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L. M. DORMAN ET AL

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EXTRUDED FASTENER

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Fig. 1.

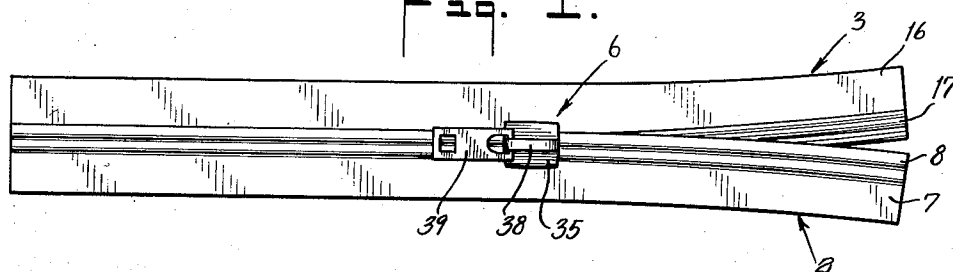


Fig. 2.

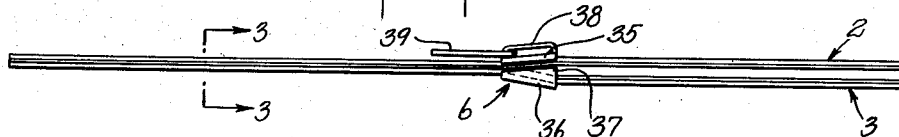


Fig. 3.

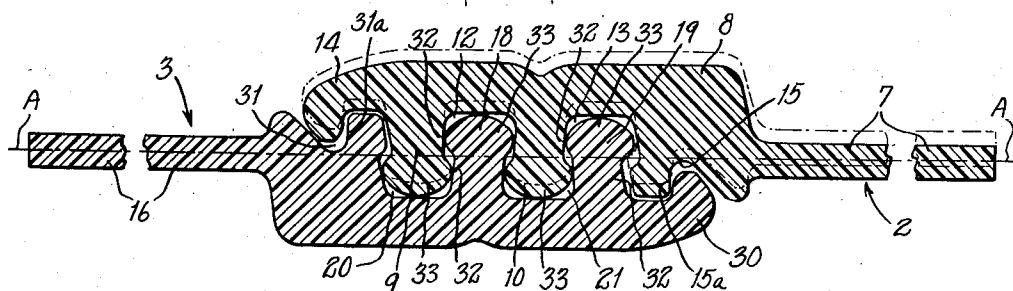
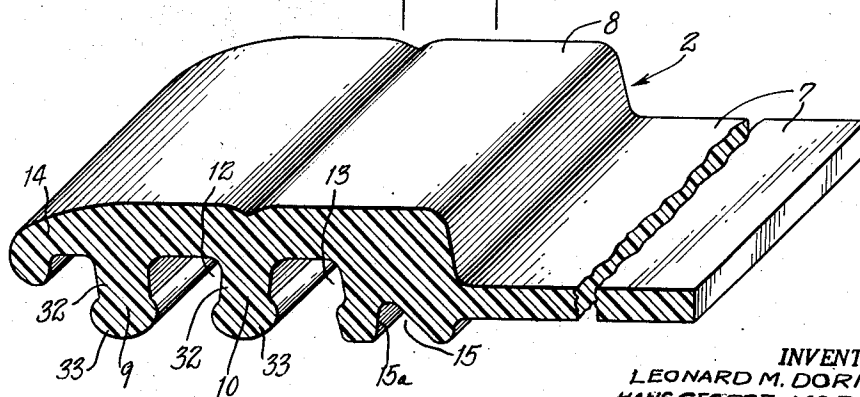


Fig. 4.



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EXTRUDED FASTENER

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4 Claims. (Cl. 24—201)

This invention relates to fastening devices, and more particularly to such devices of the so-called continuous or extruded type for use for closing openings in garments, wearing apparel and other articles.

Various types of fastening devices, such as slide fasteners to which the present invention is related, have been heretofore suggested and used as a closure means. One such type of fastening device consists of a pair of continuous strips of resilient or flexible material of rubber, or a plastic material such as one of the vinyls. These fastener strips are usually formed by extrusion and along the marginal edges of both of the strips, there is provided longitudinally extending ribs or projections and channels with the ribs or projections on one strip corresponding to and engaging with the channels in the other strip. It is to this type of fastening device that the present invention specifically relates.

While various attempts have been made to provide a satisfactory fastener of such construction, such fasteners were not entirely satisfactory for various reasons. In the first place, the construction of the interlocking means carried by the marginal portions of the strip was such that the two strips had a tendency to become disengaged when flexed lengthwise or when subjected to any reasonable lateral pulling force on the sides of the strips thereby defeating the intended purpose of the fastener.

Also, in such fasteners, the free edge along the outer edges of the marginal portions of the strips were not confined and the strip could be easily disengaged merely by forcing a sharp object such as a fingernail in under these free edges thereby easily disengaging the strips. Thus, it will be seen that if these free edges would become accidentally caught on a sharp object when in use the fastener will be unintentionally opened which of course is a disadvantage and troublesome.

Accordingly, it is the general object of the present invention to provide an improved so-called continuous or extruded type fastening device in which the above mentioned disadvantages have been eliminated.

It is another object of the invention to provide an improved continuous or extruded type fastening device in which the depth and height axes of the channels and projecting portions are substantially perpendicular to the web portions of the strips with any lateral forces applied to the web portions being directly opposed to one another substantially in a common plane.

It is a further object of this invention to provide an improved continuous or extruded type fastening device in which the center line of the web portions pass substantially through the abutting interlocked projecting portions substantially at their line of contact in the channels when the strips are engaged thereby preventing accidental disengagement of the two strips by any pulling forces acting laterally on the strips at opposite sides thereof.

It is still another object of the present invention to provide a fastening device consisting of two interengaged strips which are of identical configuration and which can

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be easily and inexpensively formed by extrusion from a suitable plastic material.

Various other objects and advantages of this invention will be more apparent in the course of the following specification, and will be particularly pointed out in the appended claims.

In the accompanying drawings, there is shown for the purpose of illustration, an embodiment which our invention may assume in practice.

10 In these drawings:

Fig. 1 is a plan view of a fastening device constructed in accordance with the present invention with a slider shown thereon in a partially closed position and with the strips separated thereabove showing the projecting rib and channel construction in one of the strips;

Fig. 2 is a side view of the fastener shown in Fig. 1;

Fig. 3 is an enlarged sectional view taken on line 3—3 of Fig. 2; and

Fig. 4 is an enlarged perspective view, partly in section, of one of the strips as shown in Figs. 1 and 2.

Referring more particularly to the drawings, there is shown in Figs. 1 and 2, the improved fastening device of the present invention which comprises a pair of identical strips 2 and 3 having marginal interlocking portions. There is arranged on these marginal interlocking portions, preferably a slider 6, for longitudinal movement therealong for engaging and disengaging these marginal interlocking portions in a well known manner.

As more clearly shown in Figs. 3 and 4, the strips 2 and 3 are preferably formed by extrusion from a suitable plastic resinous material, such as one of the vinyls, polyethylene and the like, which have some degree of elasticity. The strip 2 has a flat, relatively thin web portion 7 and a marginal portion 8 which is substantially thicker than the web portion. There is arranged along one side of the marginal portion 8, a pair of spaced-apart longitudinally extending solid rib-like projecting portions 9 and 10, which are parallel to one another and extend continuously the full length of the strip. There is also provided a pair of corresponding longitudinally extending channels 12 and 13 with one channel 12 positioned between the pair of projecting rib-like portions 9 and 10 and with the other channel 13 being positioned on the inner side of the inner projecting portion 10. Along the outer free edge of the marginal portion 8 on the outer side of the outer projecting portion 9, there is arranged a longitudinally extending substantially hook-shaped lip-like portion 14 and along the inner side of the inner channel 13 of the marginal portion 8, there is arranged a relatively shallow groove or channel 15 so as to provide a shoulder 15a.

The strip 3 is identical with the strip 2 and has a web portion 16 and a marginal portion 17 which is provided with identical rib-like projecting portions 18 and 19, respectively, and channels 20 and 21, respectively, a substantially hook-shaped lip-like portion 30 arranged along the free edge and a relatively shallow groove or channel 31 arranged along the inner wall of the inner channel 20 so as to provide a shoulder 31a. The projections and channels of the respective strips are substantially identical in cross-section so that the projections of one strip will fit into and engage with the channels of the other strip when the marginal edges of the strip are interlocked and the fastener is closed.

Each of the projections 9, 10, 18 and 19 are disposed substantially perpendicular to the planes of the web portions 7 and 16 and have neck portions 32 and an enlarged or bulbous-like head portion 33. That is to say, the head portion of each rib-like projecting portions is enlarged and the neck portion is constricted to the adjacent complementary channels in the strip alternating in side by side

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relation whereby the channels have a restricted opening thereto and an enlarged bottom portion.

It will be noted that each of the marginal portions 8 and 17 have a relatively thick inner edge portion arranged directly next to their respective web portions 7 and 16 in which the respective relatively shallow grooves or channels 15 and 31 are located. It will also be seen that these marginal portions 8 and 17 have a relatively thin outer edge portion which terminate in the respective lip-like portions 14 and 30.

When the fastener strips 2 and 3 are engaged and interlocked with one another, as more clearly shown in Fig. 3, it will be seen that the projections 9 and 10 of the strip 2 will be disposed in the corresponding channels 20 and 21 of the strip 3 and that the projections 18 and 19 of the latter strip will be disposed in the corresponding channels 12 and 13 of the strip 2 in interlocked relation. It will be understood that the dimensions of the projections and channels are such that when the interlocking portions of the strips are nested sufficient clearance is provided to enable lengthwise flexing of the interlocked strips without any danger of separation thereof. Also, it will be seen when the marginal edges are in engagement, the hook-shaped portion 14 on the free edge of the marginal portion 8 of the strip 2 lies over the shoulder 31a with the extreme enlarged free end portion disposed in the channel 31 of the strip 3 and that the hook-shaped portion 30 on the free edge of the strip 3 lies over the shoulder 15a with the enlarged extreme edge being disposed in the channel 15 of the strip 2. This hook-shaped portion arranged on the free edge portions of the strip is one of the most important aspects of the present invention in that the extreme free-edges of the marginal portions of the strips are protected and confined thereby preventing accidental lifting and displacement of the free edges of the strip. In addition, such hook-like lip construction provides an additional sealing action for the interlocked strips when the engaged strips are subject to a fluid pressure, for example.

It will also be noted that when the strips 2 and 3 are interlocked, the web portions 7 and 16 thereof are substantially in the same plane and that the median plane of the web portions passes through each of the projecting portions 10, 9, 18 and 19 immediately inwardly of the enlarged head or bulbous portions 33 thereof. That is to say, the center line, as shown at A—A, of both of the web portions 7 and 16, of the respective strips 2 and 3, passes through the projecting rib-like portions 10, 9, 18 and 19 immediately inwardly of all of the enlarged head portions thereof. There is another important advantage of our construction in that all forces thus tending to open the fastener are in directly opposed relation. That is to say, there is no component of pulling forces tending to twist the marginal portions of the strips so as to cause them to become easily disengaged. It will be seen that when the strips are subject to lateral pulling forces in opposite directions along the plane of the web portions, the rib-like projections tend to engage more firmly, in that laterally applied forces in the planes of the web portions 7 and 16 acting in opposite directions pass through the projecting portions 10, 9, 18 and 19 substantially at the point the inner sides of the heads thereof abut the inner side walls of their respective channels. This is shown clearly in Fig. 3 wherein the strip 2 assumes a position substantially as shown by the broken lines relative to the strip 3 when the strips are subjected to lateral pulling forces.

While there is shown a slider 6 for engaging and disengaging the marginal interlocking portions 8 and 17 of the respective strips 2 and 3, it will be understood that the strips may be engaged merely by forcing the marginal portions together manually, such as by running the thumb and forefinger along the marginal edges and at the same time forcing the marginal portions together into interlocked relation. The slider shown is of the conventional type for operating this type of fastener and consists gen-

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erally of a pair of angularly arranged wing portions 35 and 36 joined together by an inclined inner guide wall 37 so as to provide a divergent channel for receiving the marginal portions of the strips. On the outer side of one of the wing portions, there is arranged a lug portion 38 to which a pull member 39 is pivotally attached for manipulating the slider.

As a result of our invention, it will be seen that there is provided a new and improved type of fastening device which possesses many advantages over similar type fasteners heretofore suggested and used. It will be seen that while the strips are made of a relatively elastic material, the interlocking means of the marginal portions are so constructed and arranged that a firm and secure interlock between the strips is obtained so as to prevent disengagement thereof when the strips are subjected to normal and reasonable lateral forces tending to disengage them. It will also be seen that the confining of rounded lip-like portions along the free edges of the marginal portions of the strips tend to make for a smooth outer contour when the strips are interlocked thereby presenting a neat appearance and tending to prevent unintentional or accidental disengagement of the strips. Such construction also provides additional interlocking means and a firm means for guiding the slider along the marginal portions insuring that the guide walls of the slider engage the strips so as to properly interlock them continuously therealong.

While we have shown and described an embodiment which our invention may assume in practice, it will be understood that this embodiment is merely for the purpose of illustration and description, and that other forms may be devised within the scope of our invention as defined in the appended claims.

What we claim as our invention is:

1. A fastening device of the class described comprising a pair of opposed elongated strips of flexible material, each of said strips having a web portion and a thickened marginal portion, said marginal portions overlapping one another and being substantially identical in cross-section, each of said marginal portions having at least a pair of spaced-apart parallel longitudinally extending projecting rib-like portions integral therewith and a pair of longitudinally extending channels arranged therealong having a cross-section corresponding in shape substantially to the cross-section of said projecting portions, one of said channels being positioned between the pair of said projecting rib-like portions and the other being positioned on the inner side of the inner of said projecting portions, the rib-like projecting portions and channels being of such cross-sectional form that said projecting portions may be forced into the respective channels in sealing and locking engagement therewith due to the elasticity of the material thereof, each of said marginal portions having a relatively thick inner portion arranged directly next to the web portion thereof and a relatively thin outer edge portion, each of said marginal portions having a longitudinally extending groove arranged along the inner relatively thick side thereof and a longitudinally extending lip-like portion arranged along the relatively thin free edge thereof beyond the outer projecting portion, each of the longitudinally extending grooves arranged along the inner relatively thick side of the inner channel of each of the marginal portions having a depth less than that of the longitudinally extending channels therein and each of the longitudinally extending hook-shaped portions with which they co-operate having a height less than that of the projecting rib-like portions, the projecting portions of one strip adapted to be disposed in the corresponding channels of the other strip when the marginal portions are in superposed position and in interlocked relation with the lip-like portion on the free edge of one strip disposed in the corresponding inner groove of the other strip whereby the free edges of the strips are confined and protected against unintentional displacement and provide additional sealing action

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for said marginal portions, the depth and height axes of said channels and first mentioned projecting portions respectively being substantially perpendicular to the plane of their respective web portions, the head portion of each of said first mentioned projecting portions being enlarged with the neck portions thereof being constricted, each of said channels having a restricted opening and an enlarged bottom portion, the web portions of said strips being disposed substantially in the same plane when the marginal portions are interlocked with the center of said web portions being disposed in a plane passing through all the projecting rib-like portions immediately inwardly of the enlarged head portions thereof.

2. A fastening device of the class described comprising a pair of opposed elongated strips of flexible material, each of said strips having a web portion and a thickened marginal portion, said marginal portions overlapping one another and being substantially identical in cross-section, each of said marginal portions having at least a pair of spaced-apart parallel longitudinally extending projecting rib-like portions integral therewith and a pair of longitudinally extending channels arranged therealong having a cross-section corresponding in shape substantially to the cross-section of said projecting portions, one of said channels being positioned between the pair of said projecting rib-like portions and the other being positioned on the inner side of the inner of said projecting portions, the rib-like projecting portions and channels being of such cross-sectional form that said projecting portions may be forced into the respective channels in sealing and locking engagement therewith due to the elasticity of the material thereof, each of said marginal portions having a relatively thick inner portion arranged directly next to the web portion thereof and a relatively thin outer edge portion, each of said marginal portions having a longitudinally extending substantially hook-shaped portion arranged integral therewith along the outer relatively thin free edge thereof beyond the outer projecting portion and a longitudinally extending groove arranged along the inner relatively thick side thereof at a spaced distance from the inner channel, each of the longitudinally extending grooves arranged along the inner relatively thick side of the inner channel of each of the marginal portions having a depth less than that of the longitudinally extending channels therein and each of the longitudinally extending hook-shaped portions with which they co-operate having a height less than that of the projecting rib-like portions, the projecting portions of one strip adapted to be disposed in the corresponding channels of the other strip when the marginal portions are in superposed position and in interlocked relation with the hook-shaped portion on the free edge of one strip positioned in the corresponding inner groove of the other strip whereby the free ends of the strips are confined and protected against unintentional displacement, the depth and height axes of said channels and first mentioned projecting portions respectively being substantially perpendicular to the plane of their respective web portions, the head portion of each of said first mentioned projecting portions being enlarged with the neck portions thereof being constricted, each of said channels having a restricted opening and an enlarged bottom portion, the web portions of said strips being disposed substantially in the same plane when the marginal portions are interlocked with the center of said web portions being disposed in a plane passing through all the projecting rib-like portions immediately inwardly of the enlarged head portions thereof.

3. A fastening device of the class described comprising a pair of opposed elongated strips of flexible material, each of said strips having a web portion and a thickened marginal portion, said marginal portions overlapping one another and being substantially identical in cross-section, each of said marginal portions having at least a pair of spaced-apart parallel longitudinally extending projecting rib-like portions integral therewith and a pair of longitudi-

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nally extending channels arranged therealong having a cross-section corresponding in shape substantially to the cross-section of said projecting portions, one of said channels being positioned between the pair of said projecting rib-like portions and the other being positioned on the inner side of the inner of said projecting portions, the rib-like projecting portions and channels being of such cross-sectional form that said projecting portions may be forced into the respective channels in sealing and locking engagement therewith due to the elasticity of the material thereof, each of said marginal portions having a relatively thick inner portion arranged directly next to the web portion thereof and a relatively thin outer edge portion, each of said marginal portions having a longitudinally extending substantially hook-shaped portion arranged integral therewith along the outer relatively thin free edge thereof beyond the outer projecting portion and a longitudinally extending groove arranged along the inner relatively thick side thereof at a spaced distance from the inner channel, both of said first mentioned channels being substantially of the same depth and both of said projecting rib-like portions being substantially of the same height, each of the longitudinally extending grooves arranged along the inner relatively thick side of the inner channel of each of the marginal portions having a depth less than that of the longitudinally extending channels therein and each of the longitudinally extending hook-shaped portions with which they co-operate having a height less than that of the projecting rib-like portions, the projecting portions of one strip adapted to be disposed in the corresponding channels of the other strip when the marginal portions are in superposed position and in interlocked relation with the hook-shaped portion on the free edge of one strip positioned in the corresponding inner groove of the other strip whereby the free ends of the strips are confined and protected against unintentional displacement, the depth and height axes of said channels and said first mentioned projecting portions respectively being substantially perpendicular to the plane of their respective web portions, the head portion of each of said first mentioned projecting portions being enlarged with the neck portions thereof being constricted, each of said channels having a restricted opening and an enlarged bottom portion, the web portions of said strips being disposed substantially in the same plane when the marginal portions are interlocked with the center of said web portions being disposed in a plane passing through all the projecting rib-like portions immediately inwardly of the enlarged head portions thereof.

4. A fastening device of the class described comprising a pair of opposed elongated strips of flexible material, each of said strips having a web portion and a thickened marginal portion, said marginal portions overlapping one another and being substantially identical in cross-section, each of said marginal portions having at least a pair of spaced-apart parallel longitudinally extending projecting rib-like portions integral therewith and a pair of longitudinally extending channels arranged therealong having a cross-section corresponding in shape substantially to the cross-section of said projecting portions, one of said channels being positioned between the pair of said projecting rib-like portions and the other being positioned on the inner side of the inner of said projecting portions, the rib-like projecting portions and channels being of such cross-sectional form that said projecting portions may be forced into the respective channels in sealing and locking engagement therewith due to the elasticity of the material thereof, each of said marginal portions having a relatively thick inner portion arranged directly next to the web portion thereof and a relatively thin outer edge portion, each of said marginal portions having a longitudinally extending substantially hook-shaped portion arranged integral therewith along the outer relatively thin free edge thereof beyond the outer projecting portion and a longitudinally extending shoulder arranged along the inner relatively thick side thereof at a spaced distance from

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the inner channel, each of the longitudinally extending grooves arranged along the inner relatively thick side of the inner channel of each of the marginal portions having a depth less than that of the longitudinally extending channels therein and each of the longitudinally extending hook-shaped portions with which they co-operate having a height less than that of the projecting rib-like portions, the projecting portions of one strip adapted to be disposed in the corresponding channels of the other strip when the marginal portions are in superposed position and in interlocked relation with the hook-shaped portion on the free edge of one strip disposed over and engaging the corresponding shoulder of the other strip, the depth and height axes of said channels and projecting portions respectively being substantially perpendicular to the plane of their respective web portions, the head portion of each of said projecting portion being enlarged with the neck portions thereof being constricted, each of said channels having a

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restricted opening and an enlarged bottom portion, the web portions of said strips being disposed substantially in the same plane when the marginal portions are interlocked with the center of said web portions being disposed in a plane passing through all the projecting rib-like portions immediately inwardly of the enlarged head portions thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

2,558,367	Madsen	June 26, 1951
2,613,421	Madsen	Oct. 14, 1952
2,615,224	Shur	Oct. 28, 1952

FOREIGN PATENTS

91,376	Netherlands	Dec. 16, 1940
500,389	Belgium	Jan. 31, 1951