

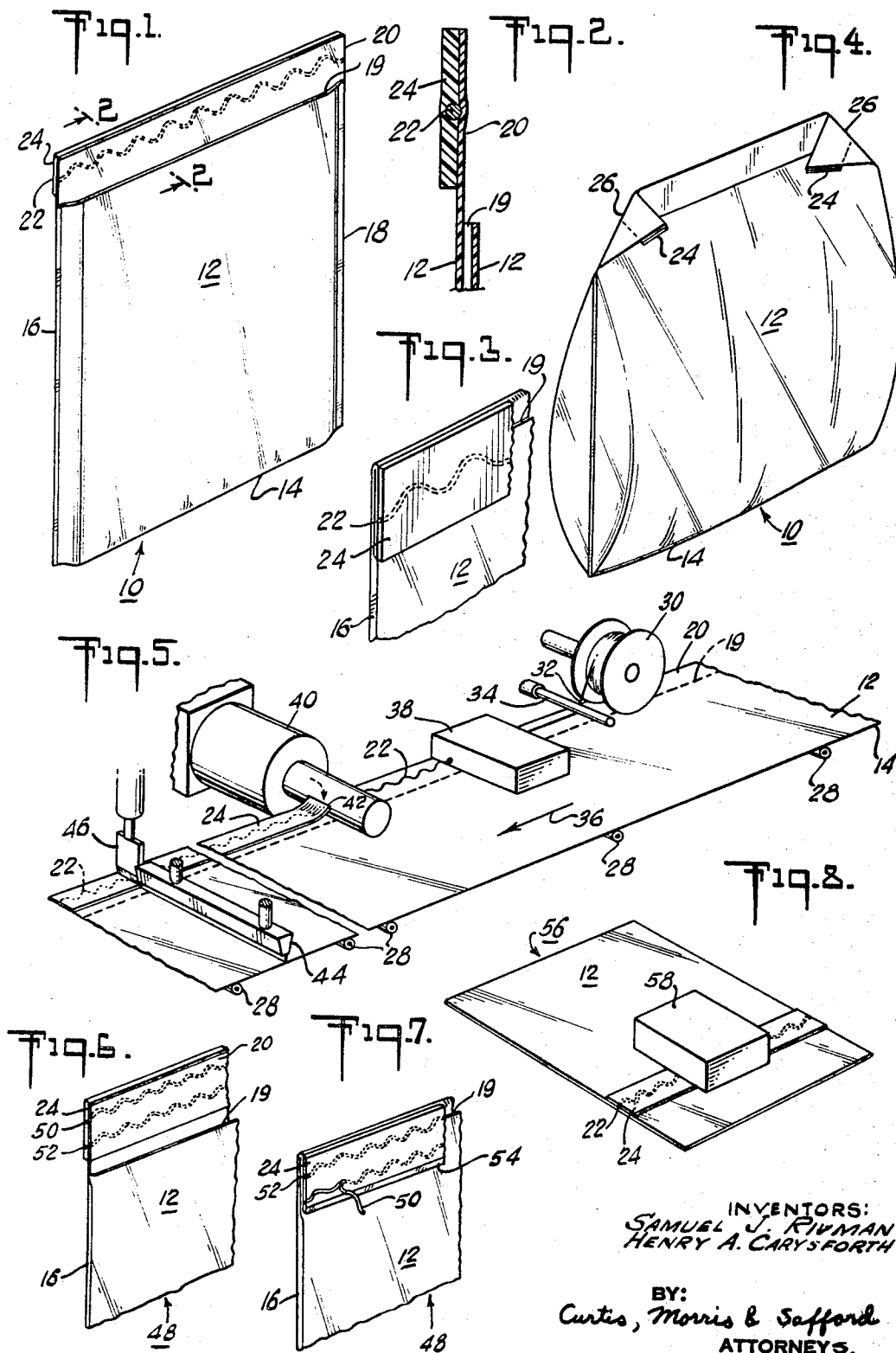
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METHOD OF MAKING A RECLOSABLE BAG

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METHOD OF MAKING A RECLOSABLE BAG

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2 Claims. (Cl. 93—35)

This is a division of Ser. No. 485,262, filed Sept. 7, 1965, now U.S. Patent No. 3,321,126, issued May 23, 1967.

The present invention relates to plastic containers and methods for making such containers; more particularly, this invention relates to closable plastic containers which are easily opened and easily sealed shut again, and to methods for making such containers.

Plastic bags, particularly bags made of polyethylene, have come into great popularity for packaging various materials and articles. For example, clothing or similar articles often are packed in heat-sealed polyethylene bags. Often a prospective purchaser desires to open the bag to inspect its contents. Because the bag is heat-sealed, it must be cut or torn open to permit this inspection. If the customer decides not to buy the article, it will be difficult to sell because its protective bag has been destroyed. This is true even if the torn bag is laboriously sealed shut again by conventional methods.

Often, several perishable articles such as fruits and vegetables are packed in one plastic bag. As pointed out above, once the bag is torn or cut open, it cannot be resealed easily. Therefore, any articles remaining in the bag after it is opened are unprotected from contamination and easily could fall out. If it were possible to easily open the bag without cutting or tearing it, and if it were easily re-sealable, it would be convenient for the user to take a few items out of the bag, and then reseal the bag, thus maintaining the protection of the remaining items.

Accordingly, one object of the present invention is to provide a plastic bag which is easily opened and resealed without the use of adhesive tape, heat-sealing, or other means requiring special equipment.

It is a further object of the present invention to provide a simple, sturdy, long-lasting reclosable plastic bag which is relatively inexpensive to manufacture.

In the past, bags made of paper and similar materials have been provided which have a metallic strip across the top which can be bent over at its ends for resealing the bag after it has been opened. However, considerable problems have been met in securing such metal strips to the bag material. Additionally, often it has been required that the strips have considerable lateral extent so as to be easily handled by the user. This increases the amount of metal required for the strips and makes them unduly expensive.

Accordingly, another object of the present invention is to provide a relatively inexpensive, reliable and trouble-free method of securing a metal closure member to a plastic container, and to provide a metal resealing member of substantial lateral extent with a minimum amount of metal.

A further object of the present invention is to provide a unique container structure which is foldable to cover and protect objects to be contained in the structure.

The drawings and description that follow describe the invention and indicate some of the ways in which it can be used. In addition, some of the advantages provided by the invention will be pointed out.

In the drawings:

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FIGURE 1 is a perspective, partially broken-away view of a plastic bag of the present invention;

FIGURE 2 is an enlarged cross-sectional, partially broken-away view taken along line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged perspective view of the bag shown in FIGURE 1 with the bag flap folded over during an intermediate step in the process of closing the bag;

FIGURE 4 is a perspective view of the bag of FIGURE 1 filled with objects to be stored in it and sealed in accordance with the present invention;

FIGURE 5 is a perspective and partially schematic view of apparatus used in the process of manufacturing containers in accordance with the present invention;

FIGURE 6 is a perspective, partially broken-away view of another embodiment of the container of the present invention;

FIGURE 7 is a view similar to FIGURE 6 of the container shown in FIGURE 6 with the bag as originally sealed but partially opened; and

FIGURE 8 is a perspective view of another embodiment of the container structure of the present invention.

A polyethylene plastic bag 10 is shown in FIGURE 1 of the drawings. The bag 10 is formed from a sheet 12 of thin polyethylene film which is folded upon itself along a bottom fold line 14. The folded-together sides of the sheet 12 are heat-sealed together at edges 16 and 18. One edge 19 of the sheet 12 forms one edge of the opening of the bag, and a portion 20 of the opposed side-wall of the bag 10 extends above the edge 19 to form a flap.

In accordance with the present invention, a relatively thin corrugated wire 22 is secured to the rear surface of flap 20 by means of a strip 24 of plastic material such as polyethylene. Wire 22 extends across flap 20 and serves as a closure member. The corrugated wire 22 is made of relatively malleable and inexpensive metal.

The process of closing the bag 10 is quite simple. The bag is filled with the contents to be stored, the flap 20 is folded forwardly over the edge 19 to the position shown in FIGURE 3, is folded once more in the same direction, and then the ends of the corrugated wire 22 are folded over in the manner shown in FIGURE 4 so as to secure the bag shut.

Opening and reclosing the bag similarly is simple. First, the ends of the wire closure element 22 are unbent, the flap 20 is unfolded and the contents are removed. The bag is reclosed in substantially the same way as it originally was closed.

There are many advantages in the use of the corrugated wire 22 as the bag closure member. The corrugations and the relatively wide encapsulating plastic strip 24 supporting wire 24 make the wire 22 easy to grasp and bend, in much the same manner as a wide, solid metal strip, but without the relatively large amount of expensive metal which is used in the metal strip. Furthermore, since the wire is tightly encapsulated and protected by the plastic securing it to the flap 20, it need not be made of expensive corrosion-resistant metal. Additionally, the use of wire as a closure member is uniquely adapted to automatic mass-production methods such as those described below.

The plastic bag shown in FIGURE 1 is manufactured by the novel mass-production method illustrated in FIGURE 5. A sheet 12 of polyethylene film is supplied from a roll. First the film is folded along line 14 and then is fed over a series of drive and idler rollers 28 with the rear surface of flap 20 facing upwardly.

The folded sheet 12 first passes beneath a spool 30 on which a roll of wire 32 is stored. The spool 30 is rotatably mounted on a support shaft 34. The wire 32 is unwound from the spool 30 and is fed through a corrugating device 38 which comprises a pair of loosely meshed spur

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gears between which the wire passes so that the wire takes the shape of the gear teeth. The corrugated wire 22 emerging from the corrugating device 38 is laid upon the back surface of flap portion 20 of the sheet 12.

The sheet 12 then passes beneath an extruding machine 40 which extrudes a thin strip 24 of heated thermoplastic material such as polyethylene onto the back surface of flap 20 over the corrugated wire 22, thus heat-sealing the strip 24 to the flap 20 and simultaneously encapsulating the corrugated wire 22 and fastening it securely to the flap 20.

A heated knife 44 and a cold knife 46 are periodically brought down together to form the plastic sheet 12 into bags. The heated knife 44 simultaneously cuts the sheet into bag-widths and seals the edges 16 and 18 together. The knife 46, which is air-pressure-actuated, cuts the material of the flap along the same line as the cut made by the hot knife 44, and simultaneously cuts the wire 22.

The above method of attaching the wire closure member to the sheet 12 has many advantages. It is relatively simple, inexpensive and is ideally adapted to be performed by automated equipment. Furthermore, with the use of corrugated wire 22 instead of solid metal strip for the closure member, the length of the closure member contracts with the length of the plastic strip 24 as both strip 24 and wire 22 are cooling, thus preventing the ends of the wire from extruding out from the sides of the bags and possibly injuring the users of the bag or snagging on the users' clothing. This extreme contraction is made possible by the corrugated shape of the wire and is not obtained from solid metal strips.

Referring now to FIGURES 6 and 7, the bag 48 shown in these figures is substantially the same as bag 10 shown in FIGURES 1 through 4 except that two corrugated wires 50 and 52 are secured to the flap 20 by means of the strip 24. Also, during the bag manufacturing process, the flap 20 is folded down over the edge 19 and the flap 20 is heat-sealed to the front wall 12 of the bag 48 along line 54. Typically, the bottom of this bag is left open and the bag is filled through the open bottom during this manufacturing process. Then the bottom is sealed and the filled bag is shipped to the customer.

In accordance with a further aspect of the present invention, when the customer wishes to open the bag 48, he may grasp the lowermost corrugated wire 50 and pull outwardly as is illustrated in FIGURE 7, thus tearing through the strip 24 and allowing the customer to open the bag along the line where wire 50 has been pulled loose. Then, when the customer wishes to reclose the bag, the second corrugated wire 52 may be used to reclose the bag 10 shown in FIGURES 1 through 4. Thus, the novel corrugated wire member of the present invention is used for a double purpose; both to make an easily-opened bag, and to make the bag easily reclosable after it has been opened.

Referring now to FIGURE 8, there is shown another container structure 56 which is an embodiment of the pres-

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ent invention. Structure 56 may be used, for example, to wrap objects 58 such as boxes of vegetables or the like before freezing them. Thus, the present invention is used to form a convenient plastic wrapper which can be applied without special heat-sealing tools or the like. The corrugated wire 22 and the strip 24 are applied in the manner described above in connection with FIGURE 5. If it is desired to wrap rectangular objects, the strip is conveniently placed nearer one edge of the plastic sheet 12 than the other edge so that the other edge may be folded over on the top of the object 58 and the wrapper will properly cover the object. Then, the ends of wire 22 and strip 24 are folded up and over the top of the object 58 to hold the plastic wrapper 56 in place. No adhesive tape or special sealing compounds are required to seal the package shut.

While only two wall bags have been shown in the illustrated embodiments, it is to be understood that side-walls may be added to the bag structures without departing from the teachings of the present invention. In addition, it should be understood that various different flexible plastic materials can be used in containers made in accordance with the present invention, including cellophane, paper and other traditional plastic materials, as well as polyethylene and other modern materials. Further, wire closure elements other than corrugated wire can be used. For example, plastic-coated "wire-ties," such as are used for fastening vegetable stems together, etc., may be used either by encapsulation and heat sealing as described above, or by heat sealing alone by conventional heat-sealing procedures. Various other changes or modifications in the embodiments described may occur to those skilled in the art and these can be made without departing from the spirit or scope of the invention as set forth in the claims.

We claim:

1. A method for making reclosable thermoplastic bags, said method comprising the steps of folding thermoplastic sheet material to form opposed side-walls of said bags and leaving an exposed edge of said sheet to form a flap, continuously feeding said sheet past a first station, continuously laying down a wire on said flap at said first station, continuously feeding said sheet and said wire past a second station, extruding and laying over said wire and onto said flap a relatively wide sheet of heated thermoplastic material, cutting said sheet to form said bags, and heat-sealing the edges of said bags.

2. A method as in claim 1 including the step of corrugating said wire before laying it down upon said flap.

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