Dec. 13, 1966 J. G. LEPISTO ETAL 3,291,374

MULTI-PLY BAG AND PROCESS FOR THE MANUFACTURE THEREOF

Filed March 30, 1965 4 Sheets-Sheet 1

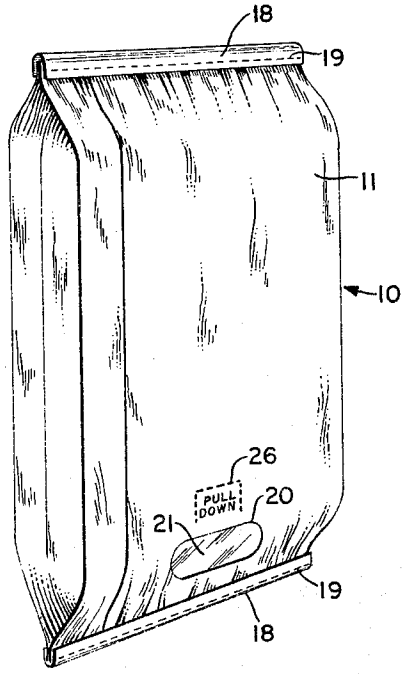

FIG. 1

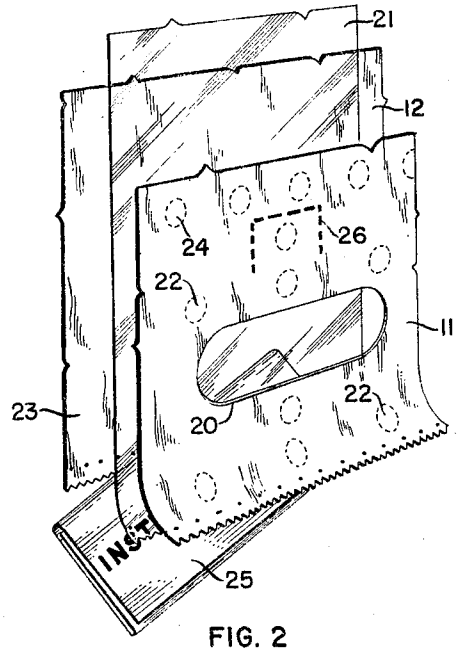

FIG. 2

MULTI-PLY BAG AND PROCESS FOR THE MANUFACTURE THEREOF

Filed March 30, 1965 4 Sheets-Sheet 2

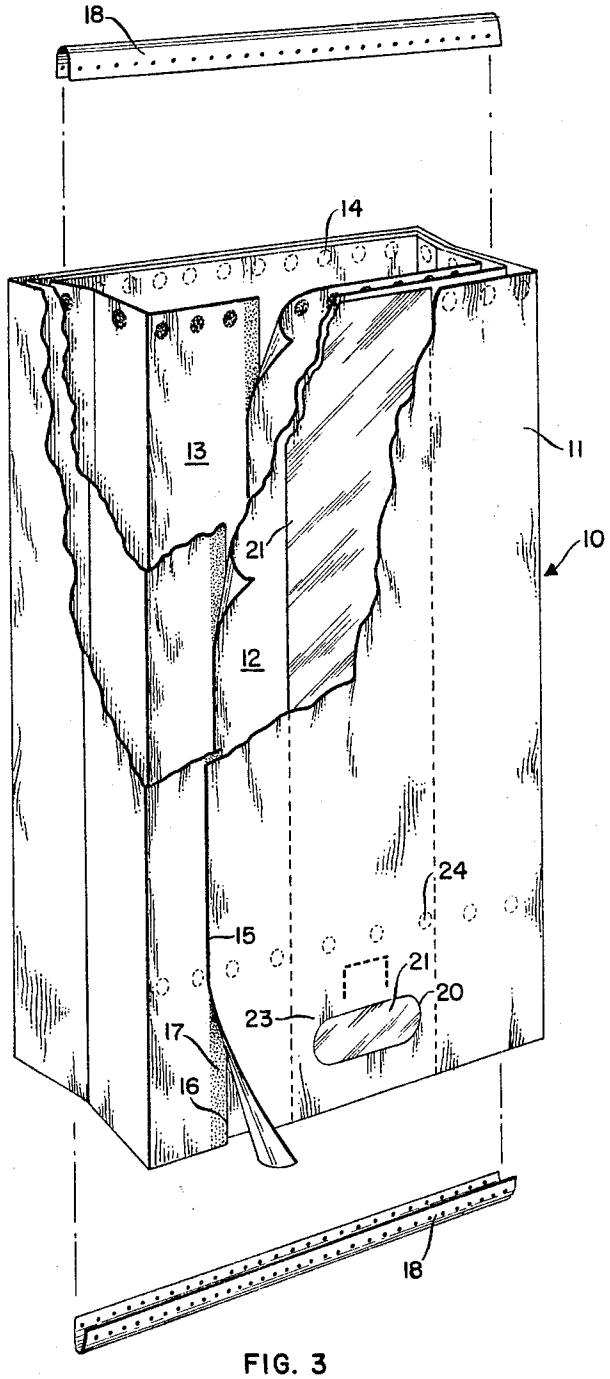

FIG. 3

MULTI-PLY BAG AND PROCESS FOR THE MANUFACTURE THEREOF

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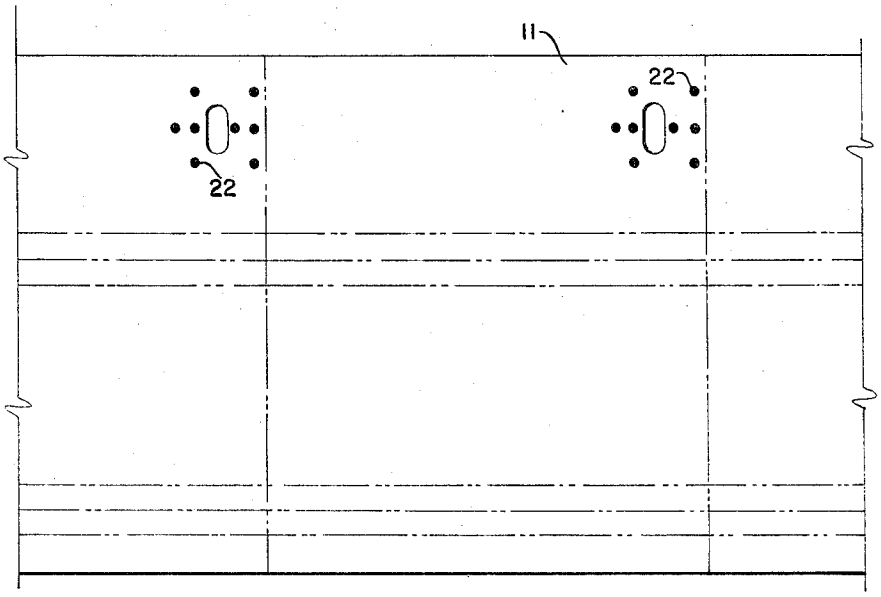

FIG. 4

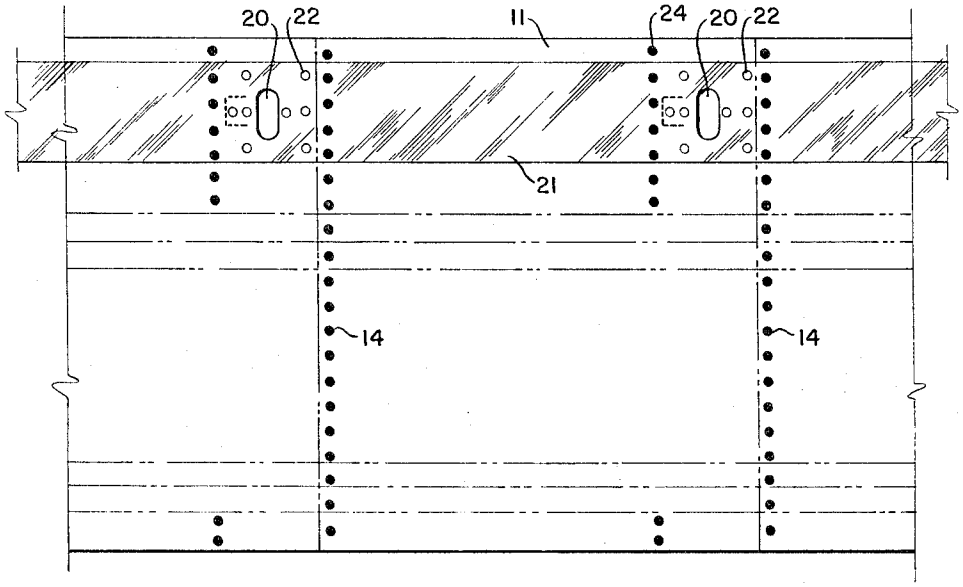

FIG. 5

MULTI-PLY BAG AND PROCESS FOR THE MANUFACTURE THEREOF

Filed March 30, 1965 4 Sheets-Sheet 4

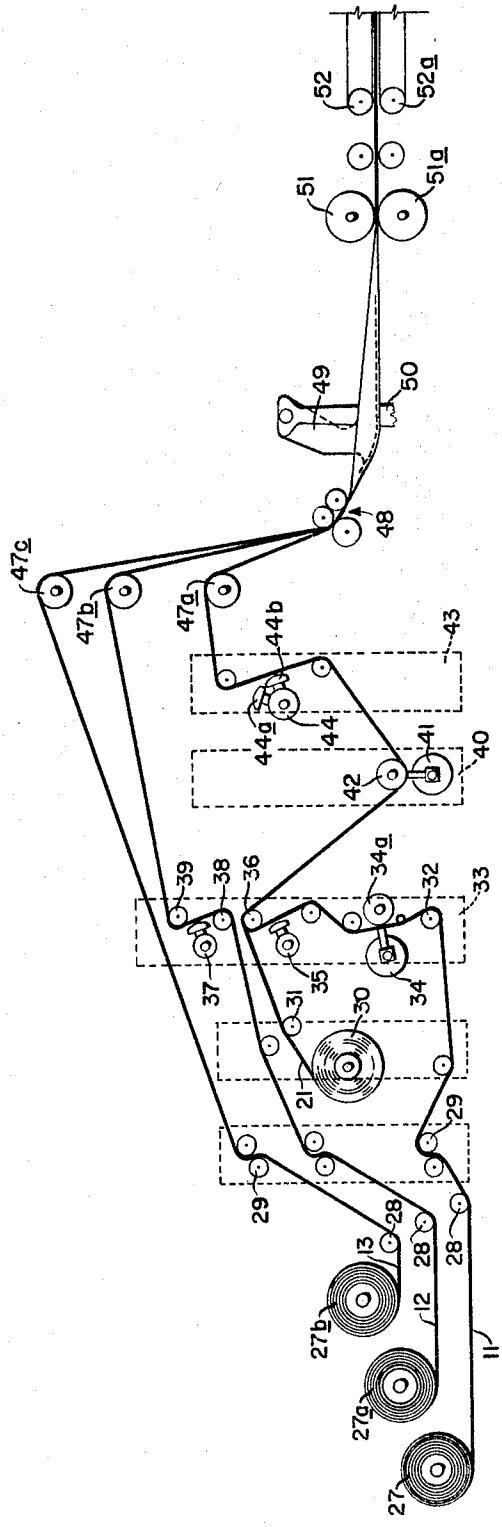

FIG. 6

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MULTI-PLY BAG AND PROCESS FOR THE MANUFACTURE THEREOF

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2 Claims. (Cl. 229—55)

This invention relates to a multi-ply bag and to a process for the manufacture thereof. More specifically, the invention relates to a multi-ply bag having a pocket compartment, which compartment has a window for viewing the pocket's contents.

It is often desirable to supply separate printed material (pamphlets giving instructions on use of lawn fertilizer, weed killer, etc.) along with the commodity packaged in a multi-ply bag. Often the separate printed matter is merely placed in the bag and the contents placed on top of the printed material. This causes the printed matter to be damaged or at least difficult to find when the bag is opened. One solution to the problem is found in the multi-ply paper bag described in U.S. Patent No. 2,867,372, issued to Richard M. Fox on January 6, 1959 for "Bag Structure With Pocket." The bag described in the above-noted patent provides a pocket between the plies of the bag, which pocket is accessible through a tear tab to withdraw the printed material from the pocket. However, it has been found that customers often do not notice the legend on the bag referring to the enclosed material, and consequently do not follow the instructions provided by the written material. It is desirable to provide a multi-ply bag with a pocket structure for printed material which will bring the enclosed printed material to the customer's attention in order that he will avail himself of the directions contained thereon.

Therefore, it is an object of this invention to provide a multi-wall bag having a pocket structure which is provided with a window overlying the pocket.

It is also an object of this invention to provide a process for the manufacture of a multi-ply bag having a pocket compartment with overlying window.

The multi-ply bag of the present invention includes a plurality of concentrically-arranged tubular plies of material. The outer ply of material has a window opening provided adjacent one end. A sheet of transparent material is positioned over the window opening between the outer ply and the next innermost ply. Means are provided for attaching the transparent material to the outer ply. Transversely extending means attach the outer ply to the next innermost ply between the window opening and the end of the bag which is opposite to the adjacent end. The outer ply and the next innermost ply, together with the attaching means, provide a pocket compartment in one end of the bag which is adapted to receive and retain an object that can be viewed through the window opening.

The process of the present invention for forming a multi-ply bag includes the steps of advancing at least two spaced-apart webs of sheet material, one of which webs is to be formed into the outer ply and the other of which webs is to be formed into the innermost ply of the bag. A window opening is cut in the outer ply web and a transparent sheet of material is attached over the window opening. The outer ply web is then joined to the next innermost ply web along a transversely extending line adjacent to the window opening. The two opposite side edges of the outer ply web are joined to each other and the two opposite side edges of the next innermost ply web are also joined to each other to form a plurality of concentrically-arranged tubes. The tubes are then flattened and severed into bag lengths such that the window opening is adjacent to one end of the bag length and between the adjacent end and the transversely extending line joining the outer ply web and the next innermost ply web. One end of the bag length is then closed to form the multi-ply bag.

The foregoing, and other objects, features and advantages of the present invention will be apparent from a consideration of the following specification taken in connection with the accompanying drawings in which like reference characters designate the same or similar parts throughout the several views.

In the drawings:

FIGURE 1 is an elevational, perspective view of an exemplary multi-ply bag of the present invention;

FIGURE 2 is enlarged, partial, sectional, exploded view of the area adjacent the window in the bag of FIGURE 1;

FIGURE 3 is an elevational, perspective view of an exemplary multi-ply bag with portions removed;

FIGURE 4 is a plan view of a portion of the web which forms the outer ply of the multi-ply bag;

FIGURE 5 is a plan view similar to FIGURE 4 showing the arrangement of the transparent window covering on the outer ply web; and

FIGURE 6 is a schematic, side elevational view of a bag forming machine adapted for carrying out the process of the present invention.

Referring now to FIGURES 1 and 3, the multi-ply bag of the present invention, designated generally by the numeral 10, includes an outer ply 11, intermediate ply 12 and an inner ply 13. However, it is understood that the bag may only contain two plies or any number of plies in addition to the three shown in the drawings. Bags with up to six plies can be readily made on conventional machines. The bag may be formed of any material capable of fabrication into a multi-ply bag, e.g., paper, plastic or other suitable material. As seen more clearly in FIGURE 3, the plies of the bag are concentrically arranged to form a bag length wherein the plies are affixed to one another by means of dots of adhesive 14 adjacent one end of the bag. Additional dots of adhesive may be affixed to the opposite end of the plies, if desired. The various plies of the bag are made from flat webs of material by joining the opposite edges 15 and 16 by means of a line of adhesive 17. The seamed portions of each ply are stepped one from another in a transverse direction in order that the thick seam portions will not overlie one another. The bag length is closed on one or both of its ends by means of a length of tape 18, which may be of any suitable material such as paper or plastic, affixed to the ends of the bag by means of a line of thread stitching 19. While the bag is shown with both ends stitched closed, it is understood that normally the bag will be manufactured with only one end stitched closed. After filling, the customer will normally close the other end with a line of stitching and tape.

The outer ply 11 of the bag is provided with a window opening 20 adjacent one end thereof. The window opening may be conveniently formed by die cutting a portion of the outer ply. While the opening shown in the several views is generally oval, it is understood that the opening may be of any desired shape. The window opening 20 is covered by a sheet of transparent material 21. This transparent material may be any suitable sheet material such as cellophane, polyethylene, polypropylene, and the like. However, if desired, the window may be of a translucent material if it is desired only to show the color of the printed material in the pocket.

Referring now to FIGURE 2, the sheet of transparent material 21 is attached to the inner surface of the outer ply 11 by means of spaced dots of adhesive 22 positioned in a line above and below the window opening 20. As

seen in both FIGURES 3 and 5, the sheet of transparent material **21** extends the full length of the bag.

The pocket compartment of the bag **23** is provided between the outer ply **11** and the next innermost ply **12** adjacent one end of the bag **10**. As seen in FIGURES 2 and 3, the compartment **23** is formed by gluing the outer ply **11**, the transparent strip **21**, and the inner ply **12** together by means of a transversely extending line of adhesive **24** positioned immediately below the window opening **20**. While the adhesive **24** that glues the outer and inner ply together is shown in the form of a series of spaced dots, it is understood that a solid line of adhesive may be used, if desired.

As shown in FIGURE 2, the pamphlet of printed material **25** is inserted in pocket compartment **23** through the opening in the outer ply **11** and next innermost ply **12**. After the printed material **25** is inserted in the bag, the bag is then closed by means of the tape **18** and a line of thread stitching **19**. The pamphlet of printed material may be inserted by either the bag manufacturer or by the bag customer who fills the bags. If it is desired that the material be located in a pocket adjacent the factory sealed end of the bag then the bag manufacturer places the material in the pocket compartment prior to sewing the lower end of the bag closed. However, if desired, the pocket may be located adjacent the normally open end of the bag and the pamphlet of printed material placed in the pocket compartment of the bag prior to filling the bag by the bag customer.

If desired, the plies of the bag beneath the window may be cut through so that the contents of the bag may also be viewed through the window. In this construction the printed material may be printed on a stock which is itself transparent so that it will not block the view of the contents of the bag when it is filled.

Optionally, there may be provided a line of perforations **26** through the outer ply **11** and adjacent sheet of transparent material **21**. This line of perforations defines a thumb pull down tab which may be conveniently broken in order to rip the outer ply of the bag to obtain access to the pamphlet of printed material in the pocket compartment **23**.

The process aspect of the present invention may be carried out on any conventional tube-forming apparatus adapted to produce multi-ply paper bags. Such tuber machines are well known in the art and do not require detailed description. Referring now to FIGURE 6 the schematic representation of a tuber machine is shown modified to perform the process steps necessary to produce the bag of the present invention. Three rolls of web material such as kraft paper are held by roll stands (not shown). The web forming the outer ply **11** is drawn from roll **27**, the intermediate web **12** is drawn from roll **27***a*, and the innermost ply **13** is drawn from roll **27***b*. Each of the webs **11**, **12** and **13** pass over the dancing rolls **28** and web guides **29**. A roll of transparent material **30** supplies the strip of transparent material **21** which passes over a guide roll **31**. The outer ply web **11** turns upward over guide roller **32** mounted at the lower end of support member **33** and passes between the window cutting rollers **34** and **34***a*. Roller **34** has a die cutting head mounted thereon which presses against the surface of mating roller **34***a* to cut windows at spaced intervals along the length of outer ply web **11**. A rotating cross paster **35** applies a pattern of dots of adhesive **22** to the area adjacent the window opening **20**, as may be seen more clearly in FIGURE 4. The outer ply **11** and the sheet of transparent material **21** are brought together at the surface of guide roller **36**. As seen in FIGURE 5 the dots of adhesive **22** affix the sheet of transparent material **21** firmly to either side of the window opening **20** provided in the outer ply web **11**.

At the upper end of support member **33** a rotating cross paster **37** is mounted between rollers **38** and **39** which guide the intermediate ply **12**. The cross paster **37** applies the transversely extending line of adhesive dots **14** which join the intermediate ply to the outer ply **13**. The use of cross paster **37** is optional since the bag of the present invention may be constructed from concentric tubes which are not joined by any adhesive.

Support member **40** has mounted thereon a thumb notch cutting roller **41** having a die cutting head which engages roller **42** to provide the thumb tab perforations **26** in the outer ply **11** and transparent sheet material **21**. This operation is also optional and may be dispensed with if it is not desired to provide the thumb notch perforations in the bag of the present invention.

Support member **43** carries a rotating cross paster **44** which has two heads **44***a* and **44***b*. Head **44***a* applies a transverse line of adhesive in the form of dots **45** to the inner surface of the outer ply web **11**, as may be seen more clearly in FIGURE 5. Head **44***b* applies a short transverse line of dots of adhesive **24** across a portion of the outer ply **11** and the sheet of transparent material **21**. The dots of adhesive **24**, as may be seen more clearly in FIGURES 2 and 5, provide the means joining the outer ply **11** and intermediate ply **12** together to provide the pocket compartment **23** between these two plies.

The longitudinal pasters **47***a*, **47***b* and **47***c* each apply a line of adhesive (not shown) to one edge portion of the outer ply **11**, the intermediate ply **12**, and the inner ply **13**, respectively.

The three webs with the adhesive applied thereto, pass under a series of guide rollers, designated generally **48**, and then contact the mandrel **49** supported on member **40**. The webs are folded around mandrel **49** in the conventional manner into concentrically aligned tubes. Opposite edges of each of the webs are brought together and overlapped to join these edges by means of adhesive **16**, as may be seen more clearly in FIGURE 3. The concentrically aligned webs then pass to the flattening rollers **51** and **51***a* where the tube is flattened and the adhesive seams firmly pressed together. Drive rollers **52** and **52***a* pull the formed bag tube through the tube forming machine. A conventional cutter mechanism (not shown) is utilized to sever the bag tube into suitable bag lengths. Also, it will be understood that conventional bag sewing machinery (not shown) is utilized to close one or more ends of the bag with the tape **18** and line of thread stitching **19**.

Modifications may be made to both the bag and the process of the present invention without departing from the spirit and scope of the present invention. While the bag illustrated in the drawings in a gusseted bag, it is understood that the present invention may be utilized to produce a non-gusseted, or flat tube bag. Further, it is understood that the present invention may be utilized in producing a valved bag, i.e., one having both ends sewn closed at the factory and provided with a folded valve insert in the side of the bag whereby the bag may be filled by the customer. Other modification and variations will be apparent to those skilled in the art and such modifications and changes may be made without departing from the essence of the invention. It is intended to cover herein all such modifications and changes as come within the true scope and spirit of the claims.

What is claimed is:

1. A multi-ply bag comprising:

(a) a plurality of concentrically arranged tubular plies of material;

(b) the outer ply of material having a window opening provided adjacent one end;

(c) a sheet of transparent material positioned over said window opening between said outer ply and the next innermost ply of material, said sheet being in the form of a strip extending over the length of said tubular plies;

(d) adhesive means attaching said sheet of transparent

material to said outer ply adjacent to said window opening;

(e) transversely extending adhesive means attaching said outer ply and said sheet of transparent material to said next innermost ply between said window opening and the end opposite said adjacent one end, said outer ply and said next innermost ply together with said adhesive attaching means providing a pocket in one end of said bag adapted to receive and retain an object which can be viewed through said window opening; and

(f) means closing said tubular plies of material at one end thereof to form said multi-ply bag.

2. A multi-ply bag as defined in claim 1 wherein said outer ply of material and said sheet of transparent material are provided with a line of adjacent registering

perforations adjacent said window opening, said perforations defining an area adapted for use as a pull-down tab to gain easy access to said pocket.

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