Aug. 12, 1958 E. S. KARDON ET AL 2,846,928

METHOD OF MAKING BAGS

Filed Feb. 6, 1956

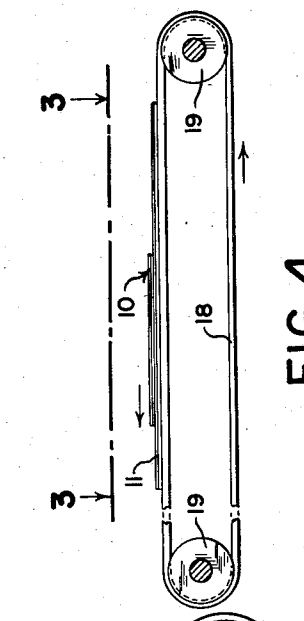


FIG. 1

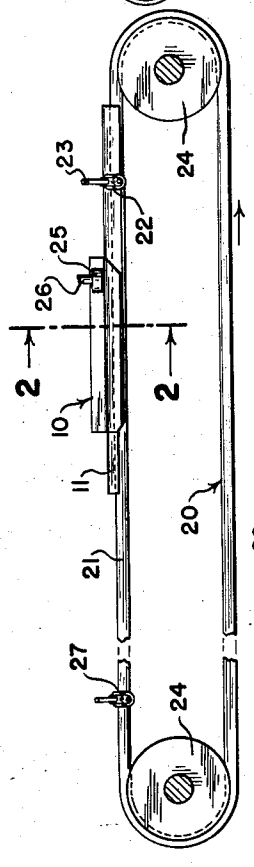


FIG. 4

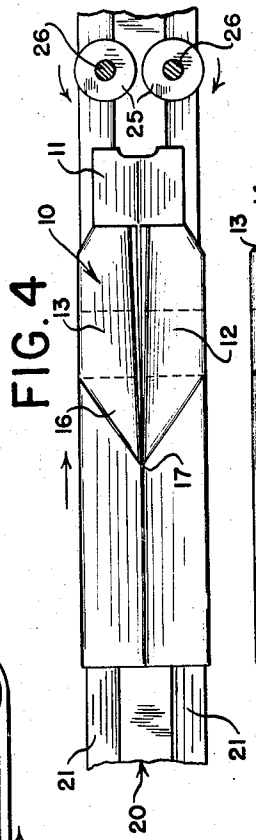


FIG. 5

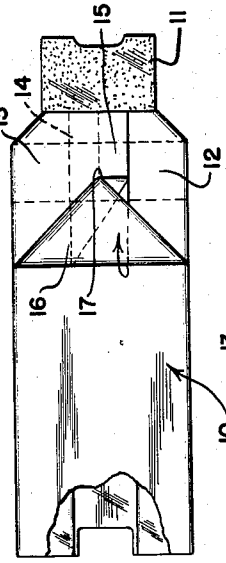
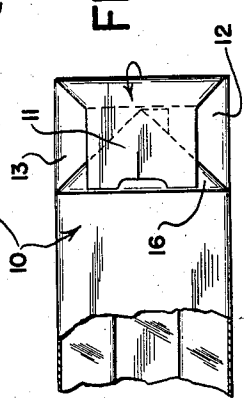


FIG. 6



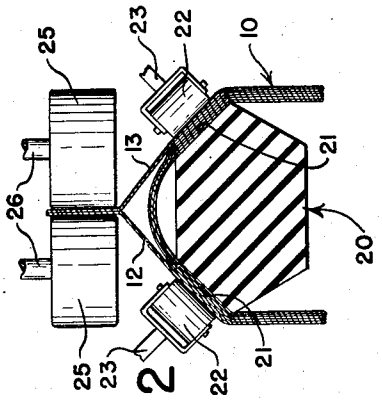


FIG. 2

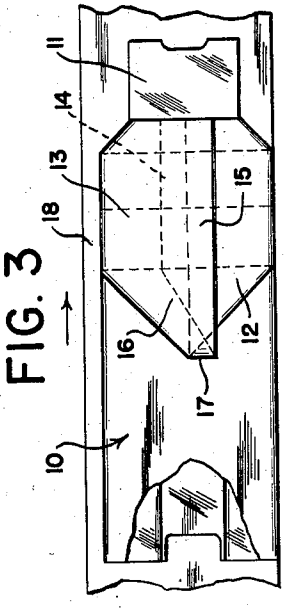


FIG. 3

INVENTORS
EMANUEL S. KARDON
BY HANS VOLKSDORF
Pennie, Edmonds, Morton, Barrows & Taylor
ATTORNEYS

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2,846,928

METHOD OF MAKING BAGS

Emanuel S. Kardon, Melrose Park, and Hans Volksdorf, Philadelphia, Pa., assignors to American Bag & Paper Co., Philadelphia, Pa., a corporation

Application February 6, 1956, Serial No. 563,640

2 Claims. (Cl. 93—35)

This invention relates to the manufacture of paper bags, and more particularly to a method of sealing flaps in the manufacture of various types of bags.

In producing bags on the automatic machines in use today, the bag is formed from a tube of the bellows fold type. The tube is cut in suitable lengths, slits are made in the tube, at one end, and the material adjacent the slits is folded in diamond or partial diamond folds to form the bottom of the bag. One such bag is described and claimed in the prior patent to Emanuel S. Kardon, No. 2,496,796, granted February 7, 1950.

In the manufacture of the Kardon bag, and other similar bags, flaps are formed during the folding of the bottom which overlap each other and the overlapping portions are later sealed to each other. This sealing step must be performed at high speed when the bags are made on the automatic machines now in use. The present invention is directed to a method whereby the overlapping portions of the flaps may be rapidly and effectively positioned and sealed.

In carrying out the invention, the partially formed bag is conveyed over or along a support with the overlapping portions of the flaps at the center and extending longitudinally of the support. The sides of the partially formed bag are bent downwardly causing the bag to assume the shape of an inverted V in lateral cross-section. This causes the overlapping portions of the flaps to be extended upwardly in close proximity to each other and, therefore, permits them to be sealed to each other as the bag moves along the support.

In the accompanying drawings we have diagrammatically illustrated our method of positioning and sealing the flaps of a bag. In this showing:

Fig. 1 is a diagrammatic side elevation of a feeder conveyor, and a conveyor on which the method is performed;

Fig. 2 is a vertical, sectional view on line 2—2 of Fig. 1;

Fig. 3 is a plan view of the feeding conveyor on line 3—3 of Fig. 1 showing the condition of the bag prior to the sealing operation of the present invention;

Fig. 4 is a plan view of a bag on the sealing conveyor showing the condition of the bag, after positioning of the overlapping portions of the flaps and prior to the sealing of them;

Fig. 5 is a plan view of a bag after the next operation in the formation of the bottom of the bag; and

Fig. 6 is a plan view of a portion of a bag showing the bottom completely formed.

The bag **10** may be formed of a single layer of paper or other suitable material, but it is preferably formed of an outer layer of paper and an inner lining preferably made of a sheet of material impervious to the passage of air, vapor, or moisture, but which is sufficiently fusible, upon the application of heat to cause the abutting faces to adhere to each other to provide a seal. However, if desired, the inner lining may comprise a layer of suitable material applied directly to the inner face of the paper of which the outer sheet of the bag is made.

The inner lining is preferably made of a separate sheet

of heat sealable material which may in itself be thermo-plastic, or the surface of said inner liner sheet may be coated with thermo-plastic material, so as to cause the abutting faces of said material to adhere to each other upon the application of heat at the desired places during the formation of the bag.

Of course, if desired, the seal of the inner lining may be obtained by the use of suitable adhesive applied at the desired places to cause the faces of the inner liner to adhere to each other at such places.

In forming the bottoms of such bags, the material is folded into a diamond or partial diamond fold. In the partial diamond fold of the Kardon patent, which is used herein for the purpose of illustration, a tab **11** projects from one end of the diamond fold and the two layers of material or flaps **12** and **13** extend from each side toward and beyond the center of the bag. As each of these layers is wider than one-half the width of the bag, they extend beyond the center and form overlapping portions **14** and **15**. A diamond fold **16** formed by the continuation of the flaps **12** and **13** is arranged opposite the tab **11**. The ends of the overlapping portions of the flaps **14** and **15** are connected by a fold or crease **17**.

When the sealing step of the present invention is to be performed, the bag bottom is partially formed and is in the condition shown in Fig. 3 of the drawings. The flaps **12** and **13** are portions and the flap **14** is under the inner edge of flap **13**. The portion **15** on the edge of flap **13** extends over a portion of lower flap **12**. In such condition, the embryo bag is fed by an endless belt **18** to the apparatus to the left of Fig. 1 where the positioning and sealing operations are performed. Belt **18** passes over rollers **19**, one of which is driven by suitable means (not shown).

At the end of belt **18** the bag passes to an endless belt **20**, preferably of the shape shown in Fig. 2 of the drawings. Any shape whereby portions of the bag on each side of the center may be bent may be employed. As shown, the two sides of the bag are bent downwardly and lie along the inclined sides **21** of the belt. One means for bending the sides of the bag illustrated in Figs. 1 and 2 consists of rollers **22** mounted in suitable brackets **23**. When the bag, on each side of the overlapping portions **14** and **15** of the flap is bent by the rollers **22**, the overlapping portions assume a vertical position, as illustrated in Figs. 2 and 4. The open ends of these portions, opposite the crease **17**, are slightly spaced from each other as shown in Fig. 4. As the bags move along the conveyor **20** the over-lapping portions **14** and **15** are sealed to each other. The belt **20** passes over pulleys or rollers **24**, one of which may be driven by any suitable means.

With the overlapping portions **14** and **15** in the vertical position, as shown in Figs. 2 and 4, the positioning and sealing of them may be accomplished while the bags are traveling at the high speed at which modern bag making machines are operated, whether the sealing is to be done by heat, pressure, heat and pressure, or by application of a liquid adhesive from which the solvent is later evaporated. One means of sealing is diagrammatically illustrated by rollers **25** mounted on vertical shafts or supports **26**. These rollers bring the spaced edges of the portions **14** and **15** (Fig. 4) together and may exert sufficient pressure to seal them if a pressure sealing adhesive is employed; they may be heated to heat the adhesive when a heat sealing adhesive is employed, or they may merely serve to cause the inner faces of the overlapping portions to contact each other to permit sealing by a previously applied liquid adhesive from which the solvent is later evaporated.

Beyond the flap sealing means, the conveyor **20** may be provided with a second pair of rollers **27**, similar to

rollers **22**, to hold the bag in engagement with conveyor **20** and assure its passage along the conveyor to the next step in the bag making operation. After sealing the overlapping portions **14** and **15** are folded over the surface of one of the flaps **12** and **13**, and the diamond fold **16** is then folded over the partially formed bag bottom, as shown in Fig. 5. The flap **11** is then folded over the bottom and sealed to complete the bottom of the bag, as shown in Fig. 6.

By arranging the overlapping portions **14** and **15** vertically and with the faces which are to be united adjacent each other, the operation may be performed at the speed at which bag making machines operate and thus not form a bottle-neck in the operation.

We claim:

1. The method of sealing a pair of adjacent flaps of the bottom of a partially formed bag in which the bottom is formed of two flaps each of which is wider than one-half the width of the bag thereby providing a pair of overlaping portions at the center of the bag, the steps comprising conveying the partially formed bag along a support in a flat condition substantially parallel to the surface of the support with a portion of one of the flaps overlying the other and with the overlapping portions extending longitudinally of the direction of movement of the bag, bending the bag on each side of the longitudinal center as it travels along the support to cause the overlapping portions to assume a vertical position adjacent each other, and sealing the said portions to each other while in such position.

2. The method of sealing a pair of adjacent flaps of the bottom of a partially formed bag in which the bottom is formed of two flaps each of which is wider than one-half the width of the bag thereby providing a pair of overlapping portions at the center of the bag, the steps comprising delivering the bag along a conveyor section which is flat and on which the partially formed bag travels in a flat condition with a portion of one of the flaps overlying the other and with the overlapping portions extending longitudinally of the direction of movement of the bag, delivering the partially formed bag along a second conveyor section, bending the bag on each side of the longitudinal center as it travels along said second conveyor section to cause the overlapping portions to assume a vertical position adjacent each other, and sealing the said portions to each other while in such position.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,846,928 August 12, 1958

Emanuel S. Kardon et al.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 27, for "portions and the flap" read -- flat and the portion --.

Signed and sealed this 11th day of November 1958.

(SEAL)

Attest:
KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents