United States Patent [19]

Clayton

[11] **3,874,034**

[45] **Apr. 1, 1975**

[54] **PERFORATED THERMOPLASTIC PLASTIC STRAP CLOSURE AFFIXED TO AN OPEN MOUTH BAG STRUCTURE**

[75] Inventor: **William J. Clayton,** Fairport, N.Y.

[73] Assignee: **Mobil Oil Corporation,** New York, N.Y.

[22] Filed: **Feb. 7, 1974**

[21] Appl. No.: **440,421**

Related U.S. Application Data

[63] Continuation of Ser. No. 216,411, Jan. 10, 1972, abandoned, Continuation-in-part of Ser. No. 35,779, May 8, 1970, Pat. No. 3,633,247.

[52] **U.S. Cl.** ..... **24/30.5 P,** 229/62

[51] **Int. Cl.** **B32b 3/02,** B65d 63/00

[58] **Field of Search** ..... 229/62; 206/DIG. 18; 24/30.5 P, 16 PB

[56] **References Cited**

UNITED STATES PATENTS

2,996,177	8/1961	Sproull et al.	206/DIG. 18
3,224,054	12/1965	Lige	24/16 PB
3,412,926	11/1968	Bostwick	229/62
3,417,863	12/1968	Paxton	229/62
3,438,095	4/1969	Evans	24/16 PB
3,565,738	2/1971	Kirkpatrick	229/62

FOREIGN PATENTS OR APPLICATIONS

796,222	1/1936	France	24/16 PB
1,278,571	10/1961	France	24/16 PB
1,468,567	12/1966	France	24/30.5 P
259,578	6/1949	Switzerland	24/16 PB

Primary Examiner—Donald A. Griffin

Attorney, Agent, or Firm—Charles A. Huggett; James D. Tierney

[57] **ABSTRACT**

A device for easily, quickly, and securely closing flexible bag structures comprising an elongated strap made of resilient material having at least two longitudinally spaced apart perforations. The strap has an end portion of configuration adapted for insertion into and pulling through a perforation in said strap spaced apart from another perforation intermediate said end portion and the perforation through which the end portion is inserted to form a noose. In use, such as for closing the gathered mouth of a bag, a positive lock is provided upon further pulling of said end portion until the intermediate perforation interlocks with the perforation through which the end portion is inserted. Additionally, an improved closure device in combination with a bag structure is provided comprising a plastic strap having a single aperture at one end adapted to receive the opposite end of the strap when the strap is used for securing an open mouth bag in a closed position. Such a strap is advantageously detachably secured near the open mouth portion of the bag to assure user convenience for ready accessibility of the strap locking device when it is desired to secure the bag in a closed position.

1 Claim, 13 Drawing Figures

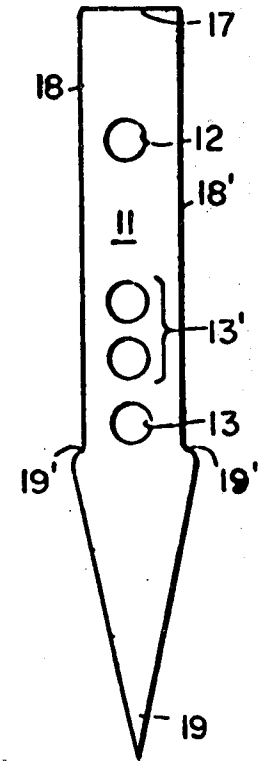


FIG. 1

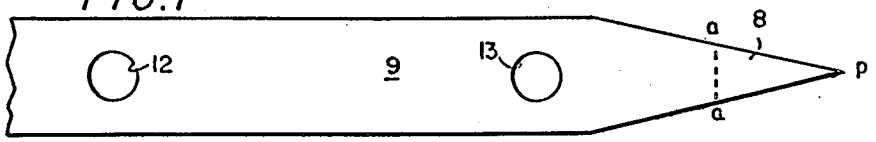


FIG. 2

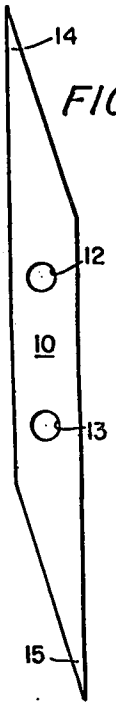
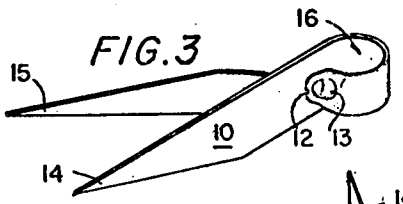


FIG. 3



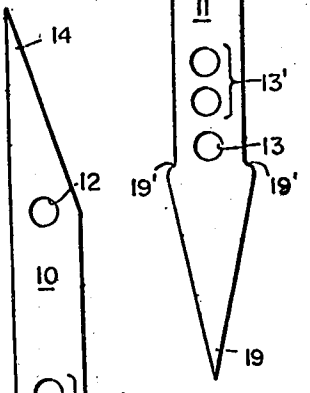


FIG. 4

FIG. 5

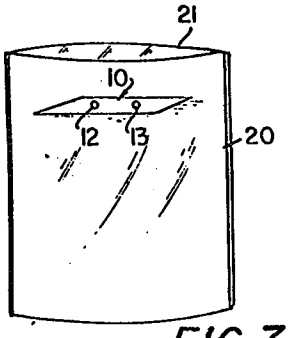


FIG. 7

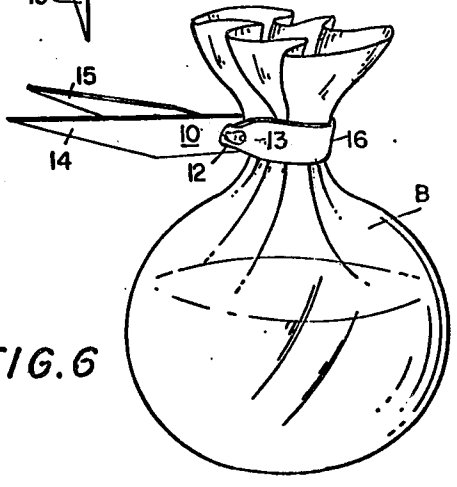


FIG. 6

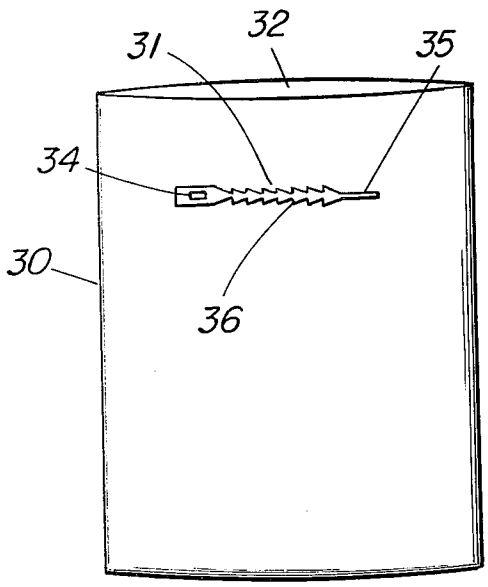


FIG. 8

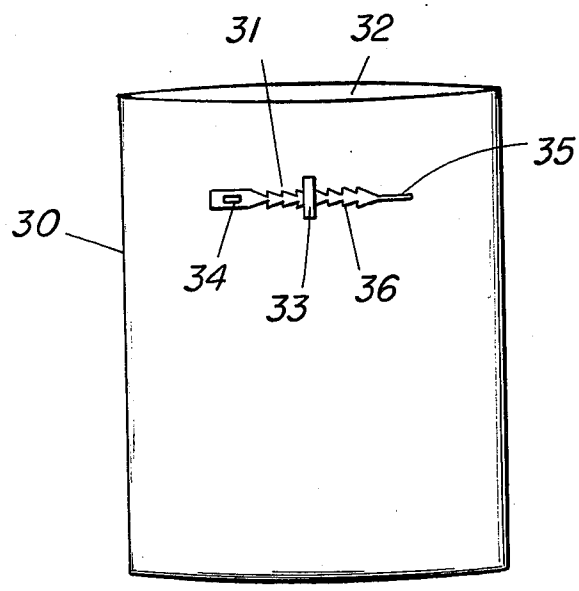


FIG. 9a

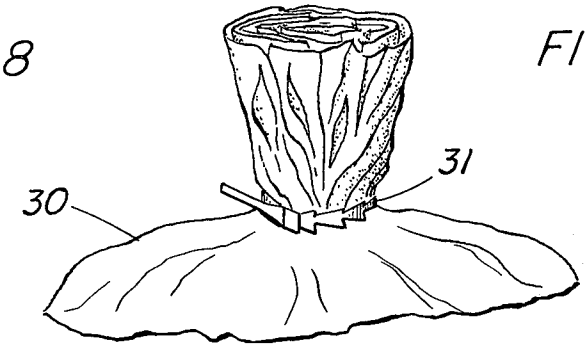


FIG. 9b



FIG. 10

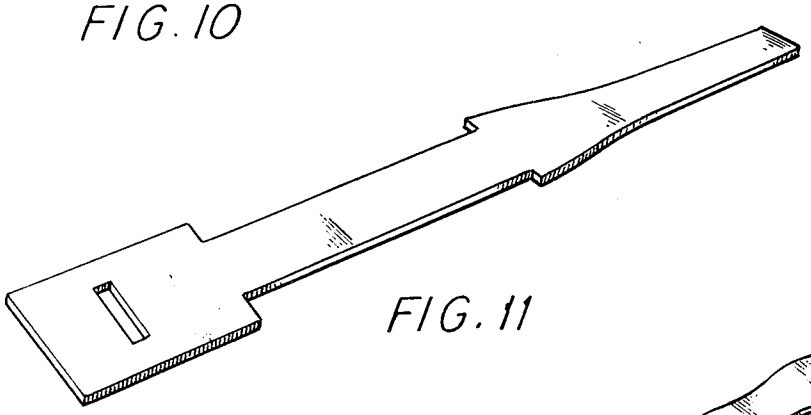


FIG. 11

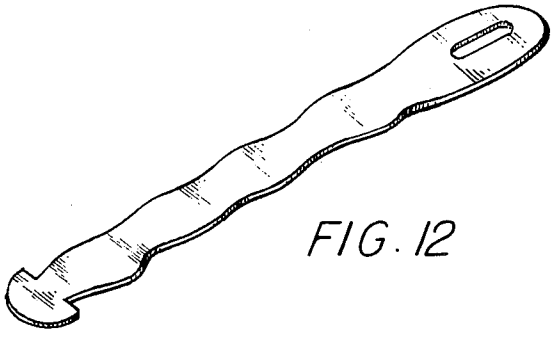


FIG. 12

PERFORATED THERMOPLASTIC PLASTIC STRAP CLOSURE AFFIXED TO AN OPEN MOUTH BAG STRUCTURE

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application is a continuation of application Ser. No. 216,411 filed Jan. 10, 1972, now abandoned, which latter application was a Continuation-In-Part application of U.S. application Ser. No. 35,779 filed May 8, 1970, entitled "Perforated Strap Closure For Bags," now U.S. Pat. No. 3,633,247.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The closure device of the present invention has application as a means for closing flexible bags. The closure device is further characterized as being detachably secured adjacent the open mouth portion of the bag it is desired to close.

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. German Pat. No. 1,079,537 discloses locking devices for use as bag closures comprising a flexible strap characterized by having an aperture at one extremity, adapted to receive the opposite extremity of the strap whereby the opposite extremity is passed through the aperture, the aperture edges lockingly engaging protrusions on opposite edges of the closure strap. It will be noted that there is no disclosure in this patent that such locking devices may be or are intended to be detachably attached near or adjacent to the open mouth portion of the bag it is desired to close.

SUMMARY OF THE INVENTION

This invention provides a closure device, for a flexible bag structure, comprising a flexible elongated strap, preferably substantially flat, having at least two longitudinally spaced apart perforations (e.g., circular holes). An end portion of said strap has a configuration adapted (e.g., elongatedly tapered to a point) for insertion into and pulling through one of the perforations spaced apart from another perforation intermediate said end portion and the perforation through which said end portion is inserted to form a noose. Upon further pulling of said end portion until the intermediate perforation interlocks with the perforation through which said end portion is inserted, a positive lock is provided. The noose 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 several of such intermediate perforations (e.g., circular holes) located substantially on the longitudinal axis of a resiliently flexible elongated strap to provide several points of positive locking action by interlocking with the perforation through which said adapted end portion is inserted as the noose is progressively tightened.

Another embodiment of the closure device of the present invention comprises such a strap having two

end portions of a configuration adapted for insertion into and pulling through a perforation spaced apart from a perforation intermediate one of the end portions and a perforation through which said end portion is inserted.

Still another embodiment of the present invention comprises, in combination, an open mouth bag structure having detachably affixed to the exterior surface of one of the bag walls, near or adjacent the open mouth portion of the bag, a closure device comprising a plastic strap having (a) an aperture at one extremity thereof; and (b) a plurality of spaced apart protrusions positioned along one or both longitudinal edges of the strap, the end of the strap opposite said perforation being adapted to be passed through the perforation and further pulled therethrough, when it is desired to remove the strap from the bag and secure the bag in a closed position by forming such a noose. Positive locking action is achieved utilizing such a strap when the protrusions along the longitudinal edges of the strap interlock with the edges of the perforation as the end portion of the strap is inserted and the noose is progressively tightened until the noose snugly engages the gathered mouth of the bag.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a flat top view of a flexible elongated strap embodied by the present invention;

FIG. **2** is a flat top view of another embodiment of a resiliently flexible strap;

FIG. **3** is a perspective view of the strap of FIG. **2** in a tightened noose position;

FIGS. **4** and **5** are flat top views of still other embodiments of flexible straps as embodied herein;

FIG. **6** is a perspective view of a bag closed by a closure of the present invention;

FIG. **7** is a plan view of a plastic bag in combination with a closure device, as embodied herein, detachably secured to the bag;

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

FIG. **9A** is a plan view of a plastic bag in combination with a closure device as illustrated in FIG. **7** detachably secured to the bag utilizing pressure sensitive adhesive tape;

FIG. **9B** is a perspective view of a bag closure utilizing the closure device illustrated in FIGS. **8** and **9**; and

FIGS. **10, 11** and **12** are top planar views of other embodiments of resilient, flexible straps which may be detachably secured to the bag combination of the present invention.

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 flexible elongated strap **9**, made of a plastic material such as polyethylene. Strap **9** comprises an end portion **8** of configuration adapted (i.e., elongatedly tapered to a point P) for insertion into and pulling through a perforation as described hereafter, and two longitudinally spaced apart perforations (i.e., circular holes), of which one perforation **12** is spaced apart from the other perforation **13** intermediate said end portion **8**. When used for a bag closure, the strap of FIG. **1** is adapted for insertion of end portion **8** into perforation **12** and further pulled

therethrough until perforation **13** interlocks with perforation **12,** thus, the strap provides a noose tightenable around the gathered folds of a flexible bag structure opening to effect closure of the bag structure.

In the embodiment of FIG. **1,** end portion **8** of strap **9** is of smaller size in width from line aa to end point P of end portion **8** than is the diameter of perforation **12** which is spaced longitudinally apart from intermediate perforation **13.** The intermediate perforation **13** is disposed in the end portion **8** of strap **9** where the width of the end portion **8** is greater than the diameter of perforation **12.** That is, and as shown, intermediate perforation **13** is disposed in the strap **9** at a portion thereof which is wider than end portion **8.**

In FIG. **2** there is shown another embodiment of a flexible strap **10** provided as a closure device for a flexible bag structure and, in FIG. **3,** such a strap is shown in the form of a closed interlocked loop. The strap **10** comprises end portions **14** and **15** of a configuration adapted (i.e., elongatedly tapered to a point) to be inserted into and pulled through a perforation longitudinally spaced apart from a perforation intermediate the spaced apart perforation and the inserted end portion to form a noose. In this embodiment, perforations **12** and **13** are disposed so that either one can be used as the perforation into which an end portion of the strap can be initially inserted. Thus, if end portion **15** is used as the inserted end portion, perforation **12** is the spaced apart perforation into which end portion **15** is inserted and perforation **13** is the intermediate perforation which provides the positive locking action when it engages with perforation **12** as the end portion **15** is pulled through perforation **12.** Likewise, when end portion **14** is used as the inserted end portion, perforation **13** is the spaced-apart perforation and perforation **12** is the intermediate perforation.

FIG. **3** shows the first of the above options in which end portion **15** is used as the inserted end portion and the noose **16** is formed which may be tightened around the gathered folds of a flexible bag structure opening to effect closure of the bag structure. Also shown in FIG. **3** is the positive locking action provided by interlocking of perforation **12,** with perforation **13,** when the noose is tightened to where perforations **12** and **13** coincide. This positive locking action is accomplished when the flexible strap is compressed into a curl (e.g., generally U-shaped) upon being pulled through a perforation which is smaller in width (e.g., diameter) than is the width of the strap where the intermediate perforation is located. The resilient force due to the compressing of the strap against the inner edge of the outer encompassing perforation is less where the holes interlock than it is on either side of the inside encompassed hole along the strap. This compressive force differential causes the interlocking of the holes to be substantially positive, effectively restraining movement in either a noose tightening or loosening direction.

As a further embodiment, as shown in FIG. **4,** strap **10** comprises a plurality of intermediate or spaced apart perforations **13** on the longitudinal axis between perforations **12** and **13** to provide said positive locking action at various points as the noose is tightened. FIG. **5** shows still another embodiment of the closure device of the present invention in which flexible strap **11** comprises perforation **12** in body portion **17** cut at right angles to the parallel side edges **18** and **18** of the strap and in which the diameter of hole **12** is smaller than the width of at least a portion of tapered end portion **19** of the strap **11.** End portion **19** of strap **11** is tapered to a point so that it can be inserted into and pulled through perforation **12.** Intermediate perforations **13,** 13', etc., provide a positive locking action by interlocking with perforation **12** as the noose is tightened. In the embodiment shown in FIG. **5,** the end portion **19** may be in the configuration shown wherein the tapered end has shoulders (i.e., shoulders **19'**) that provide a positive catch in hole **13.**

FIG. **6** shows a closure device, as illustrated in FIG. **3,** in combination with a flexible bag B to effect closure of the bag opening by securely holding the gathered folds of said bag opening closed. In this embodiment, and with bag B filled or otherwise containing material that may be trash, food products, etc., the closure is effected in the manner aforediscussed 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, and pressure sensitive adhesives. An embodiment of the latter is shown in FIG. **7** wherein a closure device **10** as embodied herein is attached by means of, for example, a pressure sensitive adhesive to an outside wall of plastic bag **20** having an open mouth at **21.** When the bag **20** is used for packaging and is to be closed, strap **10** can be readily detached and used for closure as aforedescribed.

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 an embossed pattern in the body of the strap material to add to the security of the strap in its use as a closure device by imparting more resilient strength to the strap wall in the interlocking position. However, for some applications, a smooth surface is suitable.

The size specifications of the closure device of the present invention may vary according to its prospective use. For many usages, a strap as embodied herein is suitable when comprised of a suitable plastic material from about 3 mils to about 6 mils or more in thickness, from about 5 to about 7 inches in length and from about ¾ to about 1½ inches in width, and in which the perforations, when in the form of holes, have a diameter generally about 25 percent of the width of the strap at the area of the perforations. Non-limiting examples of perforations in the present device include circular holes, crossed slits, slits of various orientations, combinations of these and any other suitable configuration of a perforation opening.

A specific example of a closure device of the present invention, generally suitable for closure of plastic garbage bags and food bags comprises as **6** mils thick embossed polyethylene film of the configuration shown in FIG. **5** having an overall length of 6 inches, a width of 1 inch at the area defined by 3 inch parallel side edges

18 and 18 and circular holes (12, 13, and 13') ¼ inch in diameter disposed in the strap with perforation 12 being about ½ inch from end 17 and the remaining holes being disposed on the substantially longitudinal center line of the device towards the other end of the strap.

As illustrated in FIG. 8, a thermoplastic bag 30 is shown with a flexible, plastic, locking strap 31 detachably secured adjacent the open mouth 32 of bag 30. Locking strap 31 is affixed to the bag utilizing a pressure sensitive adhesive. Such adhesive may be coated on one side of the locking strap or on the surface of bag wall. Conversely, as shown in FIG. 9-A the locking strap, or bag closure element 31, may be detachably secured to bag 30 utilizing tape 33, e.g. paper or plastic, coated with an adhesive.

FIG. 9-B is an illustration, similar to FIG. 6, illustrating a bag, the gathered mouth of which has been securely fastened utilizing the locking strap 31, shown detachably affixed to the bags of FIGS. 8 and 9-A. As shown, in FIG. 9-B, the bag mouth is secured by passing, through the single perforation 34 at one end of locking strap 31, the opposite end 35 of strap 31 and tightening the thereby formed noose around the bag mouth. The strap releasably locks into position when the noose is of suitable circumference, as a result of the flexible protrusions 36 lockingly engaging the edges of perforation 34.

As hereinbefore noted, FIGS. 10, 11 and 12 are shown as examples of locking straps having a locking principle substantially similar to locking strap 31. Such straps are shown, by way of example, in connection with the type of closure strap which may be employed within the scope of the present invention.

The present invention enables, for example, a user of disposable bags, such as trash can liners, lawn debris and leaf bags and the like to have, after such bags are filled and ready for closure, a readily accessible closure device, the device being immediately at hand by virtue of its being detachably secured adjacent the open mouth of the bag it is desired to close. Such an arrangement is in sharp contrast with prior art closure devices for this type of bag where closures are generally packaged loosely, in a common container with the bags, but not releasably attached thereto as in the case of the present invention.

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 this invention, as those skilled in the art will appreciate. Such variations and modifications are therefore considered to be within the purview and scope of the appended claims.

What is claimed is:

1. A device for closure of flexible bag structures which comprises a flexible elongated strap having at least two longitudinally spaced-apart perforations, one end of said strap being elongatedly tapered such that said tapered end may be inserted into and pulled through one of said perforations spaced-apart from another of said perforations said latter perforation being intermediate said tapered end portion (being inserted) and said perforation through which said end portion is inserted to form a noose, said elongatedly tapered strap end being further characterized by having outwardly projecting shoulders at opposite edges of said strap, approximately at the point where said flexible strap begins to taper, whereby when said noose is formed and said elongatedly tapered end is pulled through said perforation at said end portion of said strap, said intermediate perforation engages with the perforation through which said end portion is inserted to provide for said noose, a lock which is further reinforced by engagement of said shoulders with the engaged perforations.

* * * * *