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Ballin

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[54] **TIE STRIP**

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[73] Assignees: **Betty Ballin,** Locust Valley; **Jean Cohen; Martin Schulman,** both of Great Neck Estates, all of N.Y.

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[52] **U.S. Cl.** **24/16;** 24/30.5

[51] **Int. Cl.²** **B65D 63/00**

[58] **Field of Search** ..... 24/16 PB, 30.5 P, 17 PB

[56] **References Cited**

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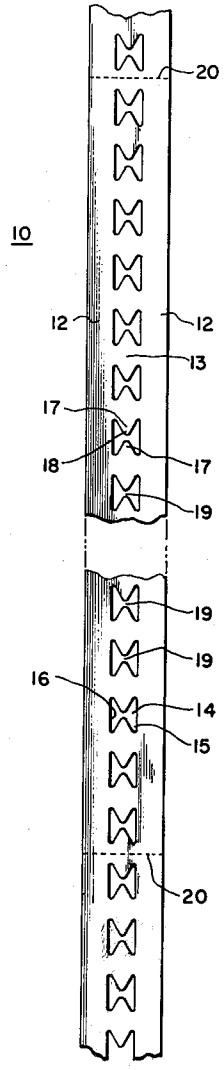
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Attorney, Agent, or Firm—Howard C. Miskin

[57] **ABSTRACT**

A tie strip is formed of a flexible resilient material in strip form, with regularly longitudinally spaced openings formed in the strip and a pair of oppositely directed pawl acting tongues projecting from opposite end edges of each opening toward each other. The strip, in application, is folded at its end about its medial axis and inserted in a selected opening and it is movable through the opening in only one direction when inclined to the strip at the engaging opening in such direction and is movable in the opposite direction upon reversal of the inclination, the opposite tongues functioning as opposing pawls.

7 Claims, 4 Drawing Figures



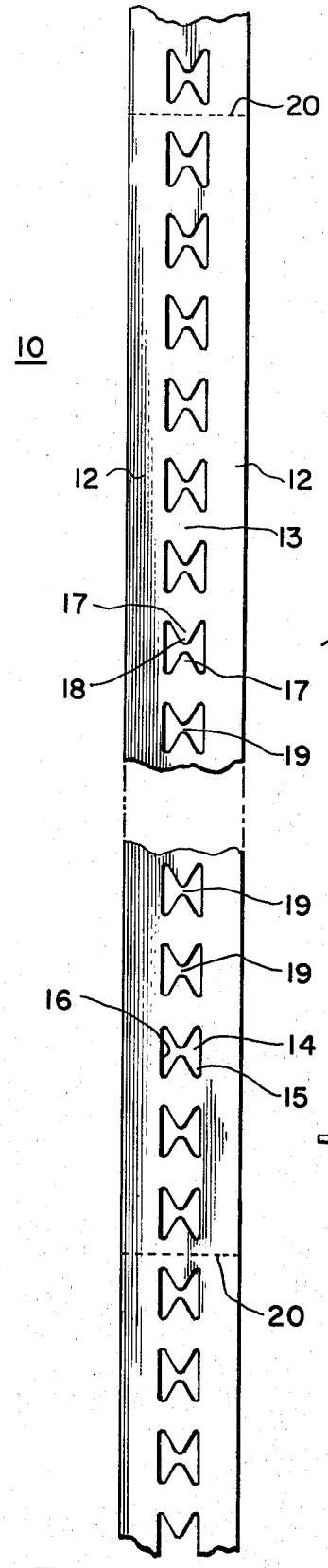


Fig. 1.

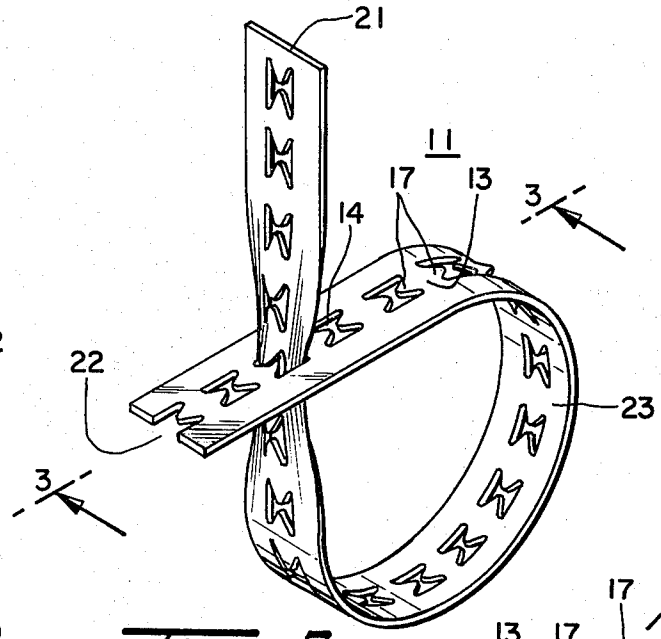


Fig. 2.

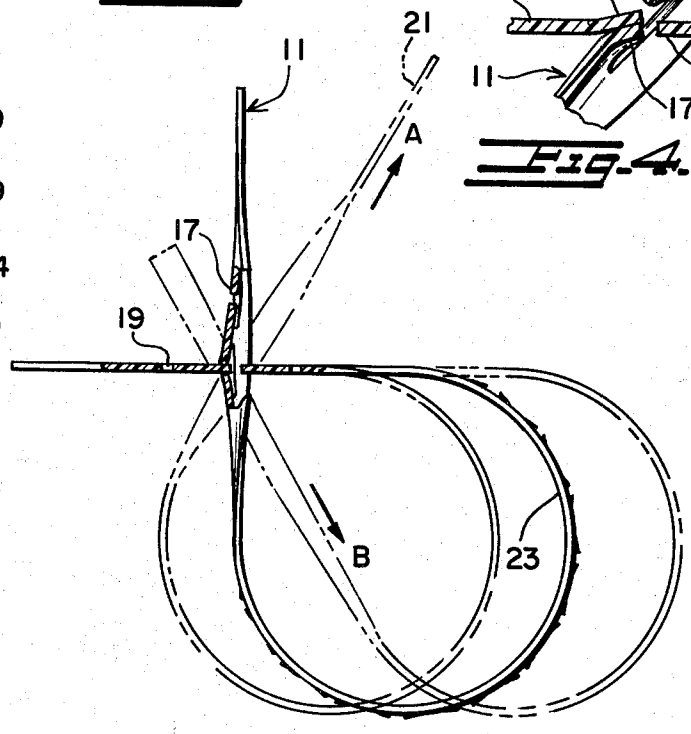


Fig. 3.

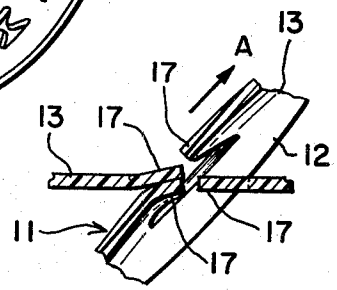


Fig. 4.

TIE STRIP

BACKGROUND OF THE INVENTION

The present invention relates generally to improvements in fastening devices and it relates generally to an improved tie strip for application to bags or other containers for maintaining the closure thereof, to bunches of articles or to other uses.

It is a common practice in releasably securing bags in a closed condition to gather the border of the bag proximate its open end into a closed neck and applying a tie strip or other fastener or tie to the closed neck. This procedure is followed in a wide variety of applications such as to paper bags, plastic bags, net bags and the like which are used for fruits, vegetables and other foodstuffs, trash, garbage and the like. However, the fastening devices heretofore employed possess numerous drawbacks and disadvantages. They are unreliable, often difficult and inconvenient to apply or remove, relatively expensive, and of little versatility and adaptability and otherwise leave much to be desired.

SUMMARY OF THE INVENTION

It is a principal object of the present invention to provide an improved fastening device.

Another object of the present invention is to provide an improved tie or binding device.

Still another object of the present invention is to provide an improved reusable tie strip having smooth side edges which is highly useful in releasably locking a bag or similar receptacle which is closed by gathering the neck thereof, in binding a stack of articles or a container.

A further object of the present invention is to provide a device of the above nature which is characterized by its reliability, simplicity, low cost, ruggedness, attractive appearance, ease and convenience of use and manufacture and great versatility and adaptability.

The above and other objects of the present invention will become apparent from a reading of the following description taken in conjunction with the accompanying drawing which illustrates a preferred embodiment thereof.

In a sense the present invention contemplates the provisions of an improved tie strip comprising an elongated, pliable resilient strip flexible about its longitudinal spaced openings formed therein along the medial axis and a flexible resilient tongue registering with each of the openings and projecting longitudinally from an end edge of the respective opening and being integrally formed with the strip.

In its preferred construction the side borders or edges of the strip are continuous and thicker than its medial portion. Advantageously, the openings are of rectangular shape and are regularly, longitudinally spaced and a pair of tongues register with each opening and are of generally triangular shape with their bases coinciding with the opening end edges and their apices directed toward each other and slightly longitudinally spaced. The strip is advantageously formed of a thermoplastic organic polymeric resin.

The improved tie strip is easy and convenienntto apply and tighten and to loosen and remove, and in its tightened condition it is highly secure and is not likely to be accidentally released. The tie strip is inexpensive, of attractive appearance and of great versatility and adaptability and can be used to decoratively tie packages.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a fragmentary plan view of a tie strip embodying the present invention from which the individual tie strip devices are cut;

FIG. 2 is a perspective view of a tie strip device in a tying condition;

FIG. 3 is a sectional view taken along line 3—3 in FIG. 2; and

FIG. 4 is an enlarged fragmentary detailed view of the intercoupled portion thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings which illustrate a preferred embodiment of the present invention, the reference numeral **10** generally designates the tie strip stock from which the individual tie strips **11** are cut to the desired lengths depending on their ultimate applications. The strip stock is produced by any suitable method such as by continuous extrusion and cutting and is advantageously formed of a thermoplastic synthetic organic polymeric resin such as a polyolefin, for example, polyethylene or polypropylene, polyvinyl chloride or the like. Other resilient materials can be used, including metals.

As shown, the longitudinal side borders or edges **12** of the stock **10** are smooth, continuous and thicker than the medial section of web **13,** which constitutes a major portion of the strip. The strip **11** including the web **13** is resilient and flexible and is resiliently foldable about its longitudinal medial axis. The width of the stock or strip as well as the length of the cut strip **11** may be as desired, depending on its end use, for example, it may have a width of ⅝ inch and a length of about **5** inches.

Medially formed in the web **13** are regularly longitudinally spaced openings **14** of roughly transversely extending butterfly configuration. More specifically each opening **14** may be considered to be of rectangular or square configuration with longitudinal side edges **16** and transverse end eges **15.** Projecting inwardly from each of the opening end edges **15** is a pawl defining generally triangular tongue **17** of equilateral configuration. The tongues **17** are integrally formed with the web **13** and their bases are substantially coextensive and coninicide with the opening end edges, and their apices **18** are rounded and medially located. The apices **18** of the pair of tongues **17** registering with each opening are longitudinally spaced by a necked space **19.** The tongues **17** are resilient and are normally coplanar with the web **13.**

The stock **10** is cut into the individual tie strips **11** of the desired length along cut lines **20.** If desired, tie strips **11** can coverge to form a pointed leading edge.

Considering now the operation of the improved tie strip **11,** in application, the strip **11** is wrapped around the article to be tied, for example the necked portion of a closed bag, and the leader **21** is bent downwardly about its longitudinal medial axis and inserted into an opening **13** proximate the article being tied to form a closed loop **23.** The loop **23** is tightened by pulling the leader **21** and the opposite end **22** in opposing directions. In the above relative orientation, the advance of the leading portion of the strip **11** through an opening

14 is permitted, since with the advance of the strip through the opening, the strip is longitudinally folded by the contracting opening 14 and the trailing tongues 17 in the successive openings 14 of the advancing portion of the strip 11 sequentially bend the trailing tongue 17 in the threaded opening 14 to allow the passage of the strip 11 therethrough as best seen in FIG. 4.

However, retraction or reverse movement of the leader portion through the opening is prevented, since upon such reverse movement, a leading tongue 17 in the leader portion moves into engagement with the top or outer face of the trailing tongue 17 in the threaded opening and bends outwardly to overlap the latter tongue and effect an interlocking relationship. If it is desired to loosen or open the loop 23, the inclination of the pierced portion of the strip 11 is reversed and is pulled in the direction of arrow B, as shown in FIG. 3, to open the loop 23. The relationship of the tongues 17 in the reverse movement of the leader portion when the opposite relative inclination is effected is similar to the relationship of the tongues with the advance movement of the leader portion at the initial tightening inclination in the direction of arrow A.

While there has been described and illustrated a preferred embodiment of the present invention, it is apparent that numerous alterations, omissions and additions may be made without departing from the spirit thereof.

While the preferred embodiment illustrated strip 11 having thicker side edges, the tape can be flat or uniform in thickness. Also, for rough usage, a reinforcing wire can be added along the side edges in a manner well known to the trade. Also, the pawl tongues have been illustrated as being generally triangular; they may be semi-circular.

What is claimed is:

1. A tie strip comprising an elongated pliable resilient strip flexible about its longitudinal medial axis and having longitudinally spaced similar openings formed therein, and at least one flexible resilient tongue registering with each of said openings and projecting longitudinally from an end edge of the respective opening and being integrally formed with said strip, and end edge of said longitudinally spaced openings being generally transverse to the longitudinal axis of said stip, wherein the strip is flexed along its longitudinal axis and passed through one of said openings to form a loop, with the tongue of the openings along the advancing portion of the strip through said one opening sequentially bending the tongue of said one opening, and the tongue of said one opening resisting expansion of said loop by interlocking with the leading edge of the cooperating other opening.

2. The tie strip of claim 1 including a pair of said resilient tongues registering with each of said openings and projecting longitudinally towards each other from longitudinally spaced opposite edges of the respective opening.

3. The tie strip of claim 2 wherein the free ends of the tongues registering with each of said openings are longitudinally spaced.

4. The tie strip of claim 1 wherein each of said tongues includes side edges converging longitudinally toward their respective free ends.

5. The tie strip of claim 1 wherein each of said openings is of substantially rectangular configuration having transversely extending end edges and including a pair of said resilient tongues registering with each of said opening each of said tongues being of triangular shape with its base coinciding with an opening end edge and a medially located apex at its free end.

6. The tie strip of claim 5 wherein the longitudinal side edges of said strip are of greater thickness than the medial portion thereof.

7. The tie strip of claim 1 wherein said tongues are of generally semi-circular shape with its base coinciding with an opening end edge.

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