward said bottom panel, through an angle substantially exceeding 90°, prior to setting of the adhesive whereby to draw the wrapper tightly and smoothly against said blank.

13. The method of forming a collapsible box which includes adhesively applying a wrapper to a box blank in flat form and folding portions of said blank and applied wrapper through an angle of approximately 180° while the adhesive is in a condition to permit slipping of the wrapper relatively to the blank, whereby to draw the wrapper taut and smooth out any wrinkles or creases therein.

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