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[54] **PLASTIC BAG**

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[52] **U.S. Cl.** ..... **229/62,** 53/39, 93/35 H, 150/7, 150/12

[51] **Int. Cl.** **B65d 33/06**

[58] **Field of Search** ..... 229/54 R, 68 C, 62; 150/1.7, 12, 7; 93/35 H; 53/14, 39

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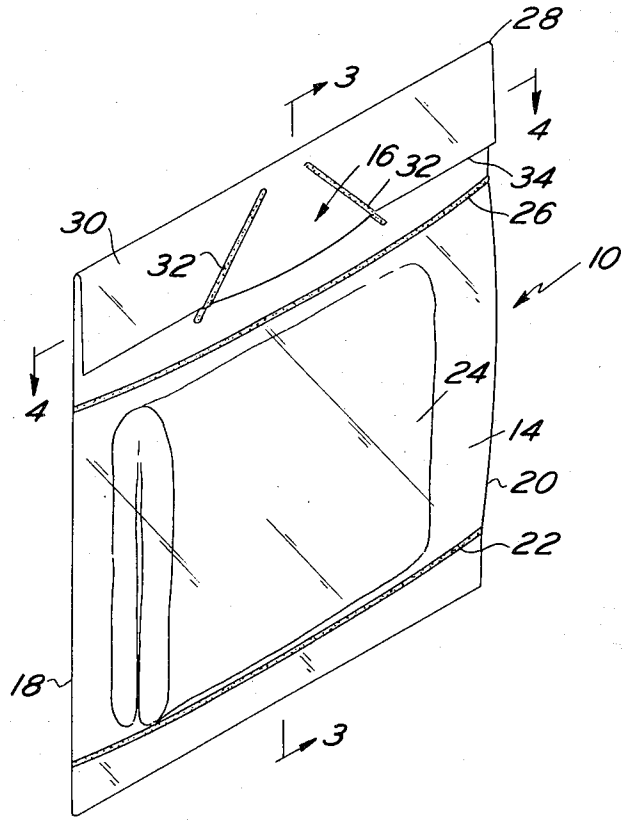
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[57] **ABSTRACT**

A plastic bag comprising a front wall, a rear wall and a sealed bottom. A purchased commodity is placed in the bag and the open top of the bag is folded over, with the folded portion being positioned against the rear wall of the bag. A pair of convergent heat seals secures the folded portion to the remainder of the bag, thereby forming a pocket to receive a hand. The bag is then carried by placing a hand in the pocket.

8 Claims, 4 Drawing Figures



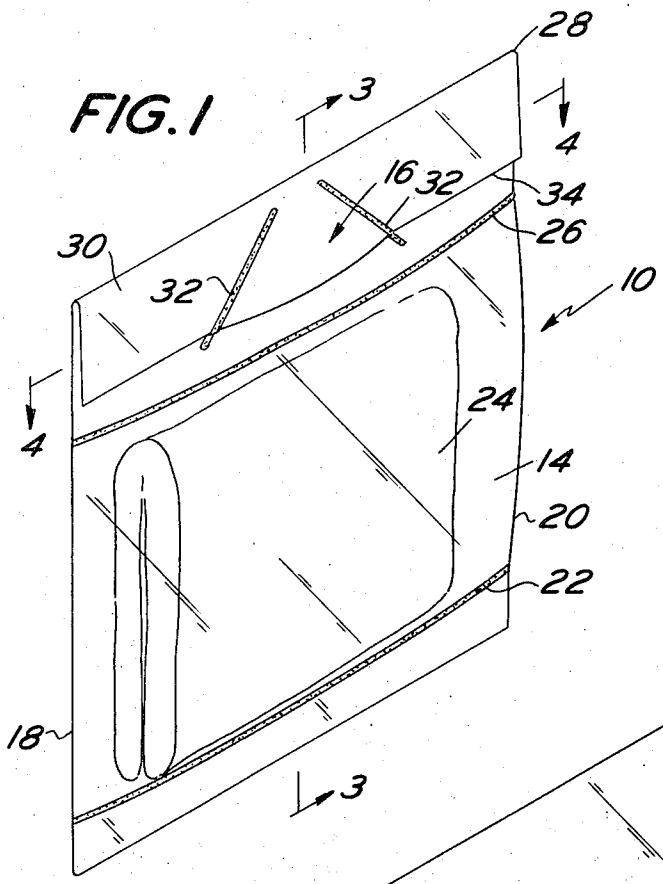


FIG. 1

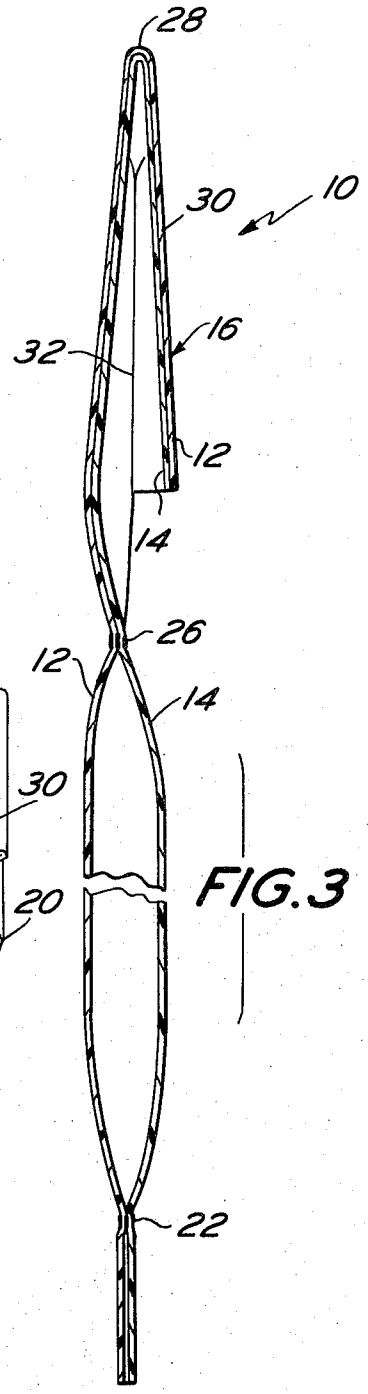


FIG. 3

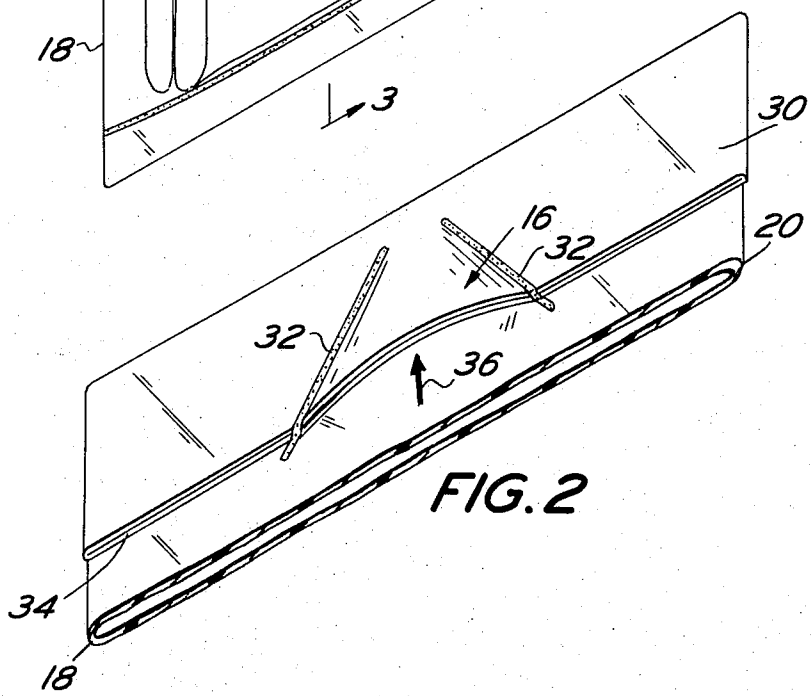


FIG. 2

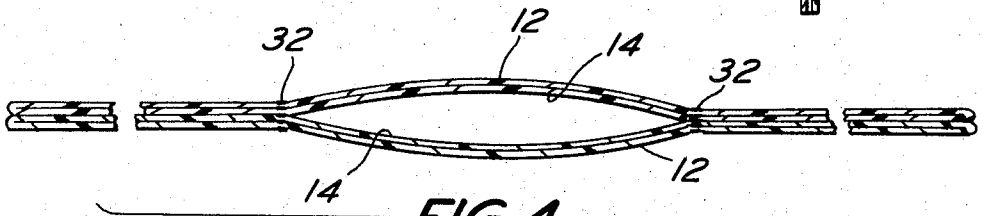


FIG. 4

PLASTIC BAG

This invention relates to a plastic bag, and more particularly, to a plastic bag used for packaging and carrying various items of merchandise, such as clothing.

Many retailers now package vended goods in plastic bags. These bags are attractive in appearance, are waterproof and are generally quite durable. It has been discovered that all of the plastic bags have one problem that is common to them, that is, the provision of a durable, yet inexpensive, carrying handle. Until the advent of the invention covered by this application, the plastic bags have generally been available with one of three types of handles, that is, a die cut handle, a die cut and reinforced handle, or a separate fabricated handle attached to the bag, either mechanically or by heat sealing.

The die cut handle comprises a cut that is formed in the plastic of the bag. This handle is inexpensive, but since the plastic is high in tensile strength and low in shear strength, the die cut reduces the carrying capacity of the bag and makes its use very limited. Thus, if substantial weights are placed in the bag, it has been found that the bag will tear at the portion that has been die cut.

The reinforced die cut handle consists of a folded form that is heat sealed to the rim of the die cut slot in the bag. This handle has adequate shear strength, but the cost of the reinforcement is sometimes as high as the cost of the bag itself.

Likewise, the separate handles do have sufficient strength to withstand substantial weights placed in the bag. The difficulty in attaching these handles, however, increases the price even more than the reinforced die cut handles.

The plastic bag of this invention overcomes all of the problems of the prior art plastic bag, insofar as the handles are concerned. The bag of this invention includes an inexpensive handle which is both strong and easy to manufacture. The bag of this invention has an additional advantage in that the contents of the bag are sealed in place. Therefore, the bag can be used as an effective deterrent to a shoplifter, since the security guard in a store can check to determine whether all bags leaving the store are still sealed at the handle of the bag.

It is accordingly an object of this invention to provide a novel plastic bag.

It is another object of this invention to provide a plastic bag having a novel handle.

It is a further object of this invention to provide a method of forming a handle on a plastic bag.

These and other objects of this invention are accomplished by providing a plastic bag having a front wall, a rear wall and a sealed bottom, a commodity sealed in said bag, and a handle on said bag, said handle comprising a flap formed from said front and rear walls and being folded over against said rear wall, a pair of heat seals securing said flap to said front and rear walls, said heat seals forming a pocket therebetween, and being positioned inwardly from the side edges of said front and rear walls.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is a perspective view of the plastic bag of this invention, with a commodity sealed therein;

FIG. 2 is a partial perspective view of the plastic bag of FIG. 1, and illustrating the method of carrying the bag of FIG. 1;

FIG. 3 is an enlarged sectional view, partially broken away, taken along the line 3—3 of FIG. 1; and

FIG. 4 is an enlarged sectional view, partially broken away, taken along the line 4—4 of FIG. 1.

Referring now in greater detail to the various figures of the drawings wherein like reference characters refer to like parts, a plastic bag embodying the present invention is generally shown at **10** in FIG. 1. As seen in FIG. 3, bag **10** basically comprises a front wall **12**, a rear wall **14** and a pocket **16** that serves as a carrying handle.

Bag **10** can be formed from any of the thermoplastic packaging materials known to the art. By way of specific example, the bag is formed from tubular high density polyethylene. Thus, it includes edges **18** and **20** which join the front and rear walls **12** and **14**, which edges comprise the edges of the tube. The bottom of the bag is formed by a heat seal **22** which extends across the tube. Heat seal **22** can be at or adjacent the bottom edge of the bag.

To the extent described, the bag **10** is the same as substantially all of the plastic bags now in use. Thus, it includes a front wall, a rear wall, side edges and a sealed bottom. The specific improvements of the bag of this invention are placed on the bag after a commodity has been placed in the bag. By way of example, in FIG. 1 there is shown a commodity **24** that has been placed in the bag by a merchant. Commodity **24** can be any vended commodity, such as a skirt, slacks, socks, fabric, etc. After the commodity **24** is placed in the bag, a second laterally extending heat seal **26** is formed on the bag. As seen in FIGS. 1 and 3, heat seal **26** secures the front wall **12** to the rear wall **14**, and extends across the entire width of the bag.

Seal **26** is an optional feature of the bag, and the bag is fully functional without the use of this specific seal. The purpose of the seal **26** is to add additional security against shoplifting. Thus, when a customer buys the commodity **24** and the commodity is subsequently heat sealed in the bag **10** by the seal **26**, it will be impossible for the customer to place additional goods in the bag **10** prior to leaving the store. Most stores now have security guards stationed at the front entrance to the store. Accordingly, all that need be done by the security guard is to make sure that every bag leaving the store has a closed seal **26**. If the seal **26** has been broken, there is the possibility that shoplifting has occurred, and the breaking of the seal will alert the security guard to the possible shoplifting. Additionally, having the sealed bag will be a deterrent to a customer from attempting any shoplifting by placing additional items in the bag **10**.

One of the salient features of the bag of this invention is the provision of a handle. In order to accomplish this, a fold line **28** is made in the bag adjacent the top. This forms a flap **30**. As seen in FIG. 3, flap **30** comprises a portion of rear wall **14** and a portion of front wall **12**, with the portion of the rear wall being contiguous with the balance of the rear wall. Thus, the flap is folded back against the rear wall **14**.

After the flap **30** has been folded in place, a pair of convergent angled heat seals **32** is formed at the top of the bag. Heat seals **32** project at 45° angles, and are an-

gled toward each other, but do not meet. They terminate just below the fold line **28** at their upper edges. The heat seals join the two plys of flap **30** to the front wall **12** and rear wall **14,** as seen in FIG. **4.** They extend downwardly approximately three-eighths inch below the lower edge **34** of flap **30.** Thus, the lower portions of the heat seals join the front and rear walls **12** and **14,** respectively, to each other.

The heat seals **32** in combination with the flap **30** and front and rear walls form the pocket **16.** This pocket serves as a carrying handle for the bag **10.** Thus, when it is desired to carry the bag, the four fingers of one hand are inserted in the pocket **16** in the direction of arrow **36** (FIG. **2**), and the thumb is placed on the exterior of flap **30.**

The middle finger will pass through the gap between heat seals **32** and the other fingers will abut the heat seals. In this way, there is no danger of a fingernail piercing the fold line **28.** Accordingly, all of the weight of the bag will be borne by the heat seals **32.**

It is accordingly seen that the strength of the handle is at least as great as the tensile strength of the material itself. Since there are no holes cut in the plastic to form the handle, there is no problem in connection with the shear strength of the plastic, since there are no shear areas. Additionally, since the heat seals **32** are actually formed from the welding of four separate plys of plastic, as is apparent in FIG. **4,** the heat seals are actually stronger than the bag itself. Since all forces in carrying the bag will be directed perpendicularly against the heat seals by the insertion of the fingers in pocket **16,** the carrying handle will accordingly be the strongest portion of the bag.

Utilizing the teachings of this invention, a handle can be formed on a plastic bag at far less cost than any of the handles of the prior art. Additionally, the handle will be as strong as, if not stronger than, any of the handles of the prior art used on plastic bags. It should also be noted that when a customer has more than one bag to carry, bags can be nested on each other by stacking one handle on another. This is easily accomplished in view of the flexibility of the plastic and the fact that all angled seals **32** will be of the same size. Any suitable heat sealing machinery known to the art can be used for forming the seal **26** and the angled seals **32.**

As seen in FIGS. **1** and **2,** the angled seals **32** project below the lower edge **34** of flap **30.** The purpose of doing this is to have the entire lower edge of the flap welded to the rear wall **14.** If the seals **32** did not extend below the lower edge **34,** there is a possible tear area at the juncture of the bottom of the heat seals **32** and the unsealed lower portion of the flap **30.** In most instances, however, this feature is not critical, and only when substantial weights will be carried by the plastic bag will it be necessary to extend the heat seals **32** below the lower edge of the flap. As a general rule, however, once the heat sealing machinery has been placed in any store, it will normally be set to extend the seals **32** below the lower edge of the flap.

As pointed out above, the use of the heat seal **26** to completely seal the bag is an optional feature which aids in preventing shoplifting. It should be understood, however, that merely folding over flap **30** and applying the heat seals **32** is also an aid to preventing shoplifting. Thus, so long as the flap is folded over and sealed in place, it is most difficult to insert any other items into the bag **10.** However, for maximum security, the heat seal **26** is used.

The angle of the heat seals can vary. However, it has been found that the optimum angle, both from the standpoint of ease in handling and maximum strength, is the 45°, convergent angles shown. This angle can vary, however and in certain instances, where the weights to be carried are not too great, the heat seals **32** can be a pair of spaced, parallel vertically extending lines. The pocket **16** is formed between the spaced parallel heat seals. In this case, the weight of the bag is borne by grasping the flap **30** in the area of pocket **16,** rather than by having the fingers of the hand bear against the heat seals **32.**

This invention embodies not only the complete bag **10,** but also its method of sealing. Thus, the method comprises the insertion of the commodity **24** into the bag, the optional formation of the heat seal **26,** the folding over of the flap **30** and the provision of the pocket **16** by the formation of heat seals **32.** Any thermoplastic packaging material can be used in carrying out the method of this invention and in the bag of this invention. Polyethylene is a preferred material, and more particularly, high density polyethylene. The plastic material can be used in any of the thicknesses normally used in bags for packing merchandise, which normally is in the range of 1 to 5 mils.

In the embodiment of the invention shown, the bag is formed from tubular polyethylene. However, the bag can just as easily be formed from sheet polyethylene which is folded over, thereby making the bottom fold line the bottom of the bag. Side heat seals can then be applied to form the edges **18** and **20.** The bag is sealed at the top in the same manner as shown. When the bag is formed from tubular polyethylene, the bottom of the bag can be formed by the seal **22,** which is positioned either adjacent the bottom edge of the bag or at the bottom edge of the bag. Both methods of heat sealing are well known to the art.

Without further elaboration, the foregoing will so fully illustrate my invention, that others may, by applying current or future knowledge, readily adapt the same for use under various conditions of service.

What is claimed as the invention is:

1. A plastic bag having a front wall, a rear wall, a closed bottom and a handle on said bag, said handle comprising a flap formed from said front and rear walls, and being folded over against said rear wall, a pair of linear heat seals securing said flap to said front and rear walls, said heat seals being positioned inwardly from the side edges of said front and rear walls and being angled towards each other, said heat seals forming a pocket therebetween, said heat seals being spaced a distance whereby a hand may be inserted in said pocket, with at least some of the fingers of said hand contacting said heat seals when said hand is in said pocket.

2. The plastic bag of claim **1** wherein said heat seals project at 45° angles and are convergent, but do not meet.

3. The plastic bag of claim **1** and further including a commodity in said bag, and a heat seal joining said front and rear walls above said commodity, thereby sealing said commodity in said bag.

4. The plastic bag of claim **3** wherein said commodity sealing heat seal extends across the entire width of said bag.

5. A plastic bag having a front wall, a rear wall, a closed bottom and a handle on said bag, said handle comprising a flap formed from said front and rear walls, a pair of heat seals securing said flap to said front and rear walls, said heat seals forming a pocket therebetween, said heat seals extending downwardly beyond the lower edge of said flap and joining said front and rear walls below said lower edge.

6. A method of forming a handle on a plastic bag formed from a thermoplastic material, said bag comprising a front wall, a rear wall and a closed bottom, forming a flap from both said front and rear walls, folding said flap against said rear wall, heat sealing said flap to said front and rear walls by spaced linear heat seals, said heat seals being angled towards each other to provide a pocket therebetween, said pocket serving as a handle for said bag, and said heat seals being sufficiently close to each other to permit at least some of the fingers of a hand inserted in said pocket to contact said heat seals.

7. The method of claim 6 and further including the step of placing a commodity in said bag prior to forming said handle, and forming a laterally extending heat seal above said commodity to seal said commodity in said bag.

8. A method of forming a handle on a plastic bag formed from a thermoplastic material, said bag comprising a front wall, a rear wall and a closed bottom, forming a flap from said front and rear walls, folding said flap against one of said walls, forming a pair of spaced heat seals which join said flap to said front and rear walls, and extending said heat seals downwardly from said flap to join said front and rear walls below said flap.

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