

UNITED STATES PATENT OFFICE

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METHOD OF MAKING BAGS

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3 Claims. (Cl. 93—35)

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The present invention relates to a method of forming bags, and has special reference to sleeve valves that are particularly adapted for multi-ply crinkled paper bags of the type of the one described and claimed in the patent to Edward D. Greene, No. 2,314,876, dated March 30, 1943.

One of the objects of the invention is to provide a method of forming a bag of the character indicated having a sleeve valve which is of simple and strong construction and convenient in use, and may be easily formed either by hand or by machine.

Another object of the invention is to provide a novel and improved method of forming a sleeve valve for a bag of this character.

Still another object of the invention is to provide a novel and improved method of closing the end of a bag of the character indicated.

The invention is illustrated by way of example in the accompanying drawings, in which:

Figure 1 is a side view of a bag having a portion thereof broken away to save space, and with a sheet applied thereto from which the sleeve of the valve of the bag is to be formed;

Fig. 2 is a transverse sectional view, taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view, partly in elevation, of one corner of the bag with the corner tucked in to form a valve and with the sleeve attached thereto, the section being taken substantially on the line 3—3 of Fig. 4;

Fig. 4 is a sectional view, taken substantially on the line 4—4 of Fig. 3;

Fig. 5 is a side view of the upper portion of a bag with its upper end closed by a sealing strip and a line of stitches, the sealing strip also being employed to close the outer end of the valve sleeve;

Fig. 6 is a detail sectional view taken on the line 6—6 of Fig. 5;

Fig. 7 is a view corresponding to a portion of Fig. 5, but illustrating another means that may be employed for closing the outer end of the valve sleeve;

Fig. 8 is a sectional view, taken on the line 8—8 of Fig. 7; and

Fig. 9 is a view corresponding to Fig. 3, but with the valve and valve sleeve formed in a gusseted bag, the valve sleeve being of another modified form.

The bag illustrated in the drawing is a multi-ply crinkled paper bag having the crinkles 2 thereof extended transversely of the bag to provide for longitudinal stretchability. The lower end of the bag is shown closed by a tape 4 folded over the lower ends of the side walls of the bag, and a line of stitches 6. This bag is of the type of the one described and claimed in said Greene Patent 2,314,876 to which reference may be had for a full and complete description of the same.

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In accordance with the present invention, the valve sleeve is formed from a rectangular sheet of paper 8 that is coated on one side with a thermoplastic resin such as polyethylene put out by Du Pont for coating and heat-sealing purposes. The coating is preferably of a thickness of from .002 to .003 inch. The coating may be either cast on the sheet or a film of the coating adhered to the sheet by heat or other means. The coated sheet is crinkled longitudinally, and in certain instances may be provided with transversely extending crinkles, flattened corrugations, or other means to increase the flexibility thereof and provide for stretchability in more than one direction.

This sheet 8 is folded over the upper end portion of one of the longitudinal edges of the bag with its coating on its inner side. Heat and pressure are then applied to the portions of the sides of the sheet that extend over the corner of the bag that is to be tucked in to form the valve so as to heat-seal the sheet to said corner, the inner boundary of this corner being defined by the diagonal dotted line 10 and the heat-sealing area being indicated at 11. Such heat and pressure sealing forces the ridges and valleys of the crinkled sheet into a more or less nested relationship with the ridges and valleys of the crinkles in the outer surface of the bag and adhesively secures them thereto, and thus a strong and tight bond is provided throughout the secured areas of the sheet and corner of the bag.

After the sheet has thus been secured in position, said corner of the bag is folded or tucked in on the line 10 to form a valve having side walls 12 and a horizontal bottom wall portion 14.

The attached sheet 8 is folded in with the corner of the bag and assumes a horizontal position as shown in Fig. 3. The ends of the sheet extend beyond the ends of the valve, the longitudinal edges of the sheet are flush with the upper end edges of the bag, and the sides of the sheet are secured to the side walls 12 of the valve by the heat and pressure sealing above described.

The upper end of the bag is preferably closed by a strip or tape 16 of crinkled paper which has its inner side coated with a thermoplastic resin as in the case of the coating on one side of the sheet 8, the crinkles extending longitudinally of the tape. This tape is folded over the upper end edges of the bag and over the projecting longitudinal edges of the sheet 8, and is secured in position by a line of stitches 18. Heat and pressure are then applied to the tape 16 so as to adhesively secure the strip over the sides of the bag and to cause the plastic to fuse with the plastic coating on the valve sheet or sleeve 8, the crinkles in the tape 16 nesting with the crinkles in the bag walls and valve sleeve. By

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using a coating of sufficient thickness such as .003 of an inch it has been found that such fusing of the coating not only effectively adheres the strip to the bag walls of the sheet 8, but also serves to effectively seal the needleholes.

In applying the sleeve to a gusseted bag as shown in Fig. 9, the valve 20 having the usual valve extension 22 is first formed in the corner of the bag and then the valve sheet 8' is folded and inserted in the valve. The sheet may then be secured in the valve by the application of heat and pressure applied to the side walls of the bag over the valve, so as to fuse the plastic coating on the outer side of the sheet to the side walls of the valve.

The thermoplastic coating on the valve sleeve also enables the outer end of the valve to be securely sealed. One manner of thus sealing the end of the valve sleeve is illustrated in Fig. 5 in which the end of the tape 18 is provided with an extension 24 which is folded down over the end of the sleeve and against the coated outer sides of the sleeve. Heat and pressure are then applied to the sides of this extension 24 so as to cause its coating to tightly fuse with the coating on the sleeve. In Figs. 7 and 8 the end of the sleeve is shown sealed by turning in the ends 26 thereof and heat-sealing. In Fig. 9 the end of one of the walls of the sleeve is provided with a cutaway portion 28 whereby the adjacent portion of the other wall of the sleeve may be folded over and heat-sealed to the other side of the sleeve.

It will be apparent that applicant's sleeve valve is of simple and strong construction and convenient in use; may be easily formed either by hand or machine, and that it is particularly adapted for multi-ply crinkled paper bags such as that illustrated and described. Owing to the substantial nesting of the crinkles in the valve sleeve and side walls of the valve a secure seal is provided upon fusing of the coating by the application of heat and pressure, and there is no danger of sifting or other leakage occurring between the sleeve and the valve walls. The thermoplastic sealing of the crinkled closure strip or tape 16 ensures against leakage through the needleholes or beneath the tape.

While it is preferred to employ the thermoplastic coated valve sleeve and sealing tape which have the advantages above described, it will be apparent that in certain cases uncoated material may be employed, the securing being accomplished by pasting or gluing. Also that the sleeve valve may be applied to other types of bags, of paper or other material.

What I claim is:

1. The method of forming a sleeve valve in a bag of the class described which comprises folding a sheet having a thermoplastic coating on the inner side thereof over the upper end portion of one of the longitudinal edges of the bag, applying heat and pressure to the portion of the sheet overlying the adjacent corner of the bag to cause the coating to adhesively secure said sheet over said edge and to the side walls of said corner, tucking in said corner of the bag with said sheet attached to form a valve, the folded sheet being so positioned that the ends thereof when the corner is folded in extend beyond the inner and outer ends of the valve and the longitudinal edges of the sheet are substantially flush with the upper edges of the bag walls, folding a tape having a thermoplastic coating on its inner side over

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the upper edges of the bag and over the longitudinal edges of the sheet, and applying heat and pressure to said tape to cause it to adhere to the upper margins of the side walls of the bag and the longitudinal margins of said sheet.

2. The method of forming a sleeve valve in a multi-ply crinkled paper bag of the class described having the crinkles extending transversely of the bag, which comprises longitudinally folding a sheet of crinkled paper having a thermoplastic coating on the inner side thereof over the upper portion of one of the longitudinal edges of the bag, applying heat and pressure to the portions of the sheet overlying the adjacent corner of the bag to cause the coating to adhesively secure the sheet over said edge and to the side walls of said corner of the bag, tucking in said corner of the bag with said sheet attached to form a valve, the folded sheet being so positioned that the ends thereof when the corner is folded in extend beyond the inner and outer ends of the valve and the longitudinal edges of the sheet are substantially flush with the upper edges of the bag walls, and applying heat and pressure to the upper edges of the bag walls to cause said coating to secure said upper edges and the longitudinal edges of the sheet together.

3. The method of forming a sleeve valve in a multi-ply crinkled paper bag of the class described having the crinkles extending transversely of the bag, which comprises longitudinally folding a sheet of crinkled paper having a thermoplastic coating on the inner side thereof over the upper portion of one of the longitudinal edges of the bag, applying heat and pressure to the portions of the sheet overlying the adjacent corner of the bag to cause the coating to adhesively secure the sheet over said edge and to the side walls of said corner of the bag, tucking in said corner of the bag with said sheet attached to form a valve, the folded sheet being so positioned that the ends thereof when the corner is folded in extend beyond the inner and outer ends of the valve and the longitudinal edges of the sheet are substantially flush with the upper edges of the bag walls, folding a strip of crinkled paper over the upper edges of the side walls of the bag and over the longitudinal edges of said sheet, said strip having a thermoplastic coating on its inner side, securing said strip in position by a line of stitches extending therethrough and through the side walls and longitudinal margins of said sheet, and applying heat and pressure to the sides of the strip to cause the coating on the strip to adhesively secure it to said side walls and to seal the needle holes, and to cause the coating on the sheet to adhesively secure the longitudinal edges of the sheet and the upper edges of said side walls together.

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