

[54] **PLASTIC LOOP TIE CLOSURE FOR BAGS**

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[73] Assignee: **Mobil Oil Corporation**

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[21] Appl. No.: **40,031**

[52] U.S. Cl.....**24/30.5 P**

[51] Int. Cl.....**B65d 77/10**

[58] Field of Search.....24/208 A, 206 A, 30.5 PB, 150 FP,  
24/30.5 TC, 16 PB, 17 A, 20 R; 40/21 A; 229/62

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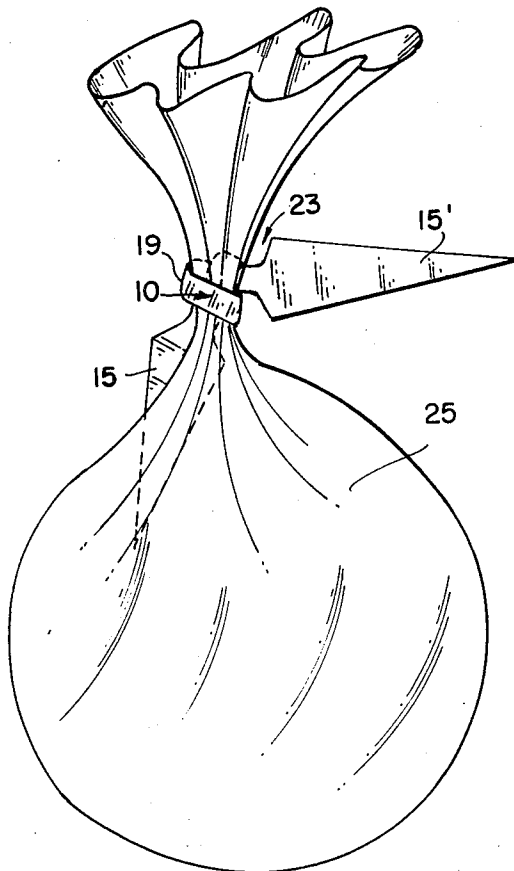
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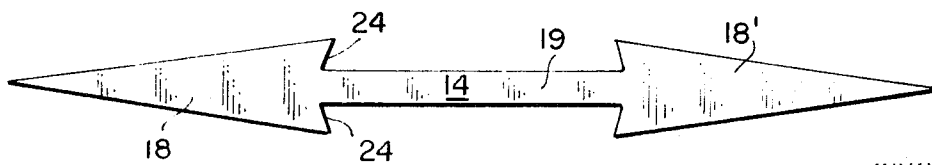
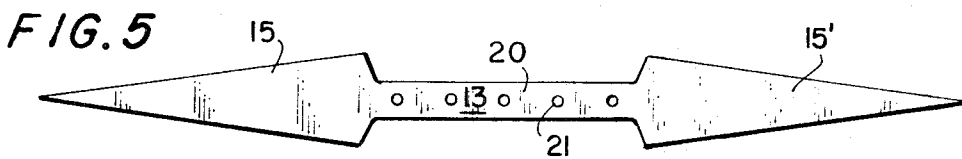
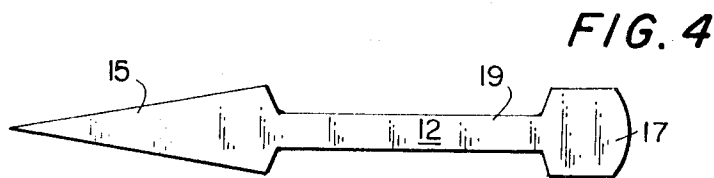
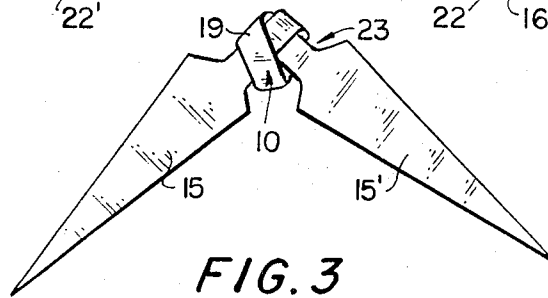
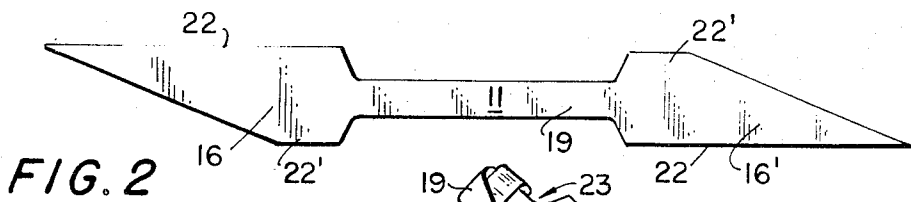
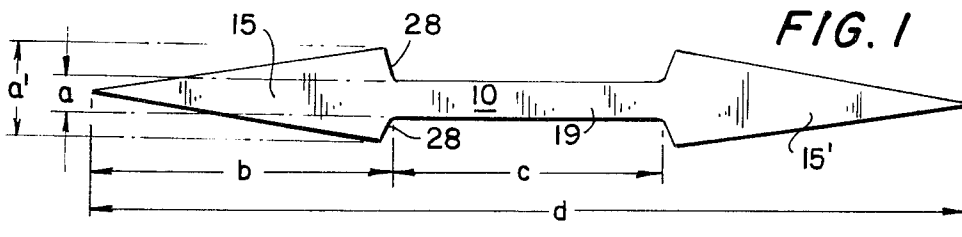
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[57] **ABSTRACT**

A plastic tie device for easily, quickly, and securely loop closing the gathered folds of a flexible bag opening is provided. The tie device comprises a flexible elongated strap having a center portion narrower than the end portions such that an interlacing of the strap around said gathered folds of said flexible bag opening forms a secure knot.

**2 Claims, 8 Drawing Figures**





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FIG. 6

FIG. 7

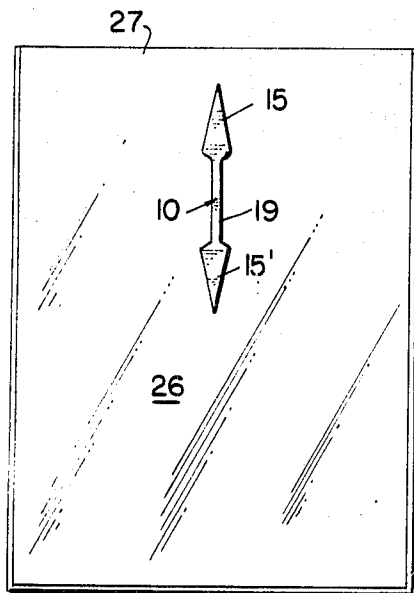
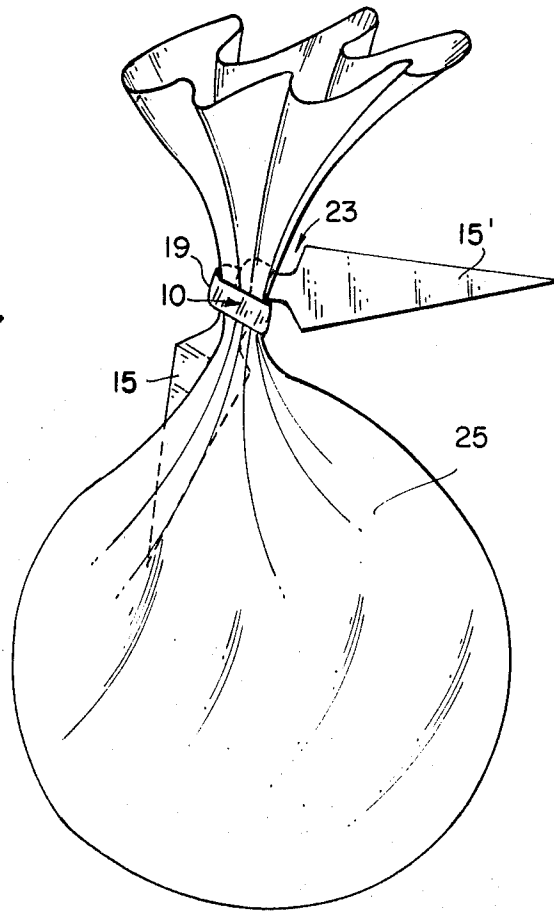


FIG. 8

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## PLASTIC LOOP TIE CLOSURE FOR BAGS

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

A closure device of the present invention has application as a means for closing flexible bags.

## 2. Description of the Prior Art

U. S. Pat. No. 3,114,184 discloses a device for use as a bag closure which comprises a male to female interlocking means having exterior edges of lateral teeth on the male member, and U. S. Pat. No. 3,363,293 discloses a bag tie with a locking means similar to that of the above patent. No prior art is known of the type provided by the present invention for the described closure of flexible bag structures.

## SUMMARY OF THE INVENTION

This invention provides a closure device, for a flexible bag structure, comprising a flexible elongated strap, preferably substantially flat, having a center portion narrower than the end portions such that an interlacing of the strap forms a secure knot. The knot so formed may be tightened around the gathered folds of a flexible bag structure opening to effect closure of the bag structure.

The closure device of the present invention may as an embodiment comprise a 10-15 mils thick polyethylene strap 12 inches long and having arrow-type end configurations pointing away from the narrower center portion.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a flat top view of a flexible tie device embodied by the present invention.

FIG. 2 is a flat top view of another embodiment of a flexible tie device according to the present invention.

FIG. 3 is a perspective view of the tie device of FIG. 1 in a tightened interlaced knot.

FIG. 4 is a flat top view of another embodiment of a tie device according to the present invention.

FIG. 5 is a flat top view of another embodiment of the present invention.

FIG. 6 is a flat top view of another embodiment of the present invention.

FIG. 7 is a perspective view of a bag closed by a closure of the present invention.

FIG. 8 is a plan view of a plastic bag in combination with a closure device, as embodied herein, detachably secured to the bag.

## DESCRIPTION OF SPECIFIC EMBODIMENTS

Referring now more particularly to the drawings in which like reference characters indicate like elements throughout, in FIG. 1 there is shown tie device 10, made of a plastic material such as polyethylene. Tie device 10 comprises a center portion 19 narrower than the end portions 15 and 15'. In this particular embodiment, end portions 15 and 15' are substantially elongatedly tapered to a point such that they form arrow-type configurations pointing away from the narrower center portion 19. The wide-end shoulders of the arrow-type ends 15 and 15' taper to meet the narrower center portion 19 by segments 28 which slope toward the center of center portion 19.

In FIG. 2, another tie device embodied by the present invention is shown. In this embodiment, tie device 11 comprises a center portion 19 narrower than the end portions 16 and 16'. End portions 16 and 16' are again substantially elongatedly tapered to a point such that they form arrow-type configurations pointing away from the narrower center portion 19. However, the arrow-type ends are skewed in such a way that one edge 22 of each arrow is parallel to the edges of center portion 19. Also, the other edges 22' are parallel to edges 22 for a small distance from the shoulders of each arrow toward the points. As shown in this device 11, the edges 22 and 22' are diagonally opposite each other when the device is layed flat.

FIG. 3 shows a perspective view of the tie device 10 of FIG. 1 in a tightened interlaced knot 23. The tightened knot resides entirely within the center portion 19 of the device which is narrower than end portions 15 and 15'. An interlacing of this device 10 around the gathered folds of a flexible bag opening forms a secure closure via the interlaced knot 23 when knot 23 is tightened. The wide end portions serve as stops to prevent the closure from coming open.

FIG. 4 shows another embodiment of a tie device of the present invention. This device 12 comprises center portion 19 narrower than the end portions 15 and 17. End portion 15 is substantially elongatedly tapered to a point such that it forms an arrow-type configuration pointing away from the narrower center portion 19. End portion 17 does not form an arrow-type configuration, but is at least as wide as the shoulder portion of the end portion 15 and acts as a tab for holding when pulling the interlaced knot tightly around the gathered folds of a flexible bag opening.

FIGS. 5 and 6 are other embodiments of the present invention. The device 13 of FIG. 5 comprises end portions 15 and 15' as does device 10 of FIG. 1 and center portion 20 which is narrower than the end portions. Center portion 20 comprises perforations 21 which increase the security of the tightened interlaced knot by allowing the center portion to collapse more in the tightened knot position. FIG. 6 shows device 14 which comprises center portion 19 narrower than end portions 18 and 18'. The wide-end shoulders of the arrow-type ends 18 and 18' taper to meet the narrower center portion 19 by segments 24 which slope away from the center of center portion 19.

FIG. 7 shows a closure device, as illustrated in FIG. 3, in combination with a flexible bag 25 to effect closure of the bag opening by securely holding the gathered folds of said bag opening closed. In this embodiment, and with bag 25 filled or otherwise containing material that may be trash, food products, etc., the closure is effected in the manner aforesaid in regard to FIG. 3.

The closure device of the present invention may be used with flexible bag structures of various types. Non-limiting examples of flexible bag structures with which the present closure device is useful include paper, cellophane, vinyl, polyethylene and the like. The closure device may be attached, in detachable manner, to individual bag structures for use when closure of the bag is desired. Non-limiting means of attaching them to bags include adhesive tape, glue, rubber adhesives, adhesives based on acrylate resins, and pressure sensitive adhesives such as those based on polyvinyl ether. An embodiment of the latter is shown in FIG. 8 wherein a closure device 10 as embodied herein is attached by means of, for example, a pressure sensitive polyvinyl ether adhesive to an outside wall of plastic bag 26 having an open mouth at 27. When the bag 26 is used for packaging and is to be closed, strap 10 can be readily detached and used for closure as aforesaid.

The closure device may be made from any resilient material, examples of which include thermoplastics, suitably flexible paper products, etc., in single film thickness or a plurality of films (laminates) sealed together to give a desired thickness and rigidity for the intended usage.

The closure device, as embodied herein, is desirably provided with a smooth surface material. However, for some applications, an embossed pattern in the body of the strap material is suitable.

The size specifications of the closure device of the present invention may vary according to its prospective use. For many usages, a device as embodied herein is suitable when comprised of a suitable plastic material from about 10 to about 15 mils in thickness, and, in reference to FIG. 1, having other dimensions according to the following Table:

## TABLE OF DIMENSIONS

Dimension Location from FIG. 1	Dimension Increment, Inches	Dimension, Inches
a	¼-¾	7/16
a'	½-1	¾
b	3-5	4
c	2½-4	3½
d	10-14	12

A specific example of a closure device of the present invention, generally suitable for closure of plastic garbage bags and food bags comprises a 10 mils thick smooth polyethylene film of the configuration shown in FIG. 1 having the dimensions:

- a = 7/16 inch,
- a' = ¾ inch,
- b = 4 inches,
- c = 3 ½ inches, and
- d = 12 inches.

Another specific example of a closure device of the present invention, also generally suitable for closure of plastic garbage bags and food bags comprises a 15 mils thick smooth polyethylene film of the configuration shown in FIG. 2 having the same dimensions as the specific example above and also with parallel edges 22' being ½ inch long.

The success of a tie device of this kind depends upon the

stops or catches provided by the wider end portions preventing the knot from becoming untied. These stops or catches can be supplemented in several ways. Non-limiting examples of doing this include cutting small slits perpendicular to the length of the tie device throughout the center area, or cutting small triangles out of the device in the same area.

Although the present invention has been described with preferred embodiments, it is to be understood that modifications and variations may be resorted to, without departing from the spirit and scope of the invention, as those skilled in the art will readily understand.

What is claimed is:

1. A flexible bag having an open mouth in gathered form closed by a flexible strap having a center portion narrower than the end portions of said strap, said end portions being substantially elongatedly tapered to a point such that they form arrow-type configurations pointing away from said narrower center portion, said strap having its center portion surrounding the gathered mouth of said bag and knotted to securely close said bag whereby the shoulders of said arrow-type end portions serve as stops to prevent undesired opening of the knot.

2. A flexible bag having an open mouth in gathered form closed by a strap as defined in Claim 1, wherein said strap comprises a thermoplastic material.

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