

Nov. 30, 1965

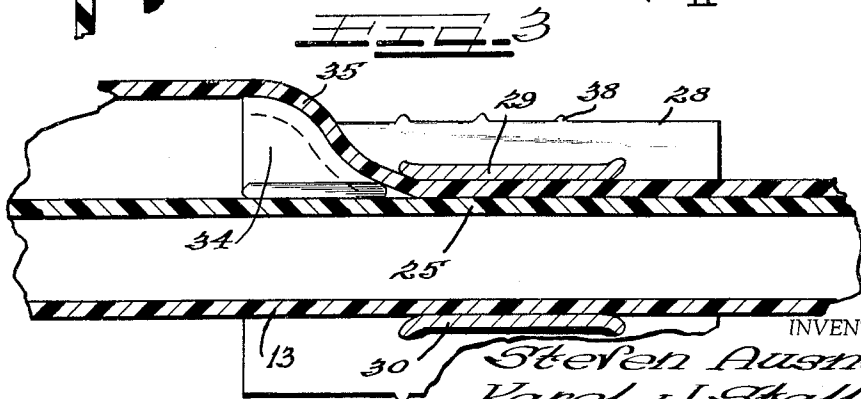
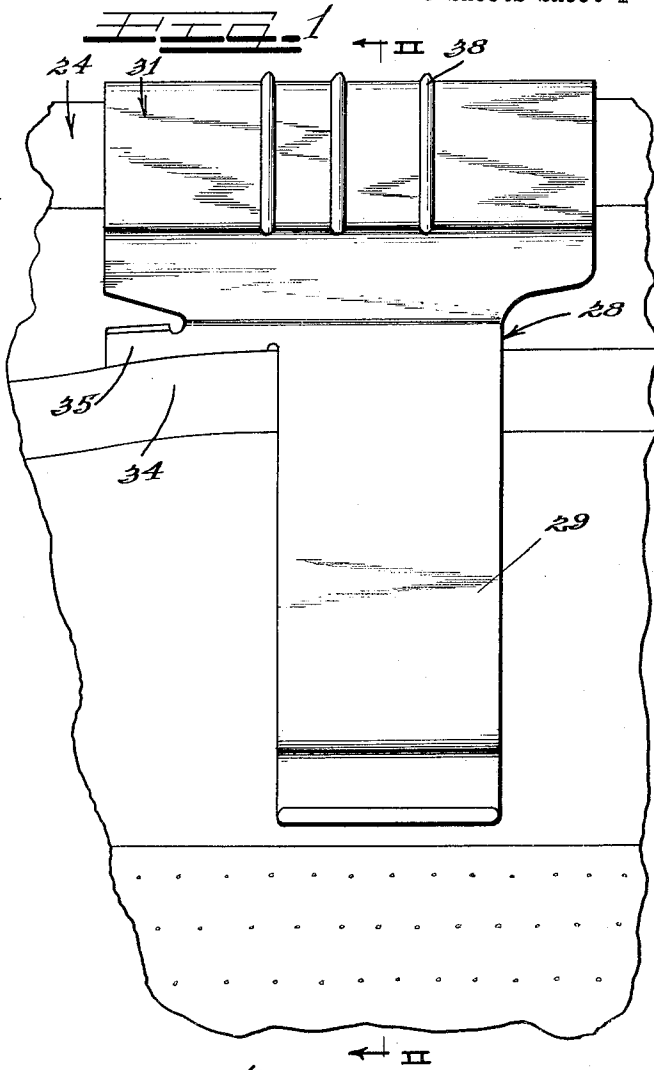
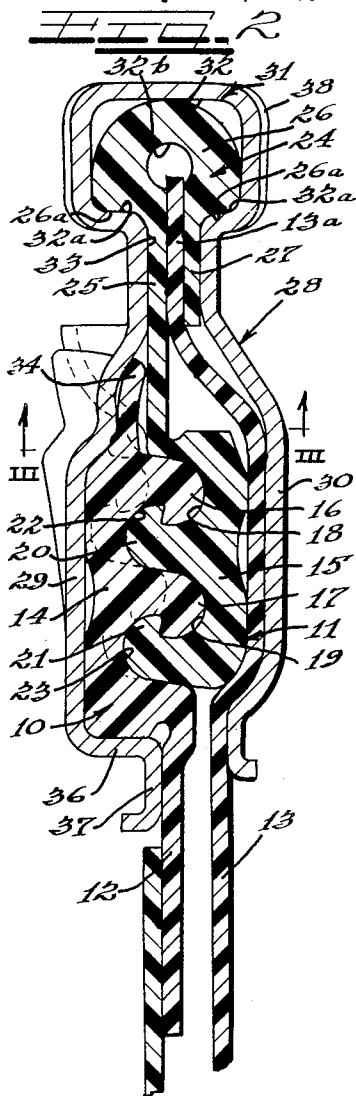
S. AUSNIT ET AL

3,220,076

SLIDE FASTENER

Filed Sept. 20, 1963

5 Sheets-Sheet 1



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SLIDE FASTENER

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FIG. 4

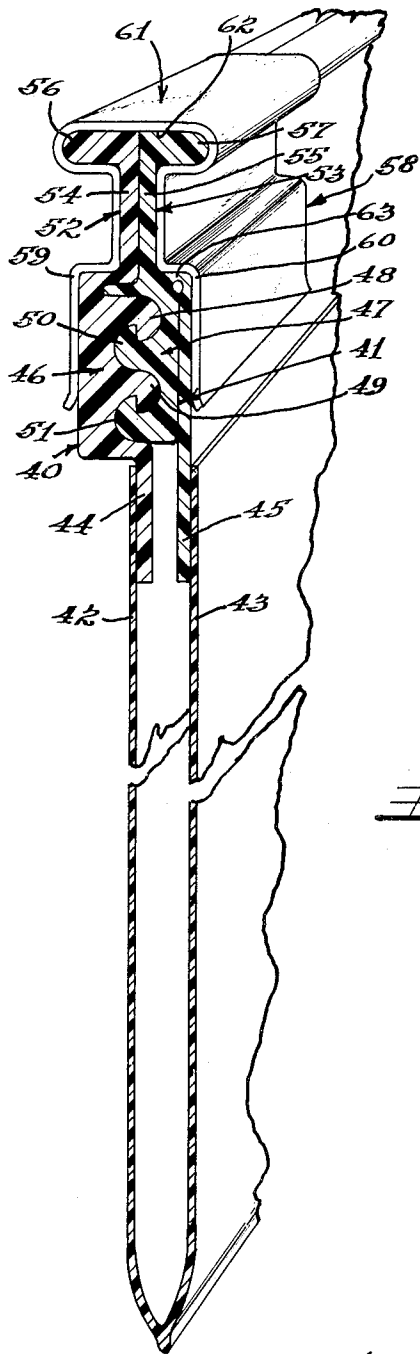


FIG. 5

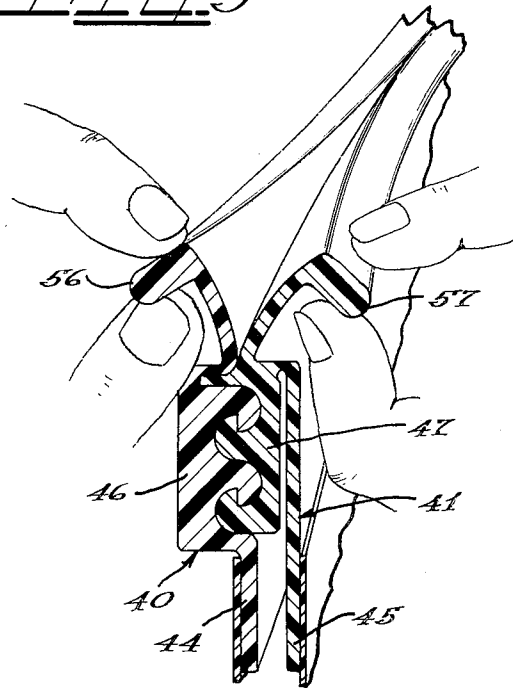
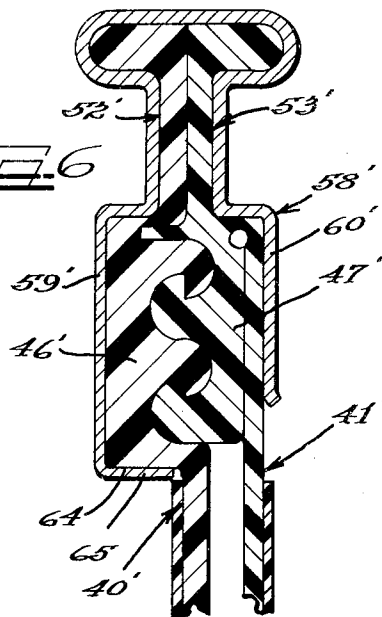


FIG. 6



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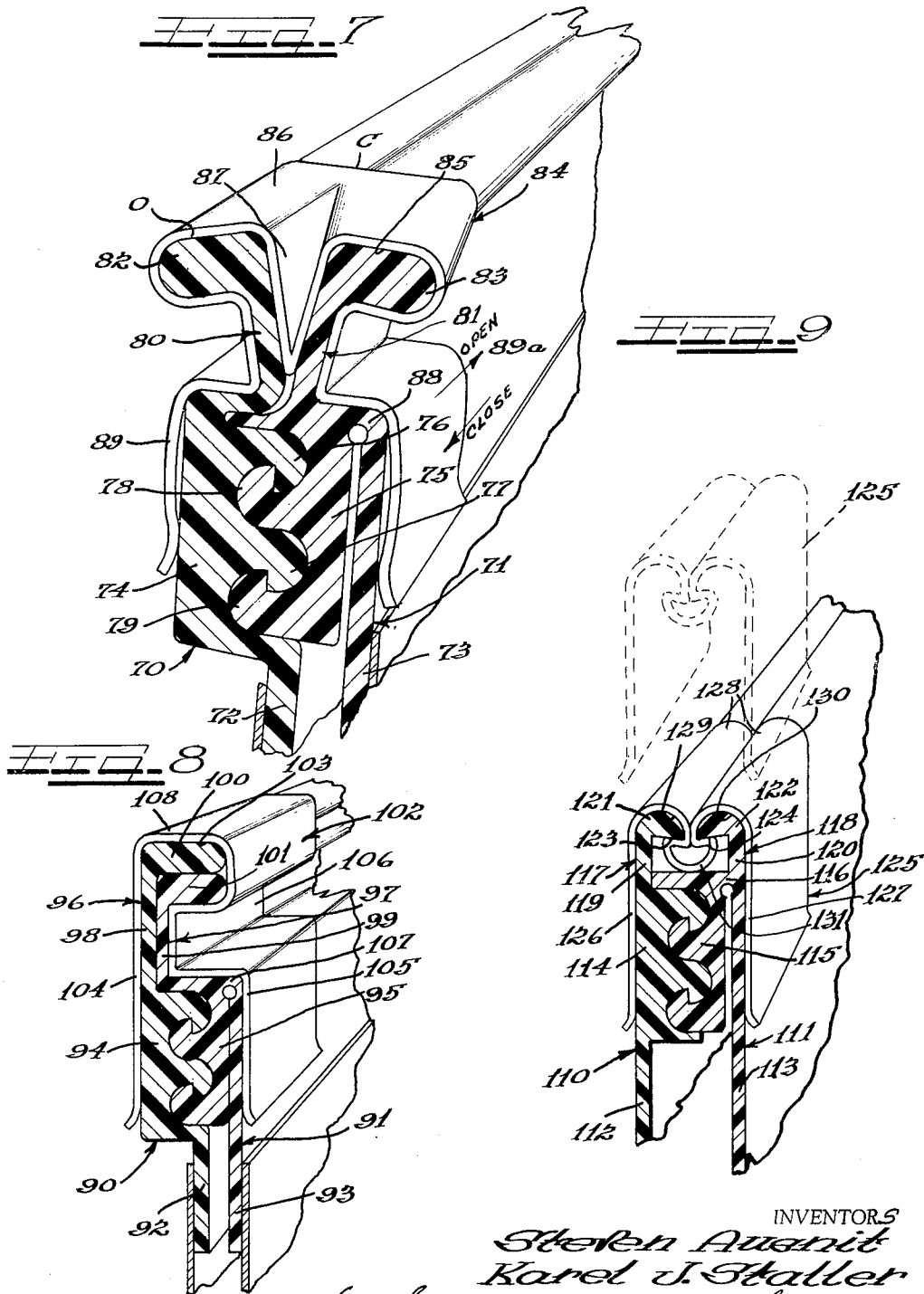
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SLIDE FASTENER

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5 Sheets-Sheet 3



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SLIDE FASTENER

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FIG. 10

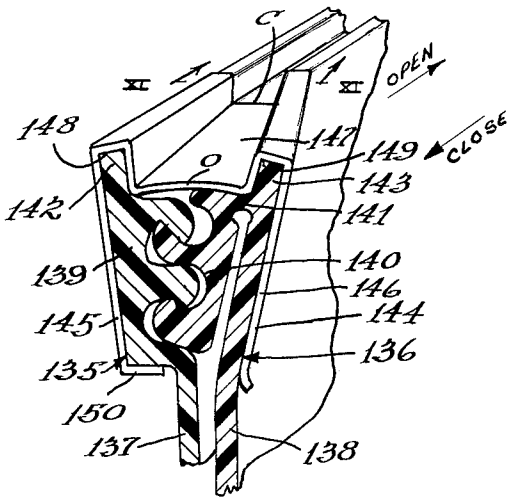


FIG. 11

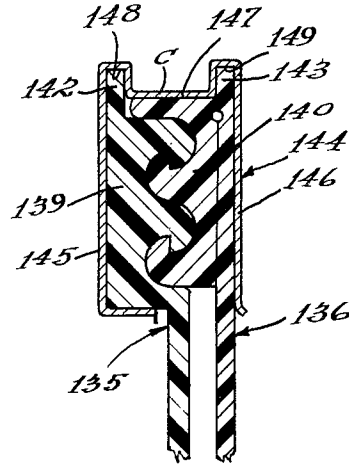


FIG. 12

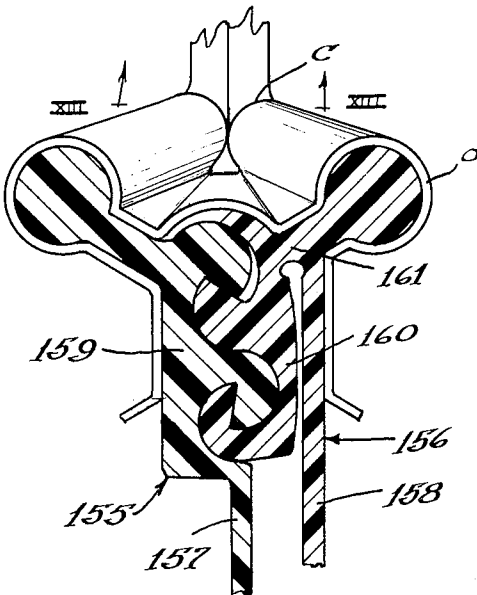
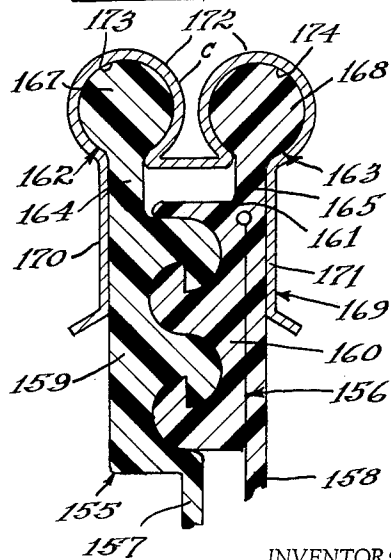


FIG. 13



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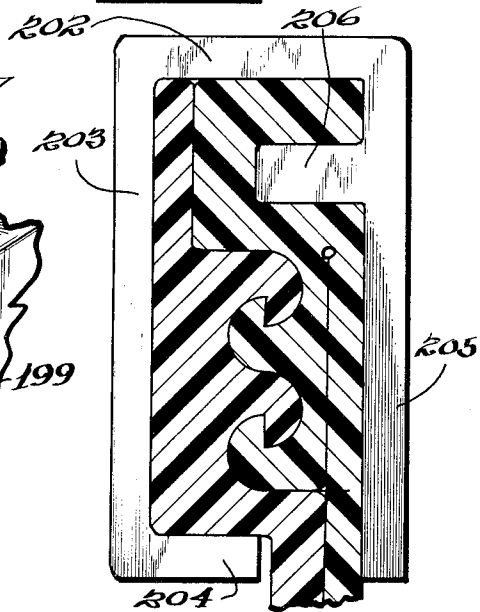
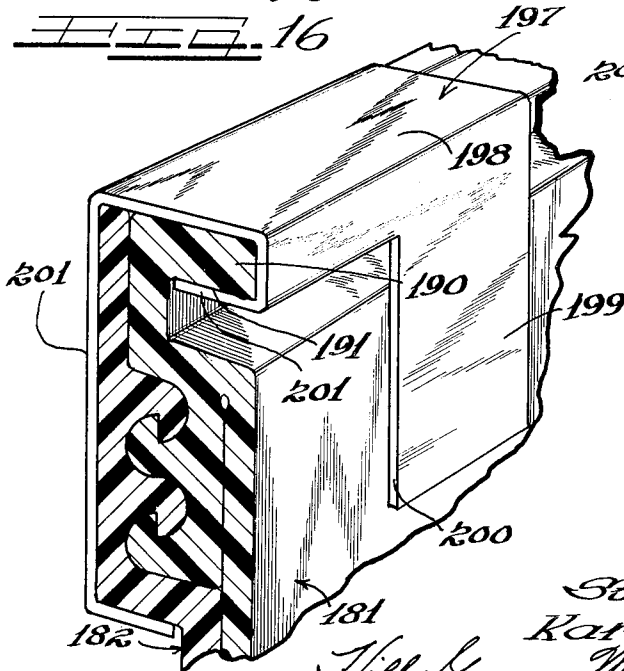
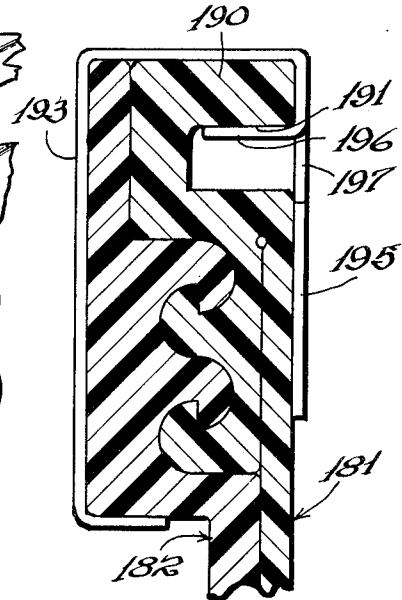
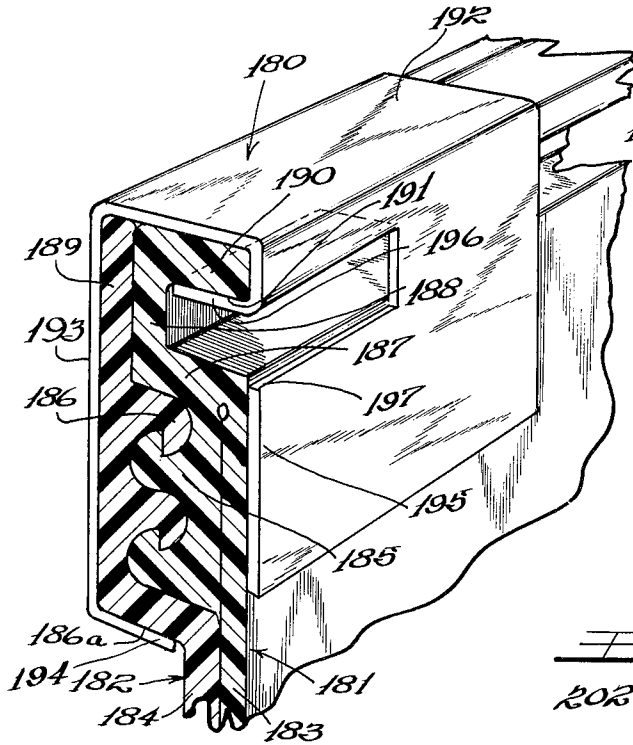
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SLIDE FASTENER

Filed Sept. 20, 1963

5 Sheets-Sheet 5



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3,220,076

SLIDE FASTENER

Steven Ausnit, New York, N.Y., and Karel J. Staller, Rutherford, N.J., assignors to Flexigrip, Inc., New York, N.Y., a corporation of New York  
 Filed Sept. 20, 1963, Ser. No. 310,273  
 5 Claims. (Cl. 24—201)

The present invention relates to improvements in flexible closures of the type having reclosable fastener strips for attachment to the top of bags and the like.

More particularly the invention contemplates providing opposed flexible closure strips in facing relationship having adjacent parallel web portions extending downwardly at the lower edges of the strips and having marginal portions at the upper edges of the strips with releasably interlocking rib and groove elements extending therealong being joined by the application of laterally inwardly directed closing forces and being separated by the application of opening forces drawing the marginal portions outwardly and apart. A slider is provided which straddles the upper edges of the strips and is movable therealong. The marginal portions are provided with flanges at their upper edges and the flanges are utilized for applying closing forces to the strips, for holding the slider in its straddling position on the strips, and in some arrangements for applying opening or partial opening forces to the strips.

It is accordingly an object of the present invention to provide an improved fastener that opens and closes quickly and easily and is water tight.

Another object is to provide a flexible pressure interlocking fastener which is opened manually pulling outwardly on a flange but which is closed by a slider to avoid the tedious difficult act of closing with the fingers.

A further object of the invention is to provide flexible closure strips with an improved slider of a simplified stamped metal construction which is retained in its sliding position straddling the strips by lugs or beads on the opening flanges.

A still further object of the invention is to provide flexible closure strips with flanges and a slider wherein the slider allows partial separation of the opening flanges to make the opening of the fastener easier but without actually separating the strips.

Yet another object of the invention is to provide an improved slider of the type above described with fastener strips wherein the slider can be removed and replaced from the strips.

A still further object of the invention is to provide improved fastener strips of the type having web portions and interlocking marginal portions wherein one of the web portions is attached to its marginal portion by a flexible hinge at or near the upper edge of the marginal portion and wherein the strips are provided with flanges for aiding in opening the hinged fastener and a slider for closing the fastener so that the slider can be of optimum design without embodying features necessary for separating the fastener strips, thereby making the closing operation of the fastener much easier.

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

FIGURE 1 is a fragmentary side elevational view of a closure strip assembly with a slider embodying the principles of the present invention;

FIGURE 2 is a vertical sectional view taken substantially along line II—II of FIGURE 1;

FIGURE 3 is a horizontal sectional view taken substantially along line III—III of FIGURE 2;

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FIGURE 4 is a perspective view with portions in section of a closure strip and slider assembly embodying principles of the present invention;

FIGURE 5 is a perspective view shown with parts in section of a pair of closure strips such as shown in FIGURE 4, illustrating manual opening of the strips;

FIGURE 6 is a vertical sectional view illustrating a modified form of the slider of FIGURE 4;

FIGURES 7 through 10 are perspective views with parts in section of different forms of the invention;

FIGURE 11 is a sectional view taken along lines XI—XI of FIGURE 10;

FIGURE 12 is a vertical sectional view taken through strips of another form;

FIGURE 13 is a vertical sectional view taken substantially along line XIII—XIII of FIGURE 12;

FIGURE 14 is a perspective view illustrating another form of the invention;

FIGURE 15 is an end elevational view of the structure of FIGURE 14;

FIGURE 16 is a fragmentary perspective view illustrating a further form of the invention; and

FIGURE 17 is an end elevational view showing still another form of the invention.

On the drawings:

As shown in FIGURES 1 through 3, a closure assembly for attaching to the top of a bag, pouch or the like is shown having opposed flexible closure strips 10 and 11 formed of plastics such as vinyl or polyethylene of the types which will be fully appreciated by those versed in the art. The strips have web portions 12 and 25, which extend respectively downwardly and upwardly from the marginal portions 14 and 15, for attachment to sheets or walls such as the top of the bag.

The marginal portion 15, is attached to its web portion 25, with the web portion forming at its other end, a bead 24, for retaining the slider 28. Projecting downwardly from the bead 24, and parallel to the web 25, is a flap wall 27. The wall 13 of the bag is attached to the closure assembly by being seated between the web 25, and the flap wall 27.

The marginal portions have interlocking rib and groove elements as illustrated by the upper rib 16 and lower rib 17 of the marginal portion 14 which are received by grooves 18 and 19 in the marginal portion 15, and having generally the same shape as the ribs. The marginal portion 15 has similar ribs 20 and 21 received by grooves 22 and 23 in the marginal portion 14. The ribs and grooves are each of generally the same shape to interlock when lateral inwardly directed forces are applied to the marginal portions 14 and 15. The ribs and grooves will be forcibly separated when they are pulled apart such as by manually applying separating or opening forces to the upper edges of the marginal portions 14 and 15 pulling the ribs out of the grooves.

Above the marginal portions 14 and 15 is the flange 24. In the structures of FIGURES 1 through 3 the flange includes a wall 25 extending upwardly from the marginal portion 15. At the top of the wall is a bead 26 which has a downwardly extending lip 27. The upper edge 13a of the bag wall 13 is secured between the wall 25 and the lip 27 such as by heat sealing or by a suitable adhesive or cement.

The bead 26 has downwardly facing shoulders 26a at its sides which ride on upwardly facing surfaces 32a on the slider 28 so as to help retain the slider in its position straddling the strips 10 and 11. The bead is also shaped with a circular hollow portion 32b at its center where it receives the upper edge 13a of the bag wall portion 13.

The slider 28 has downwardly extending sides 29 and 30 which are substantially parallel to each other and are

spaced apart so that they force the marginal portions together when the slider is moved along the strips in a closing direction, which is to the left as shown in FIGURES 1 and 3.

The sides 29 and 30 of the slider are interconnected and rigidly supported by a slider back 31 which is shaped to form a channel 32 therein. This channel has a throat portion 33 which receives the wall 25 and upper end 13a of the bag wall, and has an enlarged upper portion which slidingly receives the bead 26 and is generally shaped to conform to the shape of the bead 26.

Projecting downwardly from the back 31 is a separating finger 35 which is at one side of the back and in front of the slider side 29. The side 29 is shorter than the length of the back 31. The finger 35 is generally cam shaped to cam outwardly a separating lip 34. The lip is attached to or is integral with the marginal portion 14 and when drawn outwardly will separate the marginal portions pulling the ribs from the grooves.

When the slider 28 is moved in its opening direction (to the right as shown in FIGURES 1 and 3) the finger 35 cams the lip 34 outwardly applying an opening force and drawing the strips apart to the dotted line position illustrated in FIGURE 2. If desired the lip 35 may be shaped so that it applies an opening force sufficient to disengage the upper ribs and grooves 16 and 18 and 20 and 22, or a force sufficient only to cause the lip 34 to stand outwardly so that it may be easily gripped manually and the opening of the strips can be completed, without disturbing the lock and thereby still keeping it watertight. The separating lip 34 also acts to prevent the slider from being pulled off the ends of the fastener strips.

At the lower edge of the side 29 of the slider, the material is turned under in a flange 36 and then turned down in a flange 37, with the flange 36 riding beneath a shoulder under the marginal portion 14 to aid in holding the slider on the strips, and with the flange 37 aiding in guiding the slider.

Across the back 31 are raised ridges 38 which aid in gripping the slider to move it manually in an opening or in a closing direction.

FIGURES 4 and 5 show another arrangement wherein closure strips 40 and 41 are secured at the top edges of side walls 42 and 43 of a bag. The bag and strips may be of a plastic material whereby a heat seal can easily be formed to join web portions 44 and 45 to the bag walls 42 and 43.

The strips of marginal portions 46 and 47 are generally above the web portions with the marginal portion 46 attached to the upper edge of its web portion and the marginal portion 47 positioned alongside of its web portion 45 and attached thereto by a hinge portion 63.

The marginal portions have interlocking rib and groove elements as illustrated by the ribs 48 and 49 for the marginal portion 46 and the ribs 50 and 51 for the marginal portion 47. The grooves are formed between the ribs and are of a substantially complementary shape so as to lockingly hold the ribs when the ribs are pressed into the grooves by the application of inwardly directed closing forces.

At the upper edges of the marginal portions are shaped flanges 52 and 53 with the flanges having an upwardly extending wall 54 or wall 55 with lugs or beads 56 and 57 at the upper edge of the walls 54 and 55. The lugs 56 and 57 project outwardly with the walls 54 and 55 in surface-to-surface confronting relationship when the strips are interlocked.

Mounted over the strips and straddling them is a slider 58 having sides 59 and 60 which are parallel to each other and are spaced so as to apply a closing force to the marginal portions 46 and 47.

While strips of the type shown in FIGURE 4 can be closed by applying pressure with a finger, with very long strips this becomes tiresome and difficult to do. Accordingly the slider 58 is provided for a closing function only.

By sliding the slider 58 along the strips in either direction when they are separated, the slider will press them together to close them. The strips can easily be separated manually without the slider by gripping the lugs or beads 56 and 57 in the manner shown in FIGURE 5 and drawing them outwardly. This can readily be done and for long strips the entire strips can be rapidly separated by an outward pull and in many cases this will be easier than utilizing a slider for the opening function. Thus a combination will have been provided wherein a slider performs the closing function only since this is more easily accomplished by a slider, and the opening function is done manually since this is more rapidly and easily done with the fingers. This also simplifies the structure of the slider and makes it possible to design it for optimum efficiency for closing and it will close when moved in either direction, so that in closing it can be moved to one end of the strips, and when the strips are separated they will again be joined by moving the slider to the other end of the strips.

The present arrangement provides a fastener that combines the features of a conventional slider and a sliderless closure and yet avoids the disadvantages thereof. The closure is waterproof and quick to open by pulling apart the flanges, yet it is easy and quick to close by using the slider. The hardness or difficulty of opening that is usually associated with a conventional slider has been eliminated, and by eliminating this it is possible to improve the strength in the lock of the fastener (the stronger the lock the more difficult it is to disengage by a conventional slider—the type of fastener lock illustrated will engage easier than it will disengage).

In addition to the foregoing advantages, it is simpler and easier to manufacture the slider of the present invention and less expensive. The slider can actually be pulled right off the end of the fastener unless means are provided to keep it in place. Such means would be either in the form of a lip, not shown, or a special end stop at either end of the fastener. Such an end stop might be made after the bag is manufactured. This might appear to be a disadvantage inasmuch as it would involve an extra operation, but the above operation makes it possible to put on the slider after the whole bag is made. This makes it easier and quicker to produce the bag allowing for a continuous flow of material instead of having to interrupt the operation to put on a slider.

The slider 58 is formed of a unitary sheet of material such as sheet metal of a substantially uniform thickness and a rectangular strip of metal can form the slider 58 by merely shaping the strip to the shape illustrated. The sides 59 and 60 of the slider have a connecting back 61 which supports them and in the back is formed a channel 62 which is shaped to conform to the shape of the flanges 52 and 53. The lower edges of the sides 59 and 60 may be turned slightly outwardly to avoid binding or cutting into the outer surfaces of the strips.

FIGURE 6 illustrates an assembly substantially similar to that shown in FIGURES 4 and 5 but the sliders is modified to provide an additional means for holding it on the strips. Elements which correspond to the elements of FIGURES 5 and 4 are similarly numbered, and FIGURE 6 illustrates strips 40' and 41' having marginal portions 46' and 47' with upper shaped flanges 52' and 53'. A slider 58' has sides 59' and 60' and the side 59' extends down to the lower edge of the marginal portion 46' and is turned inwardly to form a retaining flange 65 which slides beneath a shoulder 64 on the underside of the marginal portion 46'.

FIGURE 7 illustrates a modified form of slider used with strips such as that illustrated in FIGURES 4 through 6. Strips 70 and 71 are provided with web portions 72 and 73 and marginal portions 74 and 75 generally above the web portions and integral therewith. The marginal portion 74 has upper and lower rib elements 76 and 77 and the marginal portion 75 has upper and lower rib elements

78 and 79, and the rib elements have grooves therebetween with a shape substantially corresponding to the rib elements so that the rib elements will interlock therein. In each of the arrangements illustrated throughout the various figures of the drawings, the rib elements are shown having a general hook shape with overhanging sides to provide inwardly facing surfaces; while this is a preferred form other types of interlocking rib and groove elements may be employed as will be appreciated by those versed in the art. The hook shape of the ribs is arranged such that the hooks of the marginal portion 75 extend upwardly toward the hinge 88 which attaches the marginal portion to its web portion 73. This will cause the hooks to extend in a direction of their greatest strength, and to resist separation when stresses are put on the bag walls to draw the marginal portions 72 and 73 away from each other in which condition the interlocked marginal portions will tend to align or pull along a straight line with the web portions.

At the upper edges of the marginal portions 74 and 75 are shaped flanges 80 and 81 having lugs 82 and 83 at their upper edges with the flanges having inner planar surfaces facing each other.

A slider 84 straddles the strips and has sides 89 and 89a which ride along the outer surfaces of the strips. The sides are supported on an integral back 86 having a channel 85 therein. The channel is shaped to receive the flanges 80 and 81 and at a closing end C of the slider the channel is of a size so as to hold the flanges 80 and 81 together to thereby apply a closing force when the slider is moved in a closing direction. This would be the direction where the slider was moved toward the viewer in FIGURE 7.

At the other end of the channel 85 the back 86 is shaped with a central separator finger 87 formed by forcing the material of the back downwardly in a V shape. The edges of the channel 85 are similarly spaced further apart so as to draw the flanges 80 and 81 apart and apply an opening force to the strips. The slider can be made so that the flanges are pulled apart sufficiently to partially disengage the strips such as by withdrawing the upper ribs 76 and 78 from their grooves. This will occur when the slider 84 is moved in an opening direction which is generally away from the viewer in FIGURE 7. With the strips partially disengaged the flanges will remain in a separated position so that the operator can easily insert his finger between the flanges 80 and 81 and draw them apart to complete the opening of the strips. To accommodate the partial separation of the strips the sides 89 and 89a of the slider at the opening end O may be separated a distance greater than at the closing end C so that the marginal portions can also be separated as illustrated in FIGURE 7.

With this construction of the slider for partially opening the strips a small lightweight slider can be employed which is particularly effective for closing the strips and yet which adequately disengages the strips from each other so that separation may be easily completed.

In the structure shown in FIGURE 8, closure strips 90 and 91 have web portions 92 and 93, and a marginal portion 94 is mounted above the web portion 92, and a marginal portion 95 is mounted generally above its web portion 93 but lying alongside of it and attached thereto by a hinge portion 107 at the upper end of the web portion. The marginal portions have ribs and grooves of the type heretofore described which interlock when the strips are pressed together and which separate when a laterally outwardly directed opening force is applied.

At the upper edges of the marginal portions are shaped flanges 96 and 97 of unique design. The flanges have wall portions 98 and 99 with beads 100 and 101 at the upper edge. The wall portion 98 extends directly upwardly from its marginal portion in alignment with its outer surface. The wall portion 99 is offset to the innermost edge of the marginal portion 95 so that its surface

lies in planar surface-to-surface engagement with the surface of the wall portion 98.

The lugs or beads 100 and 101 extend in the same lateral direction over the top of the strips with the bead 100 being above the bead 101.

A slider 102 straddles the strips 90 and 91 and has sides 104 and 105 spaced from each other so that they will apply an inwardly directed closing force to the strips when moved in either direction. The sides are supported on a rigid back 108 which is formed with a channel 103 therein. The channel is shaped to accommodate the shaped flanges 96 and 97 and is formed so that the side 104 extends in a flat plane completely to the top of the slider, and the side 105 is offset inwardly at 106. With this arrangement the slider is firmly held on the strips and a closing force is applied to the strips by both the sides 104 and 105 by the channel 103.

In the structure of FIGURE 9 the strips and slider are constructed so that the slider may be taken off of the strips by forcibly drawing it upwardly. Strips 110 and 111 have web portions 112 and 113 and marginal portions 114 and 116. The marginal portion 114 is mounted above its web portion 112 and the marginal portion 115 extends generally above its web portion 113 and lies alongside the upper edge thereof being attached thereto by a hinge 116.

The strips have shaped flanges 117 and 118 at their upper edges with the shaped flange 117 having a wall 109 extending upwardly above the marginal portion 114 and having a bead 121 at the upper edge of the wall. The bead is constructed so as to extend laterally inwardly forming a downwardly facing shoulder 123.

The strip 111 has its shaped flange 118 with a wall 120 extending upwardly from the outer edge of the marginal portion 115 and substantially from the hinge 116. Above the wall 120 is a bead 122 which extends laterally inwardly toward the bead 121 and has a downwardly facing overhanging shoulder 124.

A slider 125 straddles the upper edges of the strips and has sides 126 and 127 spaced apart to provide a closing force for joining the strips when the slider is moved therealong. The sides 126 and 127 are rigidly supported and spaced on a back 128 which has channel means therein, formed with a first channel portion 129 and a second channel portion 130 and the channel portions spaced and shaped so as to accommodate the two flanges 117 and 118. The back 128 is bent downwardly in a central finger which is enlarged to form a bulbous end 131 having upwardly facing shoulders slidingly engaging the shoulders 123 and 124 of the beads. This will hold the slider in place on the strips during normal operation.

However, the slider 125 can be removed by pulling it upwardly to the dotted line position of FIGURE 9. When a strong force is applied to pull the slider upwardly the flanges will yield by the beads bending upwardly and sliding through the spaces outwardly of the end 131 of the finger. The slider can also be removed by pulling it across the ends of the fastener unless means have been provided to prevent this.

FIGURE 10 illustrates closure strips 135 and 136 having web portions 137 and 138. Web portion 137 has a marginal portion 139 at its upper edge, and web portion 138 has a marginal portion 140 at its upper edge attached thereto by a hinge portion 141. The marginal portions have interlocking rib and groove elements extending therealong of the type previously described.

At the upper edges of the marginal portions are flanges 142 and 143 which are generally rectangular in shape.

Mounted on the strips and straddling them is a slider 144. The slider is formed of a rigid material such as sheet metal and has sides 145 and 146. The sides are spaced so as to apply a laterally inwardly directed clos-



ing force to the strips at a closing end C of the slider, as illustrated in FIGURE 11.

The sides 145 and 146 diverge toward an opening end O of the slider to permit at least the upper ribs and grooves of the marginal portions 139 and 140 to separate.

The sides of the slider are rigidly supported on an interconnecting back 147 which has channel means therein with first and second channel portions 148 and 149 shaped to conform to the rectangular shape of the flanges 142 and 143. The channels converge toward the closing end C of the slider so as to apply a closing force to the strips with the position of the channels at the closing end being shown in FIGURE 11.

At the opening end O of the slider the channels diverge to be spaced apart as shown in FIGURE 10, and they apply an opening force to the inner side surfaces of the flanges 142 and 143 to separate the upper edges of the strips.

As indicated by the arrowed lines in FIGURE 10, when the slider is moved in a closing direction the strips will be joined, and when the slider is moved in an opening direction the strips will be separated, at least in part, and the completion of the separation can be readily accomplished manually by the operator simply gripping the flanges 142 and 143.

For holding the slider on the strips the side 145 is turned inwardly at its lower edge in an underhanging lip 150 which rides beneath a shoulder under the marginal portion 139, and the marginal portion is laterally offset from its web portion 137 for this purpose.

FIGURES 12 and 13 illustrate closure strips 155 and 156 with web portions 157 and 158. The web portion 157 has a marginal portion 159 integral with its upper edge. The web portion 158 has a marginal portion 160 generally above it and lying alongside of its upper edge and attached thereto by a hinge portion 161. The marginal portions have interlocking rib and groove elements extending therealong of the type heretofore described.

At the upper edges of the marginal portions are shaped flanges 162 and 163. Each of the flanges has a wall portion 164 and 165 and at the upper edges of the walls are generally cylindrically shaped beads 167 and 168.

Mounted on the strips is a slider 169 with sides 170 and 171. The sides are spaced at a closing end C of the slider to apply a closing force thereto aided by closing forces applied to the shaped flanges 162 and 163. The sides are rigidly supported on a back 172 for the slider which has channel means formed therein with a first channel portion 173 and a second channel portion 174.

The channel portions are shaped to conform to the shape of the flanges 162 and 163. At the closing end C of the slider the channel portions converge so as to apply a closing force to the strips. At the opening end O of the slider the channel portions 173 and 174 diverge to apply an opening force to the strips 155 and 156. The sides 170 and 171 are tapered generally downwardly and the back of the slide tapers downwardly so as to accommodate the flanges bending somewhat downwardly when they are pulled apart due to the shape of the channel portions 173 and 174.

When the slider 169 is moved in a closing direction (which is toward the viewer in FIGURE 12) the strips are pressed together to close them. When the slider is moved in an opening direction (which is away from the viewer in FIGURE 12) the strips are partially separated by applying a separating force to the flanges separating at least the upper rib and groove elements so that the completion of the separation may be readily accomplished. The strips will have become sufficiently detached so that they can be separated by manually pulling apart on the shaped flanges 162 and 163, or by running a finger down along between the strips or by pulling apart on the web portions 157 and 158.

Thus it will be seen that I have provided an improved

flexible closure strip assembly which meets the objectives and advantages above set forth. The slider operates on flanges for applying forces to the strips and the flanges retain the slider on the strips. Also the slider can be removed from the strips and replaced.

In the structure of FIGURES 14 and 15, a pair of closure strips 181 and 182 have web portions 183 and 184 respectively, with their marginal portions 185 and 186 thereon. The marginal portions have the usual pressure interlocking rib and groove elements which need not be described in detail. The marginal portion 186 is laterally outwardly offset from its web portion 184 to provide a downwardly facing shoulder 186a. The marginal portion 185 is positioned beside its web portion 183 being attached thereto integrally at its upper edge by a hinge portion 187.

Above the marginal portions 185 and 186 are flanges 188 and 189. The flange 188 is a laterally outwardly extending bead 190 which provides a downwardly facing shoulder 191.

A closing slider 180 is mounted on the strips being formed of one piece such as shaped metal, and the slider 180 has a back 192 with integrally downwardly extending sides 193 and 195. The side 193 has an returned lip 194 at its lower edge to ride beneath the shoulder 196a.

The side 195 extends parallel to the strips and parallel to the side 193 and a tab or plate 196 is cut from the side and bent inwardly and upwardly to extend inwardly at right angles to the wall 195, leaving a slot 197. The tab rides beneath the shoulder 191 guiding and stabilizing the slider 180 inasmuch as the bead 190 is bracketed in the channel formed between the tab 196 on the back 192 of the slider.

In the arrangement of FIGURE 16 the slider is in some respect similar to the slider of FIGURE 14, except that the side wall is cut away beneath the tab. In the structure of FIGURE 16, the strips 181 and 182 receive a slider 197 having a back 198 and sides 199 and 201. The side 199 is cut back at 200 and a tab or plate 201 is formed and bent inwardly to project beneath the shoulder 191 of the bead 190 of the strips.

FIGURE 17 illustrates a molded slider formed in one piece of a substantially rigid thermoplastic or hard rubber or like material. The fastener is uniform in configuration from end to end so that it can be formed in a continuous extruded strip with ends being cut off the strip to form the individual sliders. The sliders can also be individually molded. The slider has a back 202 with downwardly extending sides 203 and 205. The back 203 has an returned lip 204 at the lower edge for sliding beneath a shoulder on the strips, and the slider will be used on strips such as that shown in FIGURE 14. A tab or plate 206 projects inwardly from the inner surface of the wall 205.

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 modification, changes and alternative constructions and methods falling within the scope of the principles taught by the invention.

We claim as our invention:

1. A flexible closure comprising in combination, opposed flexible closure strips in facing relationship having adjacent parallel web portions extending downwardly at the lower edge of the strips, and having marginal portions generally above the web portions with releasably interlocking continuous rib and groove elements extending therealong being joined by the application of laterally inwardly directed closing forces and being separated by the application of opening forces drawing the marginal portions outwardly apart, a slider straddling the upper edge of the strips and movable therealong,

said rib element being thicker than overhanging sides of the groove element to positively interlock the rib element therein requiring force for separation,

said slider having lateral sides for sliding along the outer surfaces of said strips for applying the closing forces and having a back rigidly supporting and extending between said sides,

upwardly projecting flexible outwardly bendable flanges on the upper edges of said marginal portions, a finger gripping edge at the top of each of the flexible flanges with at least one of the edges having a downwardly facing continuous slider retaining surface, and a channel in said slider back having a shape conforming to the shape of said projecting flanges and to said gripping edges and having an upwardly facing surface riding beneath said slider retaining surface,

said slider sides forming a tunnel in the region of the marginal portions, said tunnel being unobstructed inside and beyond the slide so that only the outer surfaces of the marginal portions are engaged by the slider.

2. A flexible closure comprising in combination, opposed flexible closure strips in facing relationship having adjacent parallel web portions extending downwardly at the lower edge of the strips, and having marginal portions generally above the web portions with releasably interlocking continuous rib and groove elements extending therealong being joined by the application of laterally inwardly directed closing forces and being separated by the application of opening forces drawing the marginal portions outwardly apart,

a slider straddling the upper edge of the strips and movable therealong,

said rib element being thicker than overhanging sides of the groove element to positively interlock the rib element therein requiring force for separation,

said slider having lateral sides for sliding along the outer surfaces of said strips for applying the closing forces and having a back rigidly supporting and extending between said sides,

upwardly projecting flexible outwardly bendable flanges on the upper edges of said marginal portions being thinner than the marginal portions,

a finger gripping edge bead extending laterally outwardly at the top of each of the flexible flanges with the beads each having downwardly facing continuous slider retaining surfaces,

and a channel in the slider back having a shape conforming to the shape of said projecting flanges and to said beads and having upwardly facing surfaces riding beneath the beads,

said slider sides forming a tunnel in the region of the marginal portions,

said tunnel being unobstructed inside and beyond the slider so that only the outer surfaces of the marginal portions are engaged by the slider.

3. A flexible closure comprising in combination, opposed flexible closure strips in facing relationship having adjacent parallel web portions extending downwardly at the lower edge of the strips, and having marginal portions generally above the web portions with releasably interlocking continuous rib and groove elements extending therealong being joined by the application of laterally inwardly directed closing forces and being separated by the application of opening forces drawing the marginal portions outwardly apart,

a slider straddling the upper edge of the strips and movable therealong,

said rib element being thicker than overhanging sides of the groove element to positively inter-

lock the rib element therein requiring force for separation,

said slider having lateral sides for sliding along the outer surfaces of said strips for applying the closing forces and having a back rigidly supporting and extending between said sides,

upwardly projecting flexible outwardly bendable flanges on the upper edges of said marginal portions, a finger gripping edge at the top of each of the flexible flanges with at least one of the edges having a downwardly facing continuous slider retaining surface, a channel in said slider back having a shape conforming to the shape of said projecting flanges and to said gripping edges and having an upwardly facing surface riding beneath said slider retaining surface,

said slider sides forming a tunnel in the region of the marginal portions, said tunnel being unobstructed inside and beyond the slider so that only the outer surfaces of the marginal portions are engaged by the slider,

and a short downwardly extending projection on the back projecting downwardly only between said flanges so that said tunnel remains unobstructed in the region of the marginal portions and said projection separates only said outwardly bendable flanges.

4. A flexible closure comprising in combination, opposed flexible closure strips in facing relationship having adjacent parallel web portions extending downwardly at the lower edge of the strips, and having marginal portions generally above the web portions with releasably interlocking continuous rib and groove elements extending therealong being joined by the application of laterally inwardly directed closing forces and being separated by the application of opening forces drawing the marginal portions outwardly apart,

a slider straddling the upper edge of the strips and movable therealong,

said rib element being thicker than overhanging sides of the groove element to positively interlock the rib element therein requiring force for separation,

said slider having lateral sides for sliding along the outer surfaces of said strips for applying the closing forces and having a back rigidly supporting and extending between said sides,

upwardly projecting flexible outwardly bendable flanges on the upper edges of said marginal portions, a finger gripping edge at the top of each of the flexible flanges with at least one of the edges having a downwardly facing continuous slider retaining surface,

and a channel in said slider back having a shape conforming to the shape of said flanges with a tab extending inwardly from one of said sides riding beneath said slider retaining surface,

said slider sides forming a tunnel in the region of the marginal portions,

said tunnel being unobstructed inside and beyond the slider so that only the outer surfaces of the marginal portions are engaged by the slider.

5. A flexible closure comprising in combination, opposed flexible closure strips in facing relationship having adjacent parallel web portions extending downwardly at the lower edge of the strips, and having marginal portions generally above the web portions with releasably interlocking continuous rib and groove elements extending therealong being joined by the application of laterally inwardly directed closing forces and being separated by the application of opening forces drawing the marginal portions outwardly apart,

a slider straddling the upper edge of the strips and movable therealong,

said rib element being thicker than overhanging

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sides of the groove element to positively interlock the rib element therein requiring force for separation,  
 said slider having lateral sides for sliding along the outer surfaces of said strips for applying the closing forces and having a back rigidly supporting and extending between said sides, 5  
 upwardly projecting flexible outwardly bendable flanges on the upper edges of said marginal portions, finger gripping bead edges at the top of each of the flexible flanges extending inwardly toward each other with the edges having downwardly facing continuous slider retaining surfaces, 10  
 and a channel in the slider back having a shape conforming to the shape of said projecting flanges and to said edges and having upwardly facing surfaces riding beneath said slider retaining surfaces held by a portion of the back extending between said edges, said slider sides forming a tunnel in the region of the marginal portions, 15  
 said tunnel being unobstructed inside and beyond 20

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the slider so that only the outer surfaces of the marginal portions are engaged by the slider.

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