

Aug. 31, 1965

S. AUSNIT

3,203,062

DOUBLE HINGED FASTENER

Filed Sept. 7, 1962

2 Sheets-Sheet 1

FIG. 1

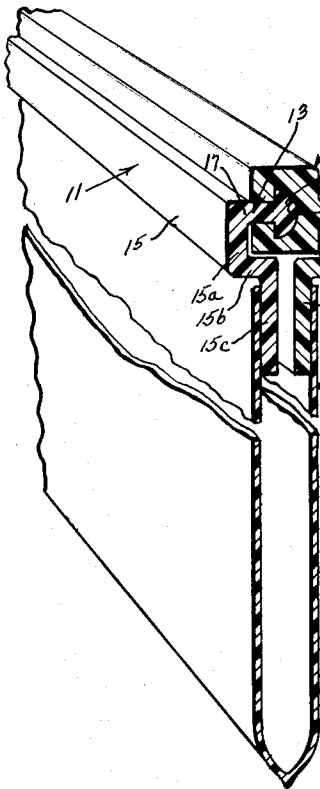


FIG. 3

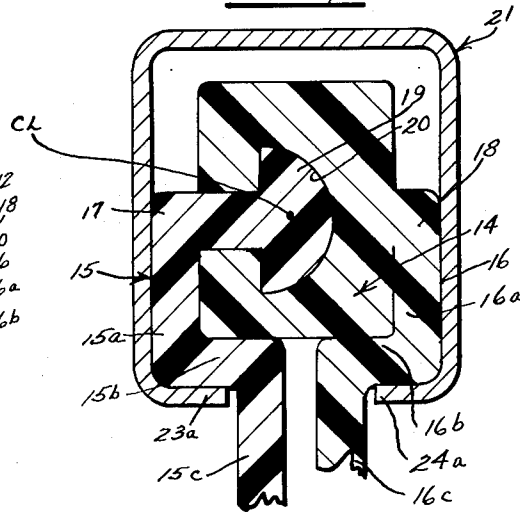


FIG. 4

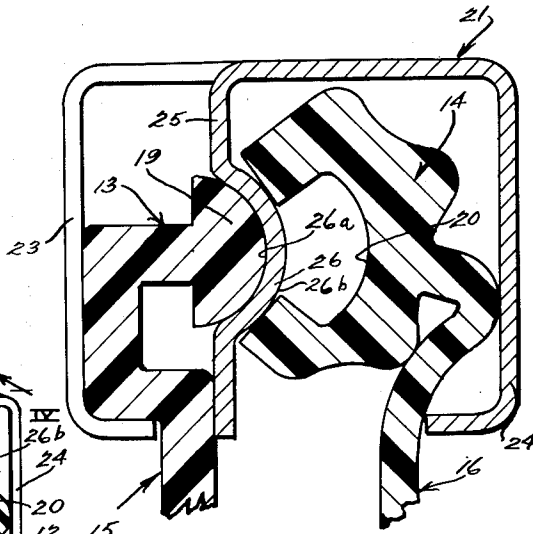
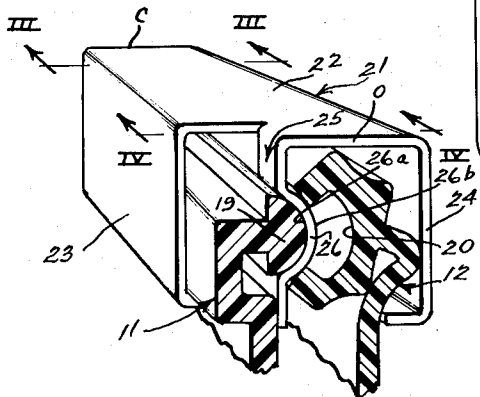


FIG. 2



INVENTOR  
STEVEN AUSNIT

BY

*Hill, Sherman, Merri, Cross & Simpson*  
ATTORNEYS

Aug. 31, 1965

S. AUSNIT

3,203,062

DOUBLE HINGED FASTENER

Filed Sept. 7, 1962

2 Sheets-Sheet 2

FIG. 5

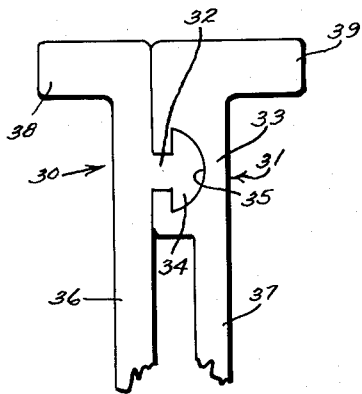


FIG. 6

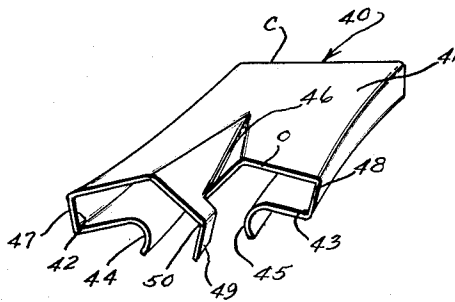


FIG. 8

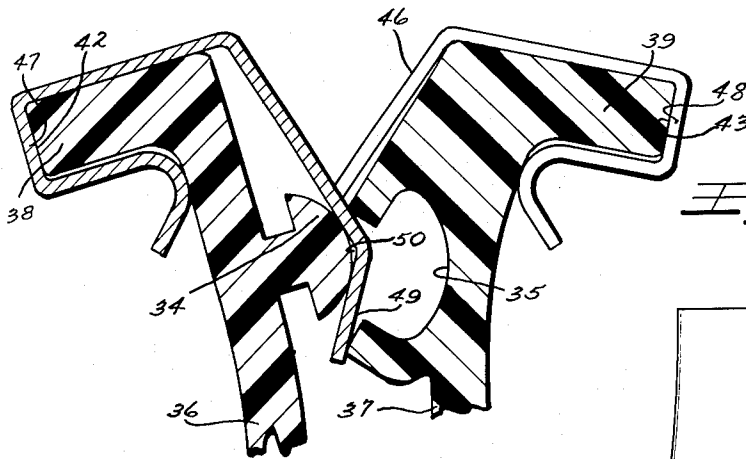


FIG. 7

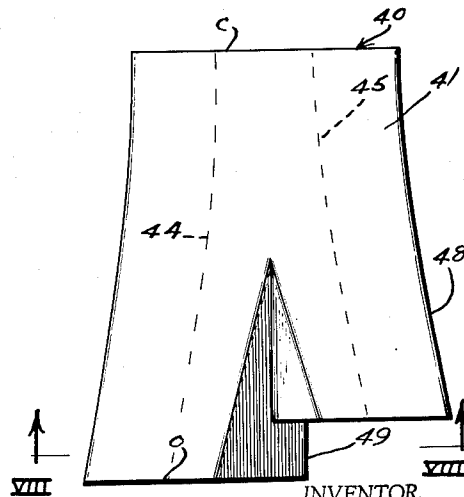
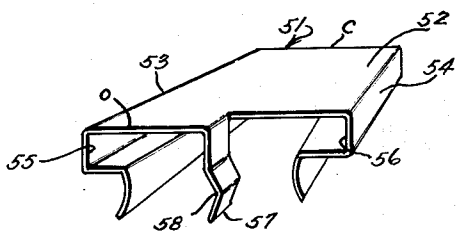


FIG. 9



INVENTOR.  
STEVEN AUSNIT

BY

Hill, Sherman, Meroni, Gross & Simpson  
ATTORNEYS

1

3,203,062

## DOUBLE HINGED FASTENER

Steven Ausnit, 124 E. 61st St., New York, N.Y.

Filed Sept. 7, 1962, Ser. No. 222,016

3 Claims. (Cl. 24-201)

The present invention relates to improvements in a flexible closure assembly and particularly to improved flexible fastener strips having coating releasable pressure interlocking elements on their confronting surfaces, and also relates to an improved slider for separating the strips.

The invention contemplates providing a pair of plastic flexible closure strips each having a marginal portion with releasable pressure interlocking elements such as an arrow shaped rib element on one of the marginal portions and a coactingly shaped groove element on the other of the marginal portions. Web portions are attached to the marginal portions for attaching to the downwardly extending walls of a pouch or bag. A feature of the invention is the hinged connection between the marginal portions and the web portions on each of the strips which permit the web portions to bend outwardly relative to the marginal portions, such as occurs with the loading of a bag to which the strips are attached, without applying bending forces to tend to separate the strips and maintaining the interlocking elements in their optimum position for resisting separation. Each of the web portions is attached to its marginal portion by a laterally extending integral hinge portion.

The invention also provides a slider for separating opposed fastener strips with releasable pressure interlocking elements thereon including a rib element and a groove element with the opening end of the slider having a separating finger with a concave surface for slidably receiving the rib element and withdrawing it from the groove element. The separating finger is rigidly and economically formed to have surfaces extending in the direction of movement of the slider and is formed from material of the back and one of the sides of the slider.

An object of the invention is to provide improved flexible fastener strips having features which promote improved resistance to separation.

A further object of the invention is to provide an improved slider for separating fastener strips wherein the slider has features for improved separation and/or joining flexible closure strips, and wherein the slider is simply and economically made.

A further object of the invention is to provide an improved opening and closing slider for flexible closure strips wherein the slider can be formed or bent from a single piece of metal, and has improved features of strength.

A further object of the invention is to provide an improved closure strip structure with the strips providing a secure reopenable interlock for the top of a pouch or bag and wherein the strips will remain interlocked against forces caused by a loaded bag to which the strips are attached.

Other objects, advantages and features will become more apparent with the teaching of the principles of the present invention in connection with the disclosure of the preferred embodiments thereof in the specification, claims and drawings, in which:

FIGURE 1 is a perspective view with portions broken away illustrating a pouch and fastener strips embodying principles of the present invention;

FIGURE 2 is a fragmentary perspective view, with a section taken vertically through the closure strips, of a slider mounted on the strips for joining or separating the strips;

FIGURE 3 is a vertical sectional view taken substan-

2

tially along line III—III at the closing end of the slider of FIGURE 2;

FIGURE 4 is a vertical sectional view taken substantially along line IV—IV at the opening end of the slider of FIGURE 2;

FIGURE 5 is an end elevational view of a form of closure strips;

FIGURE 6 is a perspective view of a slider embodying the principles of the present invention and constructed to be used with the closure strips of FIGURE 5;

FIGURE 7 is a top plan view of the slider;

FIGURE 8 is a vertical sectional view taken substantially along line VIII—VIII of FIGURE 7 and including closure strips to illustrate the action of the slider at the opening end for separating the strips; and

FIGURE 9 is a perspective view of another form of slider for use with the strips of FIGURE 5.

As shown on the drawings, FIGURE 1 illustrates a pouch 10 formed with side walls and a flexible closure at the top for opening and reclosing the pouch 10. The closure includes first and second closure strips 11 and 12 each having marginal portions 13 and 14. Below the marginal portions are web portions 15 and 16 for attachment of the strips to the upper edges of the pouch 10.

The marginal portions 13 and 14 include releasable pressure interlocking elements in the form of an arrow shaped bead or rib 19, FIGURES 1 through 4, and a complementary shaped recess or groove 20.

Below the marginal portions for attachment to the pouch are web portions 15 and 16. The web portions are attached to the marginal portions by laterally extending hinge portions 17 and 18 respectively. The hinge portions are integral with both the marginal portions and web portions, and permit relatively easy bending or flexing of the web portions and bag side walls. This flexing or bending occurs particularly when the bag is loaded and the walls are pressed outwardly by the contents of the bag 10. Whereas this frequently has heretofore created a force on the strips which tends to separate the closure strips, in the present arrangement the strips will maintain a position wherein they have the greatest resistance to separation. If the web portions are pulled in opposite horizontal directions, for example, the line of action will be through the longitudinal centerline CL of the interlocking elements and they will not twist or tilt, but will remain in the position shown. As either of the web portions 15 or 16 is drawn outwardly, the hinge portions 17 and 18 will freely flex and the pull on the interlocking rib and groove elements 19 and 20 will be through their centerline. Accordingly, the hinge portions 17 and 18 are attached laterally opposite the longitudinal centerline CL of the marginal portions which is the center of the interlocking elements, FIGURE 3. The hinge portions are sufficiently thin to flex as the web portions flex outwardly and are shown with the same thickness as the web for convenience of illustration. Since the material of the bag 10 may be only a few thousandths of an inch, for clarity the drawings must show the elements thicker than the actual structure. They are preferably as thin as the web portions or thinner to insure flexing and to insure a hinge action and to prevent applying a bending force to the marginal portions.

The web portions 15 and 16 extend downwardly from the hinge portions 17 and 18 in downwardly extending first portions 15a and 16a respectively. The web portions then turn toward each other below the marginal portions in laterally inwardly extending second web portions 15b and 16b. The second web portions then turn downwardly in downwardly extending third web portions 15c and 16c which are attached to the top edges of the bag 10. This brings the web portions 15b and 16b towards each other with their inner surfaces following the outer sur-

face of the marginal portion 14 providing a compact unit not susceptible to being opened accidentally.

The closure strips are of a suitable flexible plastic material, and suitable materials include the thermoplastic and thermosetting organic synthetic resins, and the strips are commonly transparent or translucent colorless plastic. Of particular importance for this use are the vinyl type resins such as polyvinyl chloride, polyvinyl acetate, polyvinyl chloride-polyvinyl acetate copolymers, and similar vinyl resins, and polyethylene. Rubber, either natural or synthetic, is not a preferred material since, in the case of rubber, it is more difficult to control the degree of rigidity for interlocking engagement between the strips. However, by proper compounding and vulcanizing the rubber, the degree of rigidity can be controlled to make rubber acceptable for purposes of the instant invention.

FIGURES 2 through 4 illustrate a slider 21 which straddles the top edge of the closure strips and is movable either in an opening or closing direction to separate or join the closure strips 11 and 12.

The slider 21 is formed of a suitable material such as metal and is formed integrally of one piece with a back portion 22. Turned downwardly and integral with the back portion are side portions 23 and 24, and the side portions are tapered toward each other toward a closing end C of the slider so that the inner planar surfaces thereof press the strips together when the slider is moved in a closing direction.

The lower edges 23a and 24a of the sides are turned inwardly to extend beneath the shoulders formed by the inwardly extending portions 15b and 16b of the web portions of the strips, and this retains the slider in place on the strips.

For separating the strips 11 and 12 when the slider 21 is moved in an opening direction, a separating finger 25 projects downwardly at the opening end O of the slider between the sides 23 and 24. The finger uniquely has surfaces extending in a longitudinal direction with respect to the direction of slider movement, and has a jog or a bend 26 with a laterally facing concave surface that slidably receives the arrow shaped bead 19 of the strip 11. This concave surface 26a in effect pulls the rib fastener element 19 from the groove fastener element 20, when the slider is used in an opening direction. The shaped jog 26 projects into the groove 20 and has a separation effect, camming the upper and lower portions of the groove apart as illustrated in FIGURE 4 to aid in the separation, and the outer surface 26b projects into the groove.

The finger 25 is uniquely formed from the material of the slider being cut from the back 22 and the side 23 and bent downwardly. Thus, one side of the back 22, and the side 23 will be shorter than the other side of the back, and the other side 24. The finger extending with planar surfaces in a longitudinal direction provides good strength in the sliding directions, and is conveniently made without requiring the provision of additional material, and is integral with the material of the slider.

The slider is also conveniently shaped to conform to the cross-sectional profile of the strips, and the back, sides, and inwardly turned lower edges of the sides, along with the jog 26 formed in the finger 25, all coact to maintain the slider in its proper position on the strips 11 and 12 and aid in facilitating easy movement of the slider and prevent binding on the strips.

FIGURE 5 illustrates another form of closure strips 30 and 31. The strips have marginal portions 32 and 33 respectively having releasable interlocking elements 34 and 35, with the element 34 presenting an arrow shaped rib, and the element 35 presenting a cooperatively shaped groove.

Projecting laterally from each side of the marginal portions 32 and 33 are flanges 38 and 39. Extending downwardly are web portions 36 and 37 for attaching the strips to a bag or pouch.

FIGURES 6 through 8 illustrate a slider 40 for the strips 30 and 31 of FIGURE 5.

The slider 40 is formed of one piece of material such as metal, and has a closing end C and an opening end O. The slider has a back portion 41 with integral downwardly extending bent shaped sides 47 and 48 which are bent to provide channels 42 and 43. The sides are additionally turned inwardly and downwardly to provide lower portions 44 and 45 which aid in closing the strips, and which also aid in retaining the slider on the strips.

The slider in effect provides a T-shaped slot extending therethrough for receiving the T-shaped strips 30 and 31.

The sides 47 and 48 are shaped so that the channels 42 and 43 turn downwardly at the opening end O of the slider so as to apply a bending force to the strips to bendingly pry them apart and aid in separation of the strips, FIGURE 8.

The back portion 41 and the sides 47 and 48 taper together toward the closing end C of the slider 40 for closing the strips and forcing together the interlock elements 34 and 35 when the slider is moved in a closing direction. The sides are bent inwardly and downwardly at 44 and 45 and these bottom portions also taper together toward the closing end to aid in joining the strips. The lower portions 44 and 45 of the sides also hold the slider on the strips engaging beneath the lateral flanges 38 and 39.

At the center of the opening end of the slider 40, the back 41 is bent downwardly to form a V-shaped separator 46 which aids in bending the strips 30 and 31 laterally outwardly, as shown in FIGURE 8, and aids in separating the strips.

Centrally located at the opening end and extending downwardly is a separating finger 49. The finger is formed from being cut from one side of the back 41 and is integral with the material of the slider and bent downwardly therefrom, so that the side of the back 41 and the side 48 are shorter than the other side of the back and the side 47. This permits the finger to be formed integral with the material of the slider, and the finger presents longitudinally extending surfaces being strong in the longitudinal sliding direction of the slider.

The finger is shaped with a concave surface 50 which faces the arrow shaped interlocking rib portion 34. The back side of the concave portion 50 projects into the groove interlocking element 35, tending to separate it, and the front concave side functions to pull the rib interlocking element 34 out of the groove element 35.

FIGURE 9 illustrates another form of slider 51, having a back portion 52 with integral downwardly bent side portions 53 and 54. The side portions are shaped so as to form channels 55 and 56 on each side with the slider presenting a T-shaped slot for sliding on the strips 30 and 31.

The slider 51 of FIGURE 9 is a simplified form of the slider of FIGURE 6, with the back portion 52 being flat. A finger 57 is cut from one side of the back portion and from the side, and is turned downwardly intermediate the sides 53 and 54 and bent to form a jog presenting a concave surface 58 facing the bead shaped interlocking element 34. The finger thus projects into the groove 35, and withdraws the bead 34 from the groove as the slider is moved in an opening direction. The slider is formed from one piece of material and presents a simplified strong compact unit.

Thus it will be seen that I have provided an improved flexible closure structure with a slider which meet the objectives, features and advantages above set forth. The closure strips are hinged by laterally extending hinge portions 17 and 18, FIGURE 1, at each side of the strip, and the marginal portions 15 and 16 turn together beneath the strips to provide convenient shoulders for holding the slider 21 in place. The slider 21 is formed of one piece with the separating finger 25 being formed therefrom,

5

and having a uniquely shaped concave portion 26 which effectively peels the rib interlocking portion 19 from the groove interlocking portion 20.

The drawings and specification present a detailed disclosure of the preferred embodiments of the invention, and it is to be understood that the invention is not limited to the specific forms disclosed, but covers all modifications, changes and alternative constructions and methods falling within the scope of the principles taught by the invention.

I claim as my invention:

1. A flexible closure structure comprising first and second opposed flexible strips having releasable pressure interlocking elements including a rib element and a groove element, a laterally outwardly extending flange on each of the strips, a slider on the strips, means on the slider tapering downwardly and engaging the upper surface of said flanges for applying forces to help bend the strips apart, and means on the slider for applying a separating force to the strips by engaging the rib element and by projecting into the groove element so as to pull the rib element out of the groove element.

2. A flexible closure structure comprising first and second opposed flexible strips having side-by-side web portions with marginal portions at the upper edge thereof with the marginal portions having releasable pressure interlocking elements thereon including a rib element and a groove element, a laterally outwardly extending flange on the marginal portion of each of the strips, a slider positioned to straddle over the top of the strips having a back with integral sides extending downwardly therefrom, said sides shaped to form channels receiving said flanges, said channels sloping downwardly at the outer edges toward an opening end of the slider for applying a downward bending force to the lateral flanges to tend to separate the strips, and a finger projecting downwardly between the slider sides at the opening end of the slider for completing the separation of the rib and groove elements.

3. A flexible closure structure comprising first and sec-

6

ond opposed flexible strips having side-by-side web portions with marginal portions at the upper edge thereof with the marginal portions having releasable pressure interlocking elements thereon including a rib element and a groove element, a laterally outwardly extending flange on the marginal portion of each of the strips, a slider positioned to straddle over the top of the strips having a back with integral sides extending downwardly therefrom, said sides shaped to form channels receiving said flanges, said channels sloping downwardly at the outer edges toward an opening end of the slider for applying a downward bending force to the lateral flanges to tend to separate the strips, a V-shaped separation portion formed in the back at the opening end of the slider to further tend to separate the strips, and a separating finger cantilever supported on the back projecting downwardly between the sides for completing the separation of the rib and groove elements.

#### References Cited by the Examiner

##### UNITED STATES PATENTS

1,666,110	4/28	Statham	24—205.12
1,703,712	2/29	Aud	24—201.3
1,959,319	5/34	Sipe	24—201.3
2,613,421	10/52	Madsen	24—201
2,736,079	2/56	Staller	24—201
2,764,793	10/56	Sander	24—201
2,780,261	2/57	Svec	24—201.3
2,794,228	6/57	Teher	24—201
2,810,944	10/57	Sander	24—201.3

##### FOREIGN PATENTS

1,034,230	7/53	France.
1,137,102	5/57	France.
1,226,580	7/60	France.
1,168,794	12/58	France.
636,072	4/50	Great Britain.

DONLEY J. STOCKING, *Primary Examiner.*