United States Patent

La Fleur

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[45] **May 9, 1972**

[54] **METHOD OF FORMING PRODUCT-FILLED BAG**

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[21] Appl. No.: **24,133**

[52] **U.S. Cl.**.....**53/14**, 53/37, 219/228, 229/54 R, 248/101

[51] **Int. Cl.**.....**B65b 61/17**, B65b 67/12, B65d 33/10

[58] **Field of Search**.....229/54, DIG. 6; 150/12; 53/14, 53/134, 37, 39; 93/35 H

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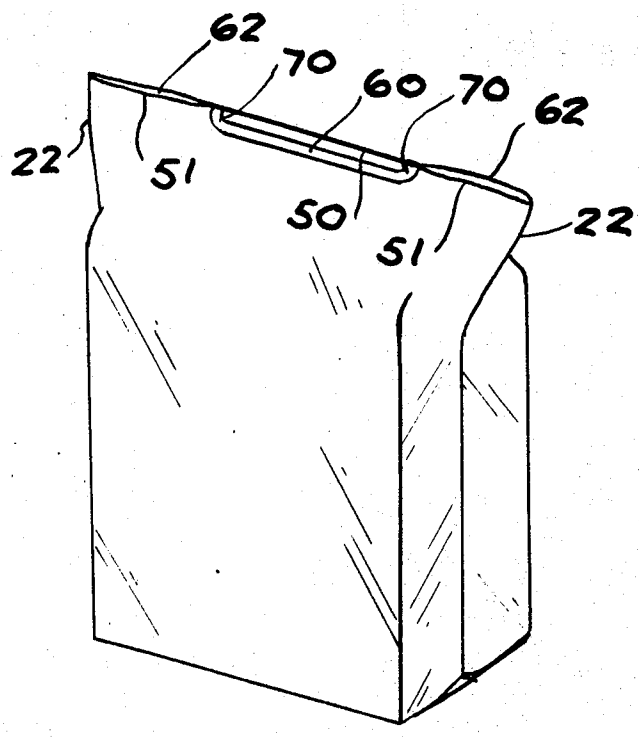
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[57] **ABSTRACT**

A commodity bag formed of a thermoplastic material, such as polyethylene, provided with gussets along each side and with reinforcing seams at the bottom to impart a square bottom to the bag when opened and which, after being filled with a commodity, has the central portion of its upper edges sealed together to form a handle for the bag.

10 Claims, 12 Drawing Figures



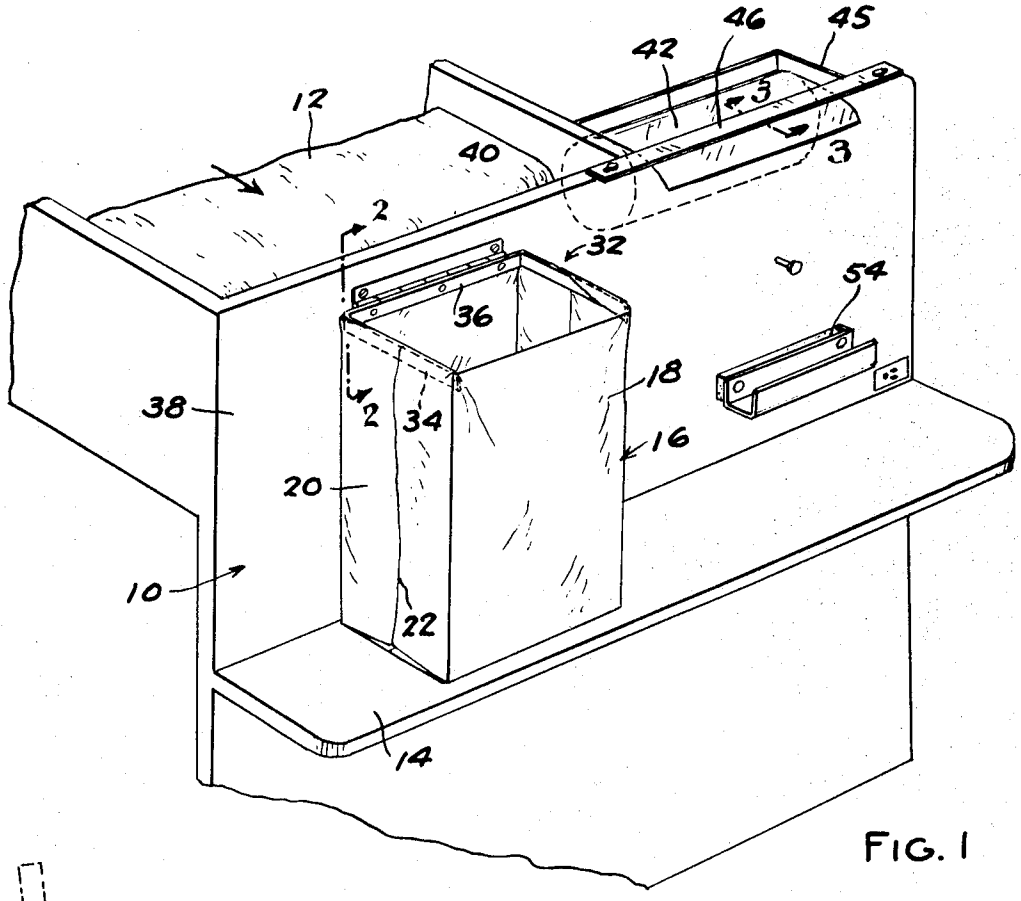


FIG. 1

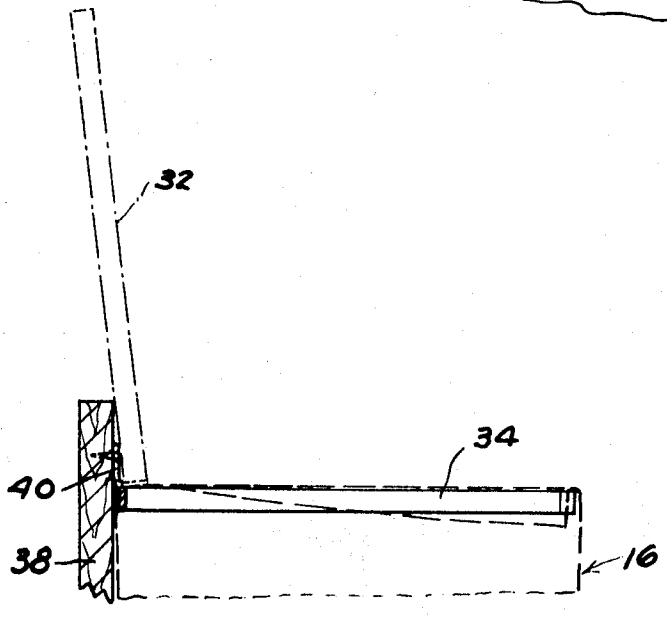


FIG. 2

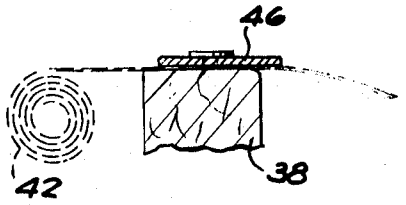


FIG. 3

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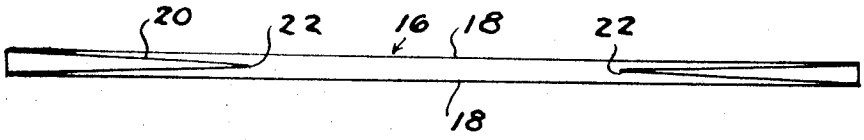


FIG. 4

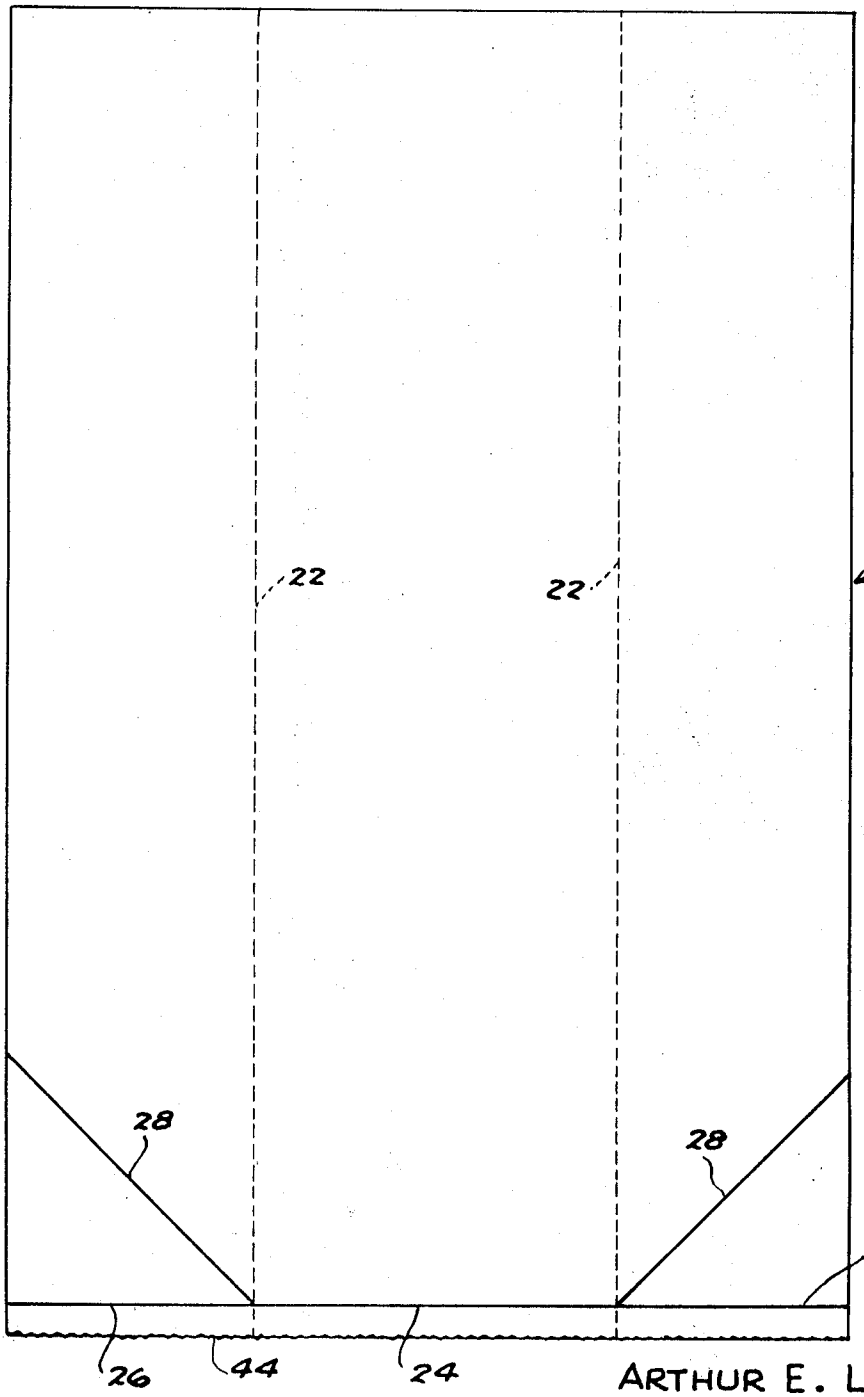


FIG. 5

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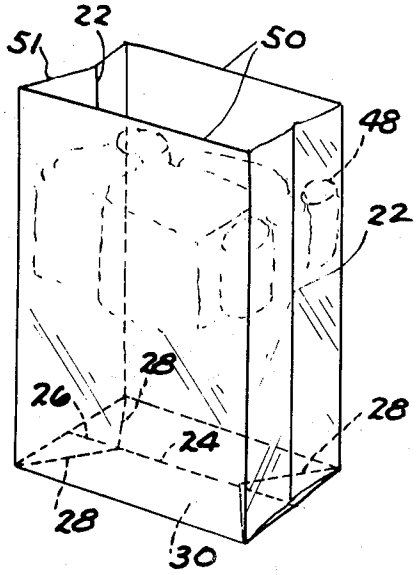


FIG. 6

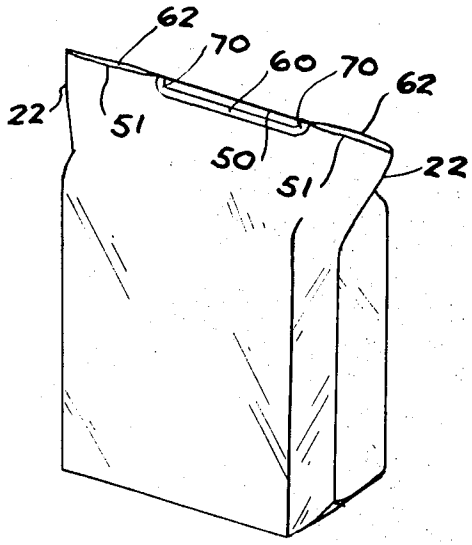


FIG. 7

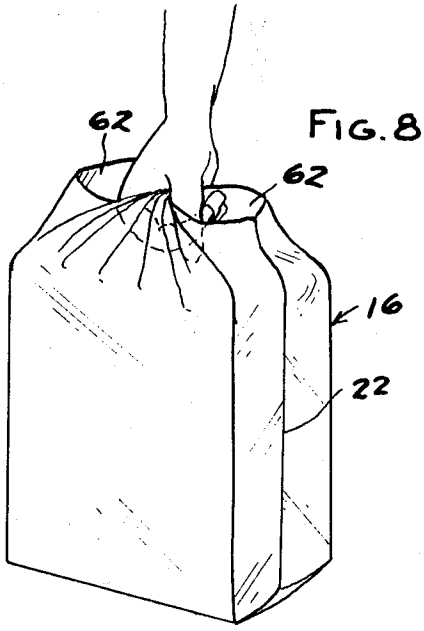


FIG. 8

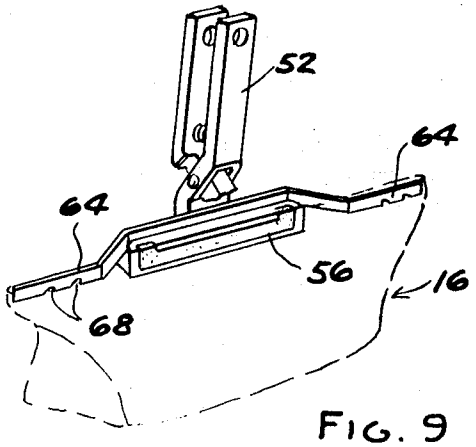


FIG. 9

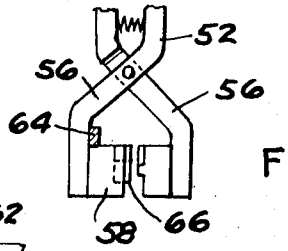


FIG. 10

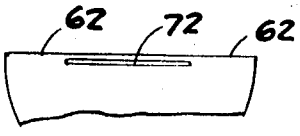


FIG. 11

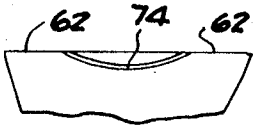


FIG. 12

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METHOD OF FORMING PRODUCT-FILLED BAG

This invention relates to a package and the method of forming the same and, more specifically, to a plastic bag filled with product and thereafter partially sealed along a central portion of its upper opposed edges to provide a handle for the filled bag.

In many fields of packaging the use of bags formed of thermoplastic film, such as polyethylene, has supplanted paper bags to a large extent. However, in the retail trade plastic bags have not appreciably supplanted the use of paper bags as the container in which the customer's purchases are packaged. The lack of extensive use of plastic bags in the retail trade for this purpose probably results in part from the fact that plastic bags as heretofore constructed would have to be formed of relatively heavy film to withstand the load to which such bags are frequently subjected, such as when bags are filled with groceries for example. The use of heavy film for such purpose would render the plastic bags relatively expensive in comparison to paper bags. Furthermore, plastic bags are not normally adapted to assume a free-standing, self-supporting, open position to facilitate loading thereof as is true of numerous types of paper bags.

While it is true that carrying bags formed of plastic and provided with integral handle portions have been proposed heretofore, such bags have not enjoyed wide commercial success. Normally the formation of integral handles in such plastic bags involves cutting away portions of the bag to provide such handles, thus reducing substantially the volume carrying capacity of the bag. Furthermore, such handles are of necessity narrow in width so as not to unduly reduce the size of the inlet opening for the bag and for this reason such integral handle portions are relatively weak unless the bag is formed of a heavy plastic film.

The present invention enables the use of bags formed of relatively thin plastic film for carrying relatively heavy loads and generally comprises the forming of an integral handle on the bag by partially sealing the upper open end of the bag after it is filled. The handle not only reinforces the bag to make it stronger, but also provides the bag with maximum carrying capacity for its size and does not in any way restrict the size of the open end of the bag when being filled with commodities.

One object of the present invention is to provide a method of packaging commodities, for example, groceries, in a plastic bag in a manner such as to produce a container capable of carrying a relatively large load in relation to the thickness of the plastic film from which the plastic bag is made and provided with a handle structure which is inherently sufficiently strong to support the load of the filled bag, which does not reduce the capacity of the bag and which is comfortable for the user to carry.

A further object of the present invention resides in a method of packaging commodities wherein a plastic bag is first filled with the commodities and is thereafter partially sealed along the central portion of its opposite upper free edges to provide a handle portion for the bag.

A further object of the invention resides in a support structure for retaining a plastic bag in an upright open position for facilitating filling the bag with commodities.

A still further object of the invention resides in the provision of a plastic bag filled with commodities and thereafter partially sealed along a portion of its upper free edges to provide a handle structure for the bag which strengthens the bag, reinforces its side walls and which at the same time prevents commodities from spilling out of the bag.

Further objects and advantages of the present invention will be apparent from the accompanying description and drawings, in which:

FIG. is a fragmentary perspective view of a sales check-out counter constructed for practicing the method of this invention.

FIG. 2 is a fragmentary sectional view along line 2—2 in FIG. 1 and showing the bracket structure for supporting a plastic bag in an upstanding open position.

FIG. 3 is a fragmentary sectional view along line 3—3 in FIG. 1 and showing a portion of the structure for dispensing the plastic bags one at a time from a supply roll of such bags.

FIG. 4 is a plan view of one form of bag adapted to be utilized in practicing the present invention, the bag being shown in the flat collapsed position.

FIG. 5 is a top end view of the bag shown in FIG. 4.

FIG. 6 is a perspective view of a plastic bag according to the present invention filled with commodities.

FIG. 7 is a perspective view of the bag illustrated in FIG. 6 and showing the handle formed thereon after the bag is filled.

FIG. 8 illustrates the manner in which the handle is utilized for carrying the filled bag.

FIG. 9 is a fragmentary perspective view illustrating a bag sealing tool and the manner in which it is used for forming the handle on the bag.

FIG. 10 is a fragmentary end view of the sealing tool.

FIGS. 11 and 12 are fragmentary views illustrating modified forms of handle structures.

Referring first to FIG. 1, there is illustrated an end portion of a sales check-out counter generally designated 10. The check-out counter preferably includes a conveyor 12 on which groceries or other commodities purchased by a customer are adapted to be placed and conveyed in the direction of the arrow shown in FIG. 1 to the end of the counter. A shelf 14 at the end of the counter is adapted to support the bottom of a plastic bag 16. While plastic bag 16 can take many forms, the preferable construction of the bag is that shown in FIGS. 4 and 5 and disclosed in my prior U.S. Pat. No. 3,143,277, dated Aug. 4, 1964.

As disclosed in the aforementioned patent, bag 16 is generally in the form of a seamless tube of thermoplastic film having opposed side panels 18 connected together by gusseted end panels 20. The line of folding of gusseted panels 20 is indicated at 22. Bag 16 has an open upper end and is closed along its lower end by a seal 24 which extends transversely across the lower end of the bag as shown in FIG. 4. Seal 24 between the fold lines 22 of the gusseted panels 20 is of double film thickness whereas the opposite end portions 26 of seal 24 at the portion thereof extending across the gusseted panels 20 are of four thicknesses of material. In addition, the lower end portion of the bag is also provided with diagonal seals 28 at the lower corners thereof. Each seal 28 integrally connects one of the panels 18 with the adjacent layer of the gusseted panel 20. The gusseted construction of the bag and the seal structure 24, 26, 28 at the lower end thereof enables the bag to be open to the condition shown in FIG. 6 wherein the bag has a generally rectangular cross section with a flat bottom 30.

Bags 16 are preferably formed as a roll 42 of such bags, the successive bags in the roll being separated by a score line 44 (FIG. 4) just below each bottom seal 24 of the bag. Supply roll 42 is arranged within a dispensing container 45 in counter 10 and the leading end of the roll extends between the upper edge of end wall 38 and a blade 46 which enables the bags to be successively separated from the supply roll by a slight lifting and tearing action.

In the counter structure shown in FIG. 1 the means provided for holding the bag in the upright open position comprises a U-shaped bracket 32 having opposed spring legs 34 connected by a strap 36 forming a bight portion. Bracket 32 is mounted on the upright wall 38 of the counter 10 by a hinge 40. As shown in FIGS. 1 and 2, bracket 32 is adapted to be pivoted from a horizontally extending, bag supporting position shown in FIGS. 1 and 2 to a generally upright position shown in broken lines in FIG. 2. As shown in FIG. 1 bracket 32 is dimensioned to correspond with the rectangular dimensions of bag 16 in horizontal section. Thus, the bight portion 36 has a length corresponding to the width of the side panel 18 and the legs 34 have a length corresponding to the width of the gusseted panel 20 when expanded.

After a bag 16 is separated from the supply roll 42, bracket 32 is pivoted to the generally upright position shown in broken lines in FIG. 2. The upper edge portion of the rear panel 18 of

the bag is stretched flat across wall **38** just below the horizontally extending axis of hinge **40**. With the bag manually held in this manner the operator then pivots bracket **32** downwardly with the index finger of each hand to clamp the upper edge portion of the rear panel **18** between the hinge and wall **38**. Thereafter, the operator runs his fingers forwardly along the upper edge of the panels **20** to open the bag. He then engages the upper front corners of the bag over the outer ends of legs **34** so that the bag is supported in the open upstanding position shown in FIG. **1** with its upper peripheral edge tautly engaged with bracket **32** and with its bottom **30** resting on shelf **14**. The bag can then be filled with the desired commodities such as generally indicated at **48** in FIG. **6**. It will be noted that the bag can be filled to a height spaced below the upper free edges of the bag only sufficient to enable the upper edges **50** of the front and rear panels **18** and the upper edges **51** of the end panels to be drawn flatwise together between fold lines **22**.

After the bag is filled in this manner it is in condition to be sealed. Referring to FIGS. **9** and **10**, the sealing tool preferably comprises a hand tool **52** normally retained in a support bracket **54** on the wall **38** of the counter. Tool **52** can take numerous forms of conventional electrically heated sealers, preferably of the impulse type. Tool **52** includes a pair of hingedly connected jaws **56**, at least one of which is provided with a heating element **58** which is adapted to be energized when the jaws are closed. In practicing the present invention it is essential that after the bag is filled with commodities a seal **60** is formed only partially along the upper free edges of the bag. Seal **60** is located and dimensioned in length so that a small opening **62** remains at each end of the seal **60**. Openings **62** need only be sufficiently large to permit a person to insert his fingers therethrough as shown in FIG. **8**. Accordingly, with the upper edges **50, 51** drawn flatwise together as shown in FIG. **7**, seal **60** is preferably located at the central portion thereof just below the free upper straight edges of the bag.

To facilitate centering of seal **60** between the fold lines **22**, the heat sealing tool **52** is provided with an extension **64** at one or both ends of one of the jaws **56**. Extension **64** preferably projects lengthwise beyond one jaw **56** in line with or slightly below the heating strip **66** of heating element **58**. In using tool **52** to form seal **60** the extension **64** is inserted between the upper edges **50, 51** of the bag with the end thereof engaging the upper edge of the bag generally at the fold line **22** of one of the gusseted panels. The operator then grasps the upper edge of the bag at the opposite fold line **22** and pulls the free edges **50, 51** of the bag between the jaws of the sealing tool. He then actuates the jaw to form the seal **60**. The length of extension **64** is such as to locate seal **60** centrally with respect to the free edges **50, 51** of the bag. In the event that the same sealing tool **52** is intended to be used with bags of various sizes, extension **64** is dimensioned in length to accommodate the largest bag and is formed with notches **68** along its lower edge adapted for hooked engagement with the fold lines **22** of smaller sized bags.

In the arrangement shown in FIG. **7** seal **60** is a generally straight seal with upwardly turned ends **70**. Other forms of seals that may be employed are shown in FIGS. **11** and **12**. In FIG. **11** seal **72** is generally the same as seal **60** but does not have the upwardly turned ends **70**. Seal **74** shown in FIG. **12** is generally arcuate in shape.

The partial seal at the upper end of the bag forms a natural handle for enabling the bag to be carried comfortably. Utilization of the seal as a handle is accomplished by gathering the upper edge of the bag along the seal and then inserting the fingers through both openings **62** and under the gathered seal so that the gathered portion of the edge extends across the palm of the hand in a natural manner. The length of the seal is preferably greater than the length of openings **62**. Gathering the sealed portion of plastic material in this fashion not only strengthens the handle but also imparts the effect of a handle of relatively large cross section which does not cut into the user's hand.

Experience has shown that with a handle of the type illustrated herein the bag is capable of supporting a relatively heavy load even though the film from which the bag is made is very thin. This results from the fact that the handle itself is relatively large by reason of the length of seal **60**. The reinforced seam structure at the bottom of the bag also contributes substantially to the load which the bag is capable of sustaining.

The handle construction for a plastic bag disclosed herein does not in any way interfere with the gusseted construction of the bag. This follows from the fact that the handle is formed after the bag is filled as distinguished from other plastic bag constructions having integral handles formed initially when the bag is fabricated and before it is filled. In such prior art arrangements the handles have to be relatively wide in order to have the required strength. On the other hand, the provision of relatively wide handles reduces the effective size of the opening at the upper end of the bag. In addition, the handle construction of the present invention enables substantially the entire volume of the bag to be utilized for carrying packages. Since the handle is formed after the bag is filled no cut-outs are required to impart a handle configuration to the upper end of the bag. Furthermore, after the bag is partially sealed at its upper end to form the handle, the open end of the bag is effectively closed to prevent products from spilling out of the bag even if the bag should accidentally fall over on its side. As pointed out previously, the openings **62** at opposite ends of seal **60** need only be sufficiently large to enable the user to insert his fingers therethrough. Since seal **60** extends across a very substantial portion of the upper edges **50** of the bag, the seal increases appreciably the resistance of the bag to lateral expansion at the upper ends.

To remove the products or commodities from the bag it is only necessary for the customer to grip the free edges **51** adjacent one end of the seal **60** and pull them apart. Since the bag is formed of a film having a thickness as small as 1 or 2 thousandths of an inch, it is relatively easy to tear the film along the handle seal and thus re-open the upper end of the bag completely to enable the removal of packages therefrom. Thus, even though a bag is partially sealed along its upper edges to provide a handle, the bag can be easily opened when desired so that it is reusable or usable as a trash bag, in which event it may be filled with rubbish or the like.

I claim:

1. The method of packaging commodities in a bag formed of a thermoplastic material, said bag being of the type having an open upper end defined by generally continuously straight upper free edges of the bag side walls which comprises first filling the bag with commodities and then bringing opposed central portions of said upper edges into mutually contacting relation and thereafter partially sealing the opposed contacting upper free edges of the bag in a direction lengthwise of said edges of the central portion thereof to thereby partially close the upper end of the bag at said central portion while leaving an opening at the upper end of the bag adjacent each end of the central sealed portion whereby the sealed central portion of said upper edges can be gathered to form a handle which is adapted to be manually encircled through said openings.

2. The method called for in claim **1** wherein said upper free edges of the bag extend continuously around the periphery thereof in a generally horizontal plane when the bag is in an upright open position and said sealing step is performed by drawing said opposed central portions of said free edges together in face-to-face relation over the commodities in the bag and heat sealing said portions together along a line spaced slightly below the juxtaposed free edge portions.

3. The method called for in claim **2** wherein said line of sealing is upwardly concave.

4. The method called for in claim **1** wherein the bag is filled with commodities to a level sufficiently below said upper free edges to enable said opposed central portions of said upper edges to be drawn together over the commodities therein in

face-to-face relation and said sealing is effected by heat sealing the juxtaposed central portions along a line spaced slightly below the opposed free edges of the bag.

5. The method called for in claim 4 wherein the length of the sealed edge portion is greater than the length of each of said openings measured in the direction lengthwise of the seal.

6. The method called for in claim 1 wherein the bag is generally rectangular in horizontal cross section when in an upright open position and comprises two opposite side walls and two opposite end walls, the side walls being wider than the end walls, said seal extending along a major portion of the upper edges of said side walls.

7. The method called for in claim 6 wherein the seal terminates at each end such that the major portion of the upper edges of said end walls remains unsealed and provides said openings.

8. The method called for in claim 1 wherein the open upper end of the bag is closed after filling by spreading apart opposite localized portions of said free edges so as to draw said opposite edges together in flatwise relation and thereby form the open end of the bag into a generally straight flat seam of double thickness having a length equal to half the peripheral dimension of the open end of the bag, said seal being formed along said straight flat seam and terminating at each end inwardly of the opposite ends of said seam to provide said openings.

9. The method called for in claim 8 wherein the length of said seal is greater than the length of each of said openings measured along said seam.

10. The method called for in claim 1 wherein the central sealed portion of said upper edges has a length at least as great as the length of each of said end openings measured in the direction lengthwise of the seal.

* * * * *