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Long et al.

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[45] **Nov. 5, 1974**

[54] **METHOD OF MANUFACTURING A SHIPPING BAG**

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[21] Appl. No.: **377,317**

Related U.S. Application Data

[62] Division of Ser. No. 185,708, Oct. 1, 1971, Pat. No. 3,770,189.

[52] **U.S. Cl.** ..... **93/35 R,** 93/1 E, 93/35 SB

[51] **Int. Cl.** **B31b 49/04**

[58] **Field of Search** ..... 93/35 R, 35 SB, 27, 31, 93/1 A, 1 E, 1 TS

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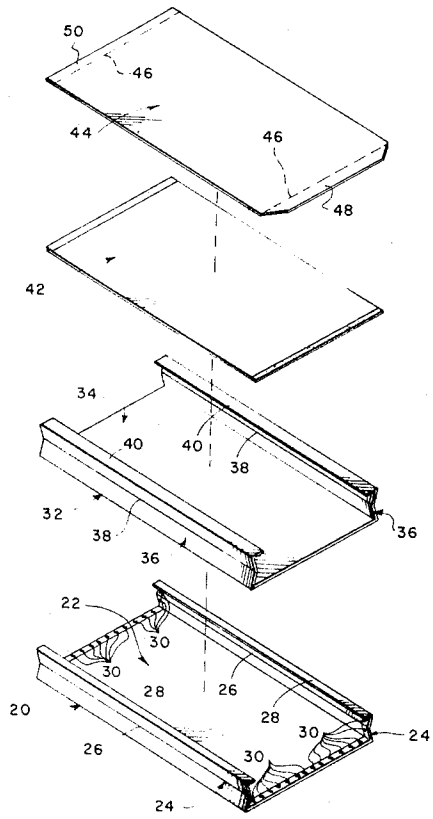
Primary Examiner—Roy Lake
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Attorney, Agent, or Firm—Richards, Harris & Medlock

[57] **ABSTRACT**

A shipping bag for mattresses and similar articles is formed from a two-ply tube including front and back walls and side walls comprising inwardly projecting gusset folds. The outer ply of the front wall extends beyond the remaining plies to form endwise projecting lips. One of the lips is folded over the corresponding ends of the side walls and the back wall and is secured to the outer ply of the back wall to form a closed end. The corners of the front and back walls at the closed end are then folded inwardly and are secured in the gusset folds of the side walls.

Upon completion of the foregoing steps, an article is inserted into the bag. The ends of the side walls and the back wall at the open end of the bag are then folded inwardly and the lip at the open end is secured to the outer ply of the back wall to close the bag. In a second embodiment of the invention, threads are secured in the corners of the outer ply of the bag to prevent tearing.

9 Claims, 11 Drawing Figures



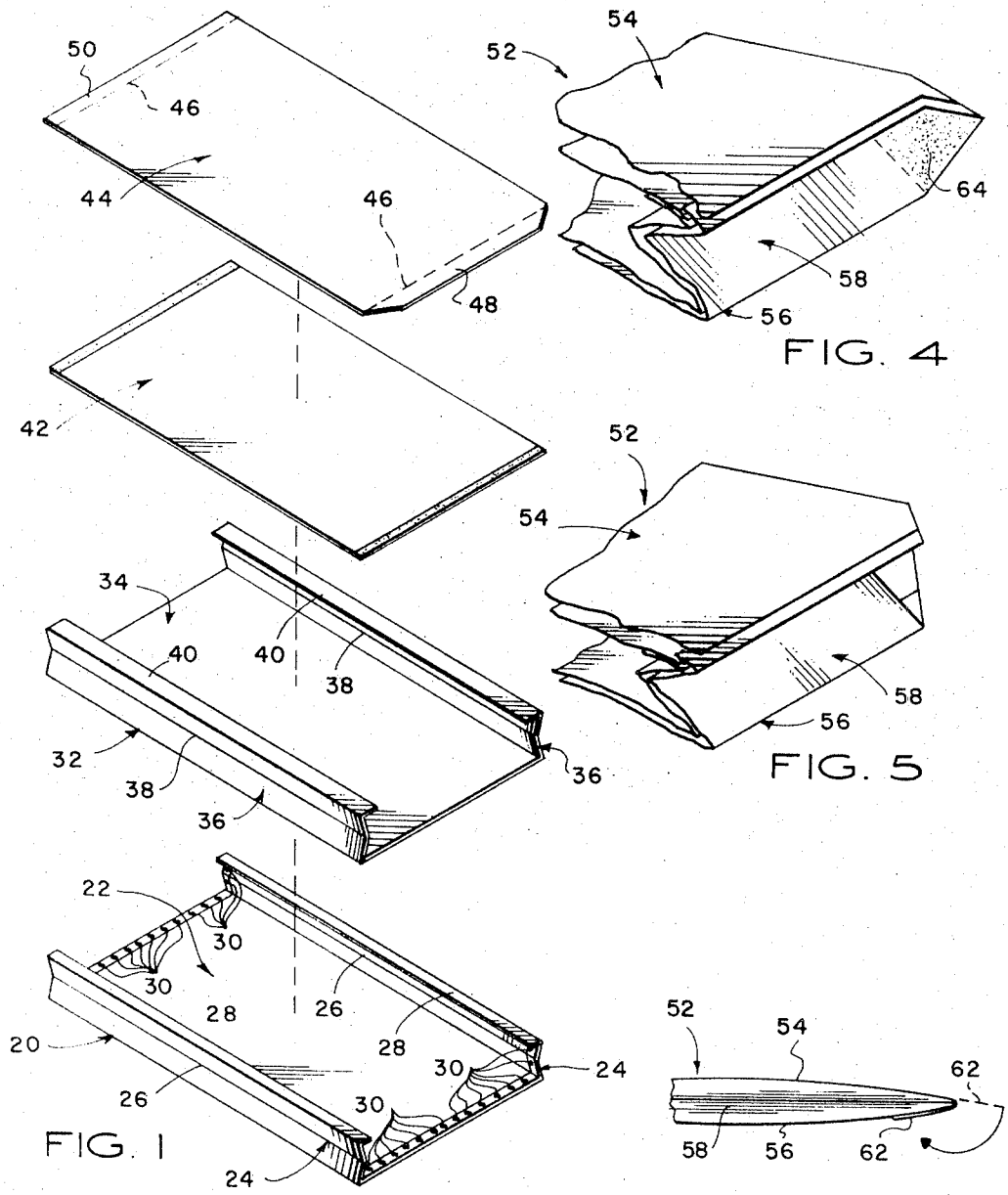


FIG. 1

FIG. 4

FIG. 5

FIG. 3

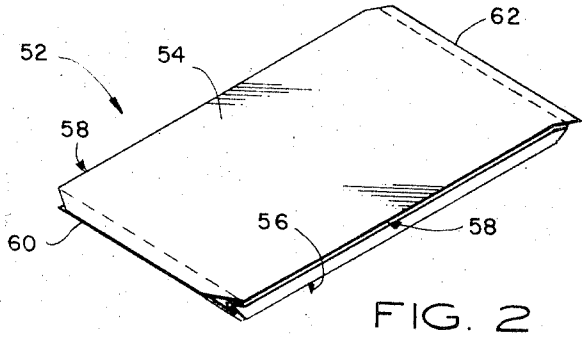


FIG. 2

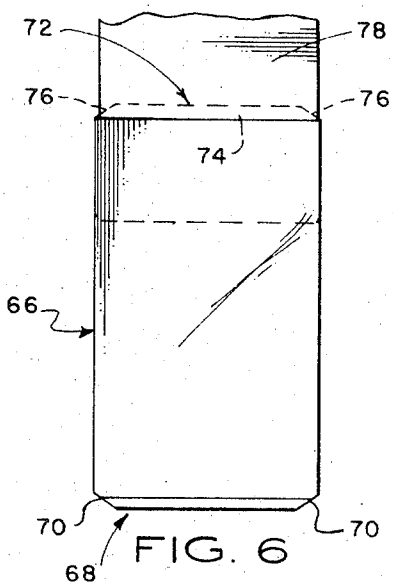


FIG. 6

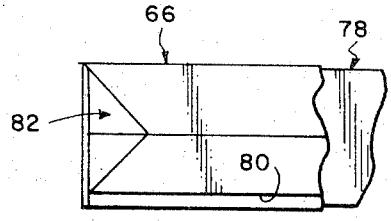


FIG. 7

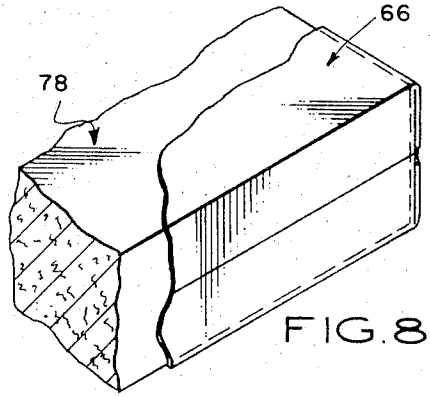


FIG. 8

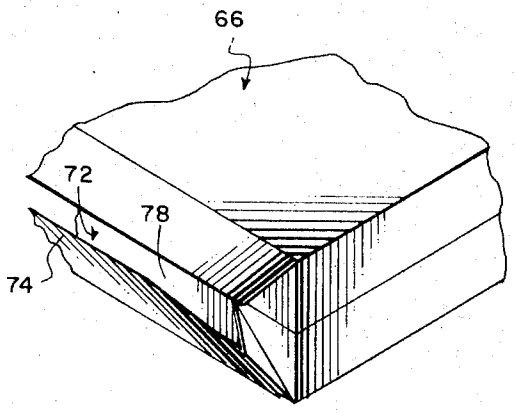


FIG. 9

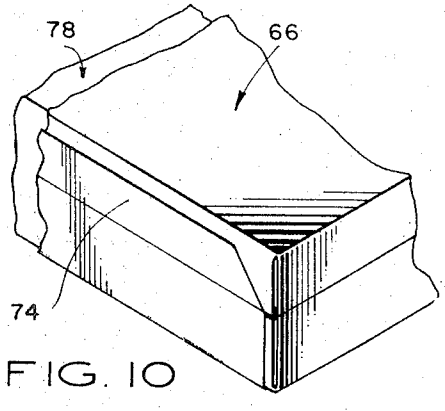


FIG. 10

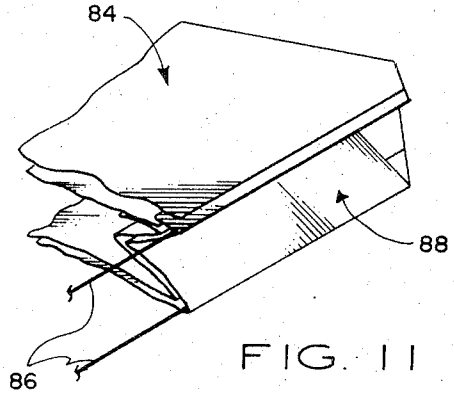


FIG. 11

METHOD OF MANUFACTURING A SHIPPING BAG

This is a division of application Ser. No. 185,708, filed Oct. 1st, 1971, now U.S. Pat. No. 3,770,189.

BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates to a shipping bag and method of manufacture, and more particularly to a bag for use in the transportation of mattresses and similar articles and to a method of making the bag.

Whenever bags are employed to protect mattresses, box springs and the like during transportation in Interstate Commerce, ICC Regulations dictate the use of paper having a total basis weight of at least 140 pounds in the construction of the bags. This requirement is usually satisfied by providing a two-ply bag in which the inner ply is formed from 40 pound basis weight paper and in which the outer ply is formed from 100 pound basis weight paper. The type of bag that is most often used is the automatic or SOS (self-opening style) bag. Such a bag is identical to that used in grocery stores and the like in that it comprises a square bottom and gusseted side walls.

Through experience, it has been found that the automatic bag is not wholly satisfactory insofar as the protection of mattresses, box springs and similar articles is concerned. First, notwithstanding the "automatic" construction, it is often quite difficult to open the bottom of such a bag during the insertion of a mattress therein. Second, the inherent structural characteristics of an automatic bag require the use of a glue joint between the layer of 40 pound paper and the layer of 100 pound paper in order to seal the bag. This is unsatisfactory in that it does not provide the high strength joint that could be formed if the layer of 100 pound paper could be joined directly to itself. Finally, the bags of the automatic variety often incorporate a glue joint which extends completely through both the layer of 40 pound paper and the layer of 100 pound paper. This forms a stiff layer at the joint which is highly inflexible and is therefore apt to contribute to splitting of the bags and to poor sealing of the end closures.

The present invention relates to a novel bag which is particularly adapted to the protection of mattresses, box springs and similar articles, and to a method of making the bag. In accordance with the preferred embodiment of the invention, a bag comprises opposed front and back walls and a pair of side walls extending between the front and back walls and having a pair of inwardly projecting gusset folds formed therein. The ends of the front wall extend beyond the ends of the back wall and the side walls in the form of endwise projecting lips. One lip is folded over the corresponding ends of the side walls and the back wall and is secured to the outer surface of the back wall to close one end of the bag. The corners of the closed end are then folded into the gusset folds of the side walls and are secured therein.

In the use of the bag, a mattress or similar article is inserted through the open end of the bag and is fully seated into the closed end of the bag. This opens the bag to a configuration corresponding to that of the mattress. The corners at the open end are then folded inwardly, and the lip at the open end of the bag is secured to the outer surface of the back wall to completely seal the bag. By this means the mattress is completely enclosed by a bag in which the outer layer is joined to itself and comprising no thick glue joints or other inflexible portions.

DESCRIPTION OF THE DRAWINGS

A more complete understanding of the invention may be had by referring to the following Detailed Description when taken in conjunction with the accompanying Drawings, wherein:

FIG. 1 is an exploded view illustrating the initial steps in a method of making a shipping bag incorporating the invention;

FIG. 2 is a perspective view showing the result of the steps illustrated in FIG. 1;

FIG. 3 is an enlarged partial side view illustrating the steps involved in closing one end of the bag;

FIGS. 4 and 5 are enlarged partial perspective views illustrating the steps involved in folding the corners of the closed end of the bag;

FIG. 6 is a reduced front view illustrating the insertion of a mattress into the bag;

FIGS. 7 and 8 are partial perspective and partial end views, respectively, illustrating the shape assumed by the bag after the insertion of a mattress therein;

FIGS. 9 and 10 are partial perspective views illustrating the steps involved in closing the opposite end of the shipping bag; and

FIG. 11 is a partial perspective view illustrating a shipping bag comprising an alternative embodiment of the present invention.

DETAILED DESCRIPTION

Referring now to the Drawings, and particularly to FIG. 1 thereof, there is shown the initial steps in a method of making a shipping bag which incorporates the present invention. The bag includes an outer back portion **20** which comprises a back wall **22** and a pair of side walls **24**. Each side wall **24** comprises an inwardly projecting gusset fold **26** and extends to an inwardly projecting edge **28**. A plurality of glue spots **30** are formed along the opposite ends of the back wall **22** and the side walls **24**. The outer back portion **20** is preferably formed from a relatively high strength material, for example, 100 pounds basis weight paper.

The bag further includes an inner back portion **32** which is constructed similarly to the outer back portion **20** in that it comprises a back wall **34** and a pair of side walls **36**. Each side wall **36** comprises an inwardly projecting gusset fold **38** and extends to an inwardly projecting edge **40**. The inner back portion **32** is equal in length to the outer back portion **20** and is preferably formed from a material which cooperates with the material of the outer back portion **20** to meet ICC regulations regarding shipping bags for mattresses and the like. Thus, if the outer back portion **20** is formed from 100 pound basis weight paper, the inner back portion **32** could be formed from 40 pound basis weight paper.

In the manufacture of the shipping bag, the inner back portion **32** is nested into the outer back portion **20** with the ends of the inner back portion positioned in alignment with the ends of the outer back portion and with the gusset folds **26** of the outer back portion extending into the gusset folds **38** of the inner back portion. When the inner back portion **32** is properly positioned, it is secured to the outer back portion **20** by means of the glue spots **30** which function to bond the

ends of the back wall 34 and the side walls 36 of the inner back portion 32 to the ends of the back walls 22 and the side walls 24 of the outer back portion 20.

After the inner and outer back portions are joined, a front wall 42 is secured to the edges 40 of the inner back portion 32. The front wall 42 is equal in length to the inner back portion 32 and to the outer back portion 20 and is formed from the same material as the inner back portion 32. The front wall 42 may be joined to the edges 40 of the inner back portion 32 by forming a plurality of glue spots along the edges 40, or by hot-melt sealing, or by any of the other techniques that are commonly employed in the bag manufacturing industry to join the walls of bags.

After the inner front wall 42 has been joined to the edges 40 of the inner back portion 32, an outer front wall 44 is joined to the edges 28 of the outer back portion 20. The outer front wall 44 is formed from the same material as the outer back portion 20 but is longer in length than the outer back portion 20. This increased length of the outer front wall 44 is indicated by the dashed lines 46 in FIG. 1. This provides a pair of endwise projecting lips including a lip 48 having inwardly beveled or clipped edges and a lip 50 having square edges. The outer front wall 44 may be joined to the edges 28 by any of the commonly employed techniques, such as by forming a plurality of glue spots along the edges 28, by hot-melt sealing, etc.

The result of the foregoing steps is illustrated in FIG. 2 wherein a partially finished shipping bag 52 constructed in accordance with the present invention is shown. The bag 52 comprises a two-ply tube which includes a generally planar front wall 54, a generally planar back wall 56, and a pair of inwardly gusseted side walls 58. The outer ply of the front wall 54 projects from each end of the remainder of the bag 52 in the form of a lip 60 having inwardly beveled corners and a lip 62 having square corners.

Referring now to FIG. 3, the next step in the method comprises the closure of the end of the partially finished bag 52 including the square-cornered lip 62. As is clearly shown in FIG. 3, this is accomplished by folding the lip 62 from the position illustrated in dashed lines over the ends of the inner ply of the front wall 54, over the ends of the gusset folds of the side walls 58, and over the ends of both plies of the back wall 56, and then securing the inner surface of the lip 62 to the outer surface of the outer ply of the back wall 56. The securing step may be carried out by means of any of the techniques commonly employed in the bag manufacturing industry, such as hot-melt sealing, wet glue sealing, sewing, etc.

The next step in the method of manufacturing a shipping bag according to the present invention comprises forming beveled corners at the closed end of the partially finished bag. This is preferably accomplished in the manner illustrated in FIGS. 4 and 5. First, a layer of adhesive 64 is applied to the inner portions of the lower ends of the gusset folds comprising the side walls 58 of the partially finished bag 52. Then, the corners of the front wall 54 and the back wall 56 at the closed end of the bag are folded into the gusset folds of the side walls 58 in the manner illustrated in FIG. 5. During this folding action, the layer of adhesive 64 is doubled back upon itself, and therefore functions to securely retain the corners of the front and back walls in the gusset folds of the side walls throughout the use of the bag.

At the completion of the foregoing steps, the shipping bag according to the present invention is complete and ready for use. It is contemplated that all of the foregoing steps would be performed by a bag manufacturing company. In such a case, a plurality of the completed bags would be shipped to a mattress manufacturer for use. Of course, the shipping bags could be manufactured at the same plant as the mattresses, if desired.

The use of a shipping bag constructed in accordance with the present invention is illustrated in FIGS. 6-10. Referring particularly to FIG. 6, a completed bag 66 formed by means of the techniques illustrated in FIGS. 1–5 is shown. The bag 66 comprises a closed end 68 having beveled corners 70 and an open end 72 including a lip 74 having beveled corners 76. FIG. 6 also illustrates the insertion of a mattress 78 into the bag 66. One of the important aspects of the present invention is that the bag 66 need not be oriented in any particular manner and that there is no need to pre-open or otherwise prepare the bag 66 prior to the insertion of the mattress 78.

FIGS. 7 and 8 illustrate the closed end of the bag 66 after the mattress 78 has been fully seated in the bag. It will be noted that even though the bag 66 is not provided with a square end such as that characteristic of an automatic bag, the closed end of the bag 66 conforms very precisely to the configuration of the mattress 78. Referring particularly to FIG. 7, there is shown an edge 80 which corresponds to the end of the endwise projecting lip that was folded over the remainder of the partially finished bag to form the closed end of the bag 66. FIG. 7 also illustrates triangular corner portions 82 which formerly comprised the beveled corners 70 of the bag 66.

The closure of the opened end 72 of the bag 66 is illustrated in FIGS. 9 and 10. First, the side walls of the bag 66 are folded inwardly in the manner illustrated in FIG. 9. Then, the portion of the back wall of the bag 66 which extends beyond the end of the mattress 78 is folded over the inwardly folded portions of the side walls. Finally, the endwise projecting lip 74 is folded over the inwardly folded portion of the back wall of the bag 66. At this point, the inner surface of the lip 74 is secured to the outer surface of the outer ply of the back wall. This is preferably accomplished by means of a self-sealing adhesive, such as a self-sealing latex adhesive, which is preferably applied to the inner surface of the lip 74 and to the outer surface of the back wall during manufacture of the bag. When the latter technique is employed, it is merely necessary to press the lip 74 into engagement with the outer surface of the back wall, whereby the lip 74 is secured to the outer surface of the back wall in the manner illustrated in FIG. 10.

The bag closure technique just described comprises one of the most important features of the present invention in that it permits joinder of the relatively strong outer layer of the bag directly to itself. By this means a closure of maximum strength is achieved with a minimum of difficulty. It will be appreciated that the closure technique has utility regardless of the construction of the opposite end of the bag. It will also be appreciated that the closure technique can be practiced by securing a separate lip to the outer layer of a conventional bag, folding the side walls and the back wall of

the bag inwardly, and then securing the lip to the outer surface of the back wall.

Referring now to FIG. **11**, there is shown a bag **84** which comprises an alternative embodiment of the present invention. In general, the bag **84** is fabricated by steps identical to the steps illustrated in FIGS. **1-5** and is utilized in a manner identical to the manner illustrated in FIGS. **6–10**. The one difference in the bag **84** is that threads **86** formed from rayon or the like are glued into the corners of the side walls **88** of the outer back portion of the bag. It has been found that the use of threads in the corners of the bag materially reduces the possibility of damage to the contents of the bag by substantially eliminating any possibility of tearing the bag at the corners. It has also been found that if a tear should commence in any of the walls of such a bag, the tear can propogate to the corners but will not propogate further due to the presence of the threads.

Those skilled in the art will appreciate the fact that the present invention is capable of numerous modifications. For example, bags manufactured in accordance with the invention may be of single-ply construction and may be formed from materials other than paper, such as plastic, metal foil, etc. Bags incorporating the invention may also be provided with auxiliary structure, such as the padding that is commonly used in box spring bags. It will also be appreciated that bags comprising the present invention may be used for purposes other than the transportation of mattresses, box springs, and the like. For example, the present bag is useful in shipping wood paneling and other large rectangular items.

From the foregoing, it will be understood that the present invention comprises a bag including generally planar front and back walls and inwardly gusseted side walls, and further including a lip which extends from the front wall around the ends of the side walls and the back wall to close one end of the bag, and wherein the corners of the closed ends of the bag are folded inwardly. The bag further comprises a lip extending from the opposite end of the front wall for joinder to the back wall to seal the bag. The use of the invention is advantageous over the prior art in that bags constructed in accordance with the invention are both considerably cheaper to manufacture and considerably easier to use than any of the various types of bags that have been employed as shipping bags heretofore. Also, in the case of a multiple-ply-bag, the use of the present invention permits joining the outer layer to itself to seal the bag and eliminates the thick glued joints that have heretofore been characteristic of multiple-ply shipping bags.

Although preferred embodiments of the invention have been illustrated in the Drawings and described in the foregoing specification, it will be understood that the invention is not limited to the embodiments disclosed, but is capable of rearrangement, modification, and substitution of parts and elements without departing from the spirit of the invention.

What is claimed is:

1. A method of forming a bag including the steps of:

forming inwardly projecting gusset folds along the opposite edges of a back wall;

adhesively securing a front wall of longer length than the back wall to the edges of the gusset folds remote from the back wall with the front wall projecting beyond at least one end of the back wall and the gusset folds to form an endwise projecting lip;

adhesively securing the endwise projecting lip of the front wall to the outer surface of the back wall to form a bag having one closed end and one open end; and

folding and securing the corners of the closed end of the bag into the gusset folds.

2. A method of forming a bag including the steps of:

forming inwardly projecting gusset folds along the opposite edges of the back wall;

gluing a front wall of longer length than the back wall to the edges of the gusset folds remote from the back wall with the front wall projecting beyond at least one end of the back wall and the gusset folds to form an endwise projecting lip;

gluing the endwise projecting lip of the front wall to the outer surface of the back wall to form a bag having one closed end and one opened end;

folding the corners of the closed end of the bag into the gusset folds; and

gluing the interiors of the corners to the interiors of the gusset folds and thereby securing the corners within the gusset folds.

3. The method of forming a bag according to claim **2** wherein the step of securing a front wall to the edges of the gusset folds is further characterized by securing the front wall to the edges of the gusset folds with both ends of the front wall projecting beyond the ends of the back wall and the gusset folds and further including the subsequent step of securing the end of the front wall at the open end of the bag to the outer surface of the back wall to close the open end of the bag.

4. A method of making a bag including the steps of:

folding a lip extending from an end of the front wall of a tube comprising opposed planar front and back walls and opposed side walls each having an inwardly projecting gusset fold formed therein over the ends of the side walls and the back wall and securing the lip to the outer surface of the back wall to form a bag having one open end and one closed end; and

folding the corners of the front and back walls at the closed end of the bag inwardly and securing the inwardly folded corners in the gusset folds of the side walls.

5. The method of making a bag according to claim **4** including the additional step of securing threads in the corners of the tube which lie between the front and back walls and the opposed side walls.

6. A method of making a bag including the steps of:

forming a tube comprising opposed front and back walls and side walls extending between the front and back walls and each having an inwardly projecting gusset fold formed therein;

securing reinforcing threads in each of the corners between the front and back walls and the side walls to prevent tears from propogating through the corners of the bag; and

closing one end of the tube to form a bag.

7. The method of making a bag according to claim **6** wherein the tube forming step is further characterized by forming a tube having a lip which projects from one

end of the front wall and including the additional steps of folding the lip over the ends of the side walls and the back wall and securing the lip to the back wall to form a closed end, and folding the corners of the front and back walls at the closed end inwardly and securing the inwardly folded corners in the gusset folds of the side walls.

8. A method of making a bag including the steps of:

folding a lip extending from an end of the front wall of the tube comprising opposed planar front and back walls and opposed side walls each having an inwardly projecting gusset fold formed therein over the ends of the side walls of the back wall and gluing the lip to the outer surface of the back wall to form a bag having one open end and one closed end; and

folding the corners of the front and back walls at the closed end of the bag inwardly and gluing the inwardly folded corners in the gusset folds in the side walls.

9. A method of forming a bag including the steps of:

forming inwardly projecting gusset folds along the opposite edges of a paper back wall;

securing a paper front wall of longer length than the back wall to the edges of the gusset folds remote from the back wall with the front wall projecting beyond at least one end of the back wall and the gusset folds to form an endwise projecting lip;

securing the endwise projecting lip of the front wall to the outer surface of the back wall to form a bag having one closed end and one open end;

folding the corners of the closed end of the bag into the gusset folds; and

securing the interiors of the corner to the interiors of the gusset folds and thereby securing the corners within the gusset folds.

* * * * *