June 12, 1962 S. AUSNIT 3,038,225

SEPARABLE FASTENER

Filed May 27, 1960

Fig. 1

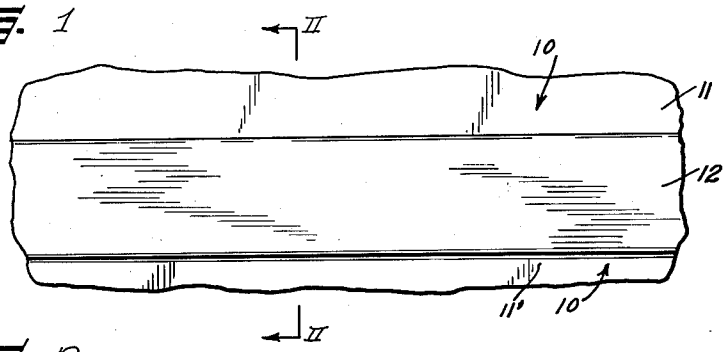


Fig. 2

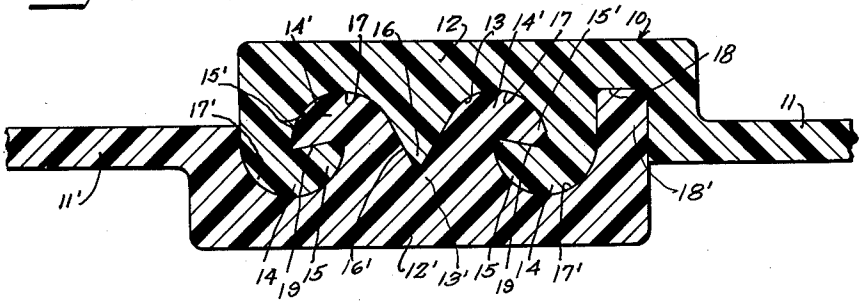


Fig. 3

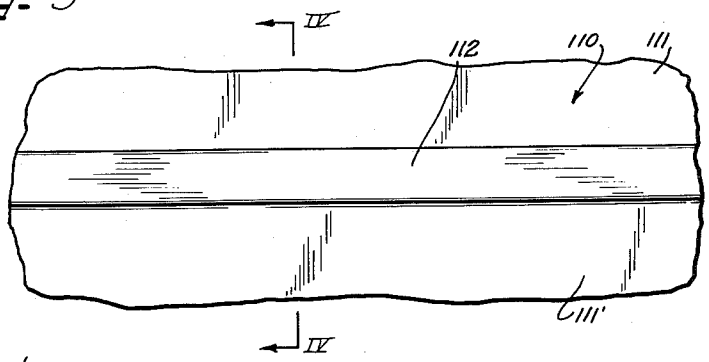
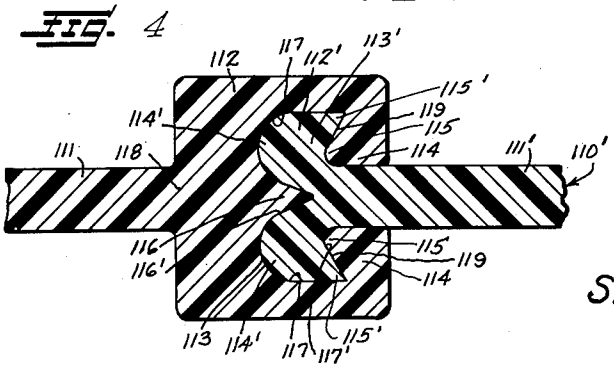


Fig. 4



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SEPARABLE FASTENER

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This invention relates to fasteners for joining and separating two edges of a pouch so that the pouch may be opened and closed.

It has previously been proposed to provide fasteners of the present type by means of a pair of continuous strips of elastic or flexible material adapted to be made in a continuous operation. Fasteners of this kind comprise one part which is provided with one or more hook-like projections along the edge adjacent the other part and a second part which is provided with one or more hook-shaped grooves corresponding to the projection in the first mentioned part.

In the past many attempts have been made in an effort to obtain a reliable and efficient fastener of this kind and one of the main problems has been the tendency of the parts to become disengaged when subjected to a pull or force tending to separate the two parts or edges of the pouch to which the fastener is attached.

It is an object of the present invention to provide an improved fastener having two continuous interengageable strips, whereby a firm grip is obtained so that the two strips are held tightly together.

The present invention comprises in combination two flat strips of resilient material having overlapping webs, and a hook-like groove and projection means is arranged between the webs.

The aforesaid means includes a split head on one of the webs and a wedge-shaped grooved area on another of the strips with the grooves being separated by a wedge-shaped projection so that as the slit head is engaged with the wedge-shaped grooved area, the wedge-shaped projection will spread the hooks or the projections on the split head and thereby guide the hooks into the grooved area.

In one form of the invention, the split head and the split head grooved area are disposed in a plane extending generally transversely of the strips while in another form of the invention, the split head and the split head grooved area are disposed in a longitudinal plane extending generally longitudinally of the strips.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself as to its construction together with additional objects and advantages thereof, will be best understood from the following description of several embodiments when read in connection with the accompanying drawings, in which:

FIGURE 1 is a fragmentary top view of a fastener structure showing the fastener in a closed position;

FIGURE 2 is an enlarged fragmentary cross-sectional view taken substantially on the line II—II looking in the direction indicated by the arrows, as shown in FIGURE 1;

FIGURE 3 is a fragmentary top view of a modified type of fastener structure; and

FIGURE 4 is an enlarged fragmentary cross-sectional view taken substantially on the line IV—IV looking in the direction indicated by the arrows, as shown in FIGURE 3.

The fastener of my invention is indicated generally by the reference numeral **10** and comprises two flexible strips **11** and **11'** formed of a resilient material, such as a thermoplastic material, which may be molded or extruded into the desired finished shape. The strips may be made of thermoplastic synthetic resin materials such as polyvinyl chloride, polyvinylidene chloride, halogenated polyethylenes, polyvinyl acetate, and polyethylene, and copolymers, heteropolymers and mixtures thereof. Such

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materials are substantially impervious to air and moisture, and may be prepared in suitable thin resilient sheets which can be translucent, and substantially transparent, if desired.

Each strip **11** and **11'** has a thickened marginal web portion **12** and **12'**, respectively. The web **12'** has a centrally located split head **13'** which includes a pair of hooks or hook-like projections **14'**. The hooks **14'** have hook ends or projection ends **15'** which extend in opposite directions with respect to one another and which extend generally along the plane of the strips **11**, **11'**. The split head **13'** is possessed of a wedge-shaped grooved area **16'** which is disposed between the hooks **14'**. The web **12'** is provided with a pair of hook-like grooves **17'** which are disposed on opposite sides of the split head **13'** and which open away from the strip in generally the same direction as the wedge-shaped grooved area **16'**.

The web **12** has a split head grooved area **13** for receiving the split head **13'** in snug engagement therein. The grooved area **13** is partially defined by a pair of hooks or hook-like projections **14** having ends **15** which extend generally towards one another. A wedge **16** is disposed between the hooks **14** with the wedge **16** being spaced from the hooks **14** by means of hook-like grooves **17**, the grooves being disposed on opposite sides of the wedge **16** and being adapted to receive the hooks **14'** on the opposite or confronting web **12'**.

The webs **12** and **12'** are provided with a web or strip heel end grooved area **18** and a web or strip elongated web heel end **18'**, respectively. Where the hooks and grooves are engaged with one another, the heel end **18'** is engaged in the heel end grooved area **18** to back-up the engagement of the aforesaid hooks and grooves to resist accidental disassembly.

The web **12** may be assembled with the web **12'** by aligning the split head **13'** with the split head grooved area **13** and by progressively moving the webs towards one another. As the webs **12** and **12'** are moved towards one another the hooks **14** and **14'** become interengaged in the grooves **17** and **17'** and hook end shoulders **19** are interengaged to resist disassembly.

As the wedge on the web **12** is engaged in the wedge-shaped grooved area **16'** on the web **12'**, the hooks **15'** are urged apart and into bottomed engagement within the hook-shaped grooves **17**. When the hooks and grooves are interengaged, the split head grooved area **13** and the split head **13'** are also in assembled relation.

The split head **13'** and the split head grooved area **13** when engaged together, or in other words when connected, are disposed generally in a plane which may be referred to as a connector plane. This plane in this embodiment extends parallel to the plane of the strips. To separate or to join the split head and the grooved area they are moved normal to said connector plane.

Shown in FIGURES 3 and 4 is a modified fastener which is indicated generally at **110**. The fastener **110** is comprised of two flexible strips **111** and **111'** formed of the same material as previously described. Each strip **111** and **111'** has a thickened marginal web portion **112** and **112'**, respectively.

The web **112'** is similar to the web **12'**, previously described, since it has a centrally located split head **113'** which includes a pair of hooks or hook-like projections **114'**. The hook-like projections **114'** extend transversely of the strips and possess hook ends or projection ends **115'**, **115'**. The split head **113'** is also possessed of a wedge-shaped grooved area **116'** which is disposed between the hooks **114'**. The web **112'** is also provided with a pair of hook-like grooves **117'** which are disposed on opposite sides of the split head **113'** and which open in a direction confronting the strip **111'**.

The web **112** has a split head grooved area **113** for

receiving the split head **113'** in snug engagement therein. The grooved area **113** is partially defined by a pair of hooks or hook-like projections **114** having ends **115** which extend towards one another and are disposed in abutting relation on opposite sides of the strip **111'** when the strips are in assembly together. The web **112** is also provided with a wedge **116** and the wedge is adapted to be disposed within the wedge-shaped grooved area **116'**.

The webs **112** and **112'** may be assembled together by aligning the strips in end to end relation and by pulling the hooks **114** apart so that the split head **113'** may be moved into the split head grooved area **113** at which time the hooks **114** are released so that they may engage against the sides of the strip **110'**. It will be noted that as the strips **111** and **111'** are engaged together, the strip **111'** is moved towards a juncture **118** which is disposed between the strip **111** and the web **112**. Once the web portions **112** and **112'** are engaged together, hook end shoulders **119** on the hooks **114** are interengaged to resist disassembly.

The split head **113'** and the split head grooved area **113**, when engaged together, or in other words when connected, are disposed generally in a plane which may be referred to as the connector plane. This plane in this embodiment extends transverse to the plane of the strips. To separate or to join the split head and the grooved area, they are moved normal to the connector plane.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. A fastener structure including a pair of flexible strips having means for sustaining the strips in retained assembly together, and means including a split head on one of said strips with the split head comprised of a pair of hooks with ends of the hooks extending in opposite directions with respect to one another, the hooks on the split head being joined at the base thereof but being separated from one another at outer ends thereof by a wedge-shaped grooved area, another of said strips having a split head grooved area including a pair of hook-shaped grooves separated by a wedge-shaped projection, the hooks on the split head being spreadable by the wedge-shaped projection to guide the hooks on said strip into the hook-shaped grooves on said another strip and with said wedge-shaped projection engaged in said wedge-shaped grooved area between said hooks when said strips are engaged together, said one of said strips having a heel end extending away from the strip on the same side and in the same general direction as said split head, said another of said strips having a heel end grooved area for receiving the heel end and to back up the engagement of the split head in the split head grooved area.

2. A fastener structure including a pair of parallel flexible strips extending longitudinally toward each other, first and second thickened marginal portions on said strips, a centrally located split head including a pair of first hook-like projections on the first marginal portion extending laterally of said strips with hook ends extending away from each other, a V-shaped grooved area between said projections facing laterally of the strips, a pair of hook-like grooves on the second strip having a size and conformation the same as said projections to lockingly receive the projections, a tapered wedge between said grooves for being received by said grooved area, second hook-like projections formed in part by said hook-like grooves and extending laterally on the second marginal portion having hook ends extending toward each other, and grooves formed in part by said first hook-like projections and being on said first marginal portion receiving said second hook-like projections and having the same size and conformation as said second projections.

3. A fastener structure including a pair of parallel flexible strips extending longitudinally toward each other, first and second thickened marginal portions on said strips, a centrally located split head including a pair of first hook-like projections on the first marginal portion extending laterally of said strips with hook ends extending away from each other, a V-shaped grooved area between said projections facing laterally of the strips, a pair of hook-like grooves on the second strip having a size and conformation the same as said projections to lockingly receive the projections, a tapered wedge between said grooves for being received by said grooved area, second hook-like projections formed in part by said hook-like grooves and extending laterally on the second marginal portion having hook ends extending toward each other, second grooves formed in part by said first hook-like projections and being on said first marginal portions receiving said second hook-like projections having the same size and conformation as said second projections, and longitudinally inwardly facing strip end shoulders on the first marginal portion forming part of said second grooves and engaging the longitudinally outer surfaces of the second hooks preventing them from bending outwardly.

4. A fastener structure including a pair of parallel flexible strips extending longitudinally toward each other, first and second thickened marginal portions on said strips, a centrally located split head including a pair of first hook-like projections on the first marginal portion extending laterally of said strips with hook ends extending away from each other, a V-shaped grooved area between said projections facing laterally of the strips, a pair of hook-like grooves on the second strip having a size and conformation the same as said projections to lockingly receive the projections, a tapered wedge between said grooves for being received by said grooved area, second hook-like projections formed in part by said hook-like grooves and extending laterally on the second marginal portion having hook ends extending toward each other, second grooves formed in part by said first hook-like projections and being on said first marginal portions receiving said second hook-like projections having the same size and conformation as said second projections, longitudinally inwardly facing strip end shoulders on the first marginal portion forming part of said second grooves and engaging the longitudinally outer surfaces of the second hooks preventing them from bending outwardly, a heel end projection on the distal end of the first marginal portion extending laterally, and a laterally facing heel end grooved area on the second marginal portion receiving said heel end projection so that said grooves and grooved areas coact with the projections preventing longitudinal displacement thereof.

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