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POUCH WITH SLIDERLESS FASTENER CLOSURE

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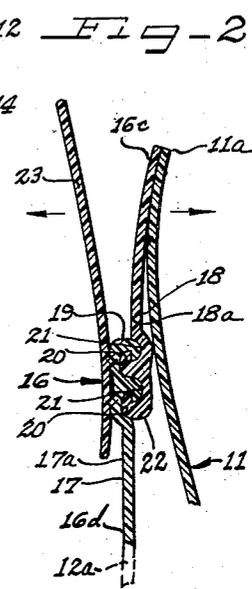
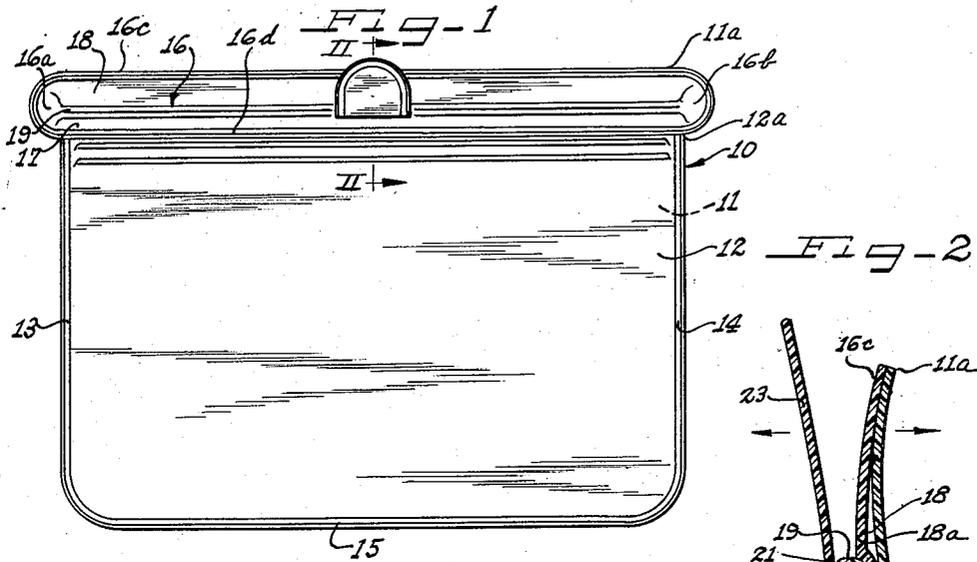


FIG-3

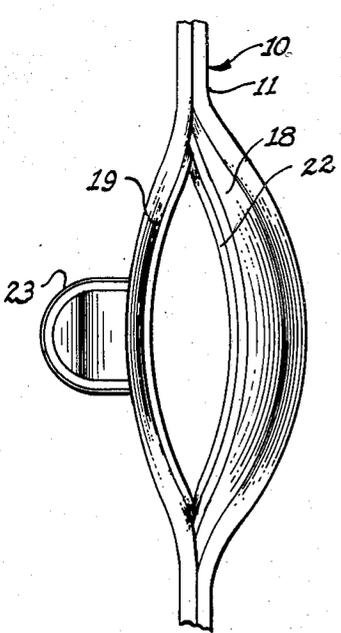
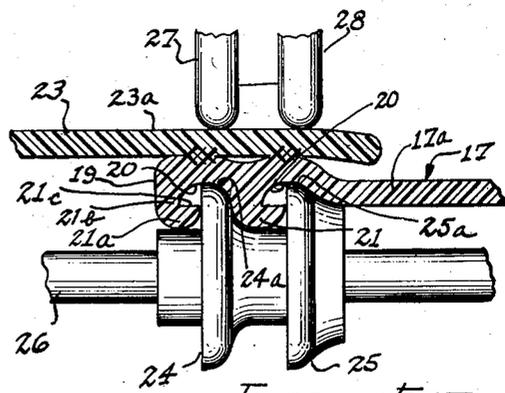


FIG-4



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UNITED STATES PATENT OFFICE

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POUCH WITH SLIDERLESS FASTENER CLOSURE

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3 Claims. (Cl. 150—3)

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My invention relates to a pouch or the like container having a sliderless fastener closure, and more particularly, to a pouch having a fastener or closure arrangement adapted to provide an air-tight seal, and a process of and apparatus for fabricating such closure arrangement.

At the present time, pouches or the like containers are employed for a variety of different purposes, including use as containers for tobacco or the like particulate material which should be kept in a substantially air-tight and moisture proof container, in order to preserve the quality thereof. An obvious disadvantage of many fasteners, including the ordinarily used metallic slide fasteners, is that such fasteners are not adapted to provide an air-tight seal. In addition, such fasteners tend to become clogged or inoperative as a result of collection of particulate material in between the closely spaced metallic projections or teeth. In fact, all slide fasteners employing a slider for effecting opening and closing of such fasteners leave something to be desired in this respect, since the slider ordinarily fits very snugly in the slide fasteners and even a small amount of dirt, dust or the like particulate material may interfere very substantially with the normal reciprocal movement of the slider.

Heretofore, however, the slide fasteners employed in tobacco pouches or the like containers were almost invariably a slider-operated metallic slide fastener, or at least slider-operated slide fasteners of one type or another, since such fasteners appear to be the only type which could be handily opened and closed and which provided sufficient strength when closed.

The instant invention, however, relates to a pouch with a sliderless fastener closure. The instant pouch is provided with a unique type of resilient fastener arrangement, suitably equipped with the necessary means for opening the fastener and for closing the same merely by the use of manual squeezing and pulling forces, even though such a fastener is substantially air-tight when closed and is capable of resisting very great pulling forces applied in the manner ordinarily involved in regular use of the pouch. In particular, my invention provides a tab suitably attached to one strip of a sliderless fastener or closure to provide, in combination with the opposite strip of the closure, means for opening said fastener or closure without using a slider. My invention also consists in an apparatus for and method of affixing such a tab to one of the closure strips.

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It is, therefore, an important object of my invention to provide an improved pouch with a sliderless fastener or closure, an improved sliderless fastener or closure therefor, and an improved apparatus for and method of fabricating such pouch and sliderless fastener or closure.

It is another object of my invention to provide an improved fastener comprising, in combination, two flat strips having overlapping edge portions, a reinforcement in each of said edge portions having two ridges and two grooves arranged substantially normal to the planes of said strips, respectively, said grooves in one of said reinforcements corresponding in shape to said ridges in the other of said reinforcements and vice versa; and a tab secured to the back of one of said reinforcements and extending outwardly therefrom in substantially parallel alignment with the strip mounting the other of said reinforcements, whereby said strips may be fastened to each other by pressure acting substantially normal to the planes of said strips, and said strips may be separated from each other by grasping said tab and the strip parallelly aligned therewith and pulling them apart in directions substantially normal to the planes of said strips.

It is a further object of my invention to provide an improved pouch comprising a pair of superimposed sheet-like wall portions having free edge portions at one side for defining an opening and having engaged edge portions at the remaining sides defining a container, one of said free edge portions extending outwardly at such opening in substantially parallel spaced relationship from the other or inner edge portion; a first flat closure strip engaging the outer free edge portion and extending toward the inner free edge portion; a second flat closure strip engaging the inner free edge portion and extending toward the outer free edge portion to overlap in substantially parallel relationship said first closure strip; a reinforcement in each said strips presenting allochirally mating contiguous faces each having a pair of ridges and a pair of grooves arranged substantially normal to the planes of said strips, respectively, said grooves in one of said reinforcements corresponding in shape to said ridges in the other of said reinforcements and vice versa; and a tab secured to the back of the reinforcement for said second closure strip extending outwardly therefrom in substantially parallel alignment with the first closure strip.

Still another object of my invention is to provide an improved method of affixing a thermoplastic finger tab to one of a pair of allochiral closure strips each having a plurality of grooves

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and a like number of ridges therein arranged substantially normal to the planes of each said strips, that comprises providing rigid supporting surfaces to conform substantially to the bottoms of each such grooves in one of said strips and fitting such supports snugly against said bottoms, positioning the tab against the back of the strip opposite said fitted supports, and applying heat and pressure to the outer surface of the tab at localized points directly opposite said supports to squeeze the strip and tab against said supports until the tab is fused to the strip.

Still a further object of my invention is to provide an improved apparatus for welding a thermoplastic finger tab to one of a pair of allochiral thermoplastic closure strips each having a plurality of grooves and a like number of ridges therein arranged substantially normal to the planes of each said strips, that comprises means defining spaced uniplanar rigid supporting surfaces to conform substantially to the bottoms of each such grooves in one of said strips and heat-sealing electrodes movable in a plane normal to the plane of said surfaces and aligned with each such surfaces to apply heat and pressure to the tab positioned upon a strip which is engaged with said surfaces.

Other objects, features and advantages of my invention will become apparent to those skilled in the art from a consideration of the following disclosure and the attached sheet of drawings, which form a part thereof.

On the drawings:

Figure 1 is a front elevational view of a pouch embodying my invention;

Figure 2 is an enlarged fragmentary sectional elevational view taken substantially along the lines II—II of Figure 1;

Figure 3 is a top plan view of a pouch embodying my invention, showing the pouch in partially opened position; and

Figure 4 is a fragmentary detailed view of an apparatus for affixing a tab to a closure strip, in accordance with the principles of my invention.

As shown on the drawing:

In Figure 1, the reference numeral 10 indicates generally a pouch embodying the present invention, including a resilient sheet-like back wall 11 and a resilient sheet-like front wall 12 substantially co-extensive therewith and secured to the back wall along the side edges, at 13 and 14 and the bottom edge 15. Preferably, the walls 11 and 12 are made of sheets of thermoplastic synthetic resin materials such as polyvinyl chloride, polyvinylidene chloride, halogenated polyethylenes, polyvinyl acetate and polyethylene, and copolymers, heteropolymers and mixtures thereof. Such materials are substantially impervious to air and moisture, and may be prepared in suitably thin resilient sheets which are translucent, and substantially transparent, so as to be suitable for use in the instant pouch 10. The front and back walls 12 and 11 may be suitably heat-sealed, or sewed together, or both, along their marginal edges at 13, 14 and 15, so as to define a suitable air-tight and moisture proof container portion for the pouch 10.

As is best seen in Figures 1 and 2, the back wall 11 extends upwardly a short distance beyond the top 12a of the front wall 12. The top 11a of the back wall 11 is substantially parallel to but spaced upwardly from the top 12a of the front wall 12, along the free or unsecured edge portions of such walls 11 and 12, so as to define what amounts to an elongated slot-like opening that is substantially coplanar with the front wall 12, and which

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is filled with the instant closure or fastener arrangement, which will be described hereinafter.

The instant closure, herein designated by the reference numeral 16, is substantially co-extensive with the top portion of the back wall 11 extending above the top of the front wall 12, including the rounded ends, which extend laterally outward from the sides 13 and 14, as indicated at 16a and 16b respectively. The top edge 16c of the closure 16 is preferably heat-sealed, or otherwise sealingly affixed, to the top 11a of the back wall, the end portions 16a and 16b are, likewise, sealingly engaged along their outer edges to the back wall 11; and the bottom edge 16d is sealingly engaged with, and preferably integral with, the top 12a of the front wall 12, so as to provide a complete seal for the elongated slot-like opening defined by the front and back walls 12 and 11, as described.

As best shown in Figure 2, the fastener or closure assembly 16 of the present invention, includes a pair of identical interengaging strips 17 and 18. Each of the strips 17 and 18 can be conveniently fabricated by extrusion through a suitable die followed by serving the extruded strip to appropriate lengths.

Suitable materials for manufacturing the strips 17 and 18 include the thermoplastic and thermosetting organic synthetic resins.

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 starting material, since, in the case of rubber, it is more difficult to control the degree of rigidity for interlocking engagement between the strips 17 and 18. However, by proper compounding and vulcanizing of rubber the degree of rigidity can be controlled to make the rubber acceptable for the purposes of the instant invention.

The strips 17 and 18 which may be used in the practice of my invention include the closure strips such as those described and claimed in United States Patent No. 2,558,367, issued to Borge Madsen on June 26, 1951. The strip 17 includes a substantially flat, thin web portion 17a and an offset longitudinal marginal portion 19 substantially thicker than the thickness of the web 17a. Formed in the reinforced marginal portion 19 is an alternate series of a plurality, preferably two, of channels or grooves 20 and solid rib-like projections or ridges 21, extending in substantially parallel relationship the full length of the strip 17. As shown herein, the strip 17 and the reinforced marginal portion 19 extend substantially the full distance between the pouch side edges 13 and 14 (Figure 1) and the extremities of the reinforced marginal portion 19 are flattened so as to merge into the rounded ends 16a and 16b of the fastener assembly 16.

It will be seen that the strip 18 is substantially identical in cross-section to the strip 17, and the strip 18 is affixed to the back wall top 11a to extend downwardly therefrom so as to present an integral reinforced edge portion that is substantially symmetrical to the edge portion 19 of strip 17, the edge portion 19 of the strip 17 and the edge portion 22 of the strip 18 thereby presenting allochirally mateable grooves and ridges, on the contiguous faces thereof. The grooves and ridges are arranged substantially normal to, or at right angles to, the planes of the strips 17 and 18, or the planes of the flat

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unreinforced portions of the strips 17 and 18, such as the portion 17a of the strip 17. The grooves in one of the reinforced edges correspond in shape to the ridges in the other of the reinforced edges, and vice versa. Of course, a plurality of ridges may be employed in each reinforced edge, with an equal number of grooves arranged substantially as here shown.

As is best shown in Figure 4, the head portion 21a of each ridge 21 is enlarged and the neck portion 21b of each ridge 21 is constricted, so as to form an adjacent complementary groove 20 with a restricted opening thereinto and in an enlarged bottom portion, as shown. In this manner, the groove 20 in one of the strips 17 corresponds in shape to the ridge in the other of the strips 18, and vice versa. Also, the head portion 21a of each of the ridges 21 has an engaging surface 21c providing a portion overhanging the adjacent groove 20 in the same edge portion 19 and the engaging surface 21c of the ridge 21, shown in Figure 4, will be in opposed contact with a corresponding engaging surface of another ridge on the strip 18 when the respective edge portions 19 and 22 are interengaged. Also, the median plane of each of the plane portions 17a and 18a of each strip 17 and 18 passes through the ridge integral therewith, and these planes lie on opposite sides of the interface between the undercut surfaces 21c, 21c.

Each of the ridges 21 has, on the side toward its plane portion, 17a or 18a, and on that side only, an undercut surface 21c adjoining the head portion 21a with the neck portion 21b of the ridge 21, has hereinbefore described. The undercut surface 21c may be inclined (with or without the serrations thereon as shown in Madsen Patent No. 2,558,367) or the undercut surface 21c may be in a plane substantially parallel with the plane of the strip, and substantially aligned therewith, as here shown. Preferably, the median plane of each strip passes below the head portion 21a of the ridge 21.

As can be seen, the strip 17 which is affixed to the front wall 12 (or integral therewith) overlaps the strip 18 which is affixed to the back wall 11. A manually graspable finger tab 23 is suitably secured to the back or outside face of the reinforced edge 19 of the strip 17. The flap tab 23 is secured to the back of the edge portion 19 and extends upwardly therefrom in substantially parallel alignment with the opposing strip 18. The tab 23 may be integral with the strip 17 and the edge portion 19; but in such case, different dies may be used to extrude the strips 17 and 18, or the same die may be used so as to provide a thin plane strip extending from the reinforced edge portions 19 and 22. Such thin strip may be sheared off completely from the back closure strip 18, and it may be removed from the front closure strip 17 except for that portion necessary to define the tab 23 (unless it extends only a short distance from the strips 17 and 18).

Preferably, however, the tab 23 is made of a thermoplastic resin which is the same as or similar to that used in the walls 11 and 12, and in the strips 17 and 18; and the tab 23 is preferably heat-sealed to the strip 17. Ordinary heat-sealing methods call for the application of heat and pressure to the non-contiguous faces of two members to be heat-sealed, but the ordinary application of heat and pressure against the outside face 23a of tab 23 and against the front or working face of the reinforced edge portion 19 of the strip 17 would result in damage to the ribs 21 and/or

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grooves 20 to such an extent that the ribs 21 and/or grooves 20 would be unable to function properly in interlocking engagement. I have found a new and improved method of and apparatus for effectively securing or affixing the tab 23 to the back of the reinforced edge portion 19 of the strip 17.

In accordance with my improved method and apparatus, I provide spaced uniplanar rigid supporting members or pulleys 24 and 25 which present surfaces 24a and 25a that conform substantially in shape to the bottoms of each of the grooves 20, 20 in the reinforced portion 19 of the strip 17. Preferably, the pulleys 24 and 25 are substantially disk like members mounted for rotation on a shaft 26, so that the pulleys 24 and 25 may be rotated for relative movement between the strip 17 and the pulleys 24 and 25. In general, the top surfaces of each of the pulleys 24 and 25, which engage the bottom portions of the grooves 20, 20 must engage those regions of the grooves 20, 20 which are directly below the heat-sealing electrodes 27 and 28. Thus, if the heat-sealing electrodes 27 and 28 remain in a substantially fixed position and the strip 17 with the tab 23 thereon is moved longitudinally so as to provide a plurality of spaced contacts for the electrodes 27 and 28, then the shaft 26 remains in a substantially fixed position directly below the electrodes 27 and 28 and the shaft is permitted to rotate so that the pulleys 24 and 25 may rotate as the strip 17 is passed thereover. On the other hand, if it is desired to move the electrodes 27 and 28 and retain the strip 17 with the tab 23 thereon in substantially fixed position, then the shaft 26 is caused to move longitudinally so as to follow the movement of the electrodes 27 and 28; then the shaft 26 may or may not be rotated so as to accommodate rotary movement of the pulleys 24 and 25 which are maintained in contact with the strip 17 just below the electrodes 27, 28 at all times. In this manner, the application of heat and pressure between the top of the pulley 24 and the bottom of the electrode 27, in the manner well known in the art for effecting heat-sealing of thermoplastic sheet materials, results in the fusion or heat-sealing of the tab 23 to the back of the reinforced edge portion 19 in substantial alignment of the groove 20, and without and deformation of the groove 20 or the adjacent ridges 21, 21. The cooperation between the second electrode 28 and the top of the pulley 25 is substantially the same.

As will be appreciated, a secure and strong adherence between the tab 23 and the reinforced edge portion 19 is absolutely necessary, since the closure strips 17 and 18 are to be pulled apart, when the pouch 10 is opened, by the application of manual pulling on the tab 23 and on the top portion of the back wall 11, as indicated by the arrows in Figure 2. The tab 23 must then be secured to the closure strip 17 by means sufficiently strong to permit one to grasp the tab 23 in one hand and the juxtaposed plane portion of the strip 18 and the top of the back wall 11 in the other hand, and to pull in opposite directions so as to disengage the ridges and grooves which are interlocked at the contiguous faces of the reinforced edge portions 19 and 22. Accordingly, a very strong and effective heat-seal must be obtained, and if such heat-seal were obtained by normal means, the profile or shape of the reinforced edge portion 19 would most certainly be crushed or effectively altered, so that that particular portion of the reinforced edge 19 would be

incapable of sealingly engaging the corresponding contiguous face of the reinforced edge 22 on the strip 18.

On the other hand, it will also be appreciated that a suitable pulley arrangement which completely fills the grooves 20, 20 in the reinforced edge 19 would also be of such shape that it would cause alteration of the profile of the reinforced edge when such pulley would be removed from the edge after each sealing. I found that by employing the pulleys 24 and 25 which have the contour or profile corresponding to approximately one-half of each of the grooves 20, 20, and corresponding to that half of the grooves 20, 20 which does not have an overhanging ridge surface 21c, I may effectively insert the supporting surface of each of the pulleys 24 and 25 into their respective grooves 20, 20 and against the bottom thereof. The profile of each pulley 24 and 25 is shaped to conform substantially with a substantial proportion of the curved bottom of each of the grooves, so that such bottom is suitably supported and no deformation thereof takes place upon the application of pressure through the electrodes 27, 28.

It will thus be seen that by heat-sealing the tab 23 to localized spots or points on the back of the reinforced edge portion 19 which are aligned with the bottoms of the groove 20, 20, I may obtain suitably strong adhesion and overall structure for my intended purpose, as well as certain other advantages. For example, it might be expected by those skilled in the art that suitable structural strength could be obtained only by affixing the tab to the back of the reinforced edge 19 at points opposite the thick solid ridges 21, 21. I have found, in contrast, that by applying the tab 23 at heat-sealed points opposite the bottoms of the grooves 20, 20 I may apply such a tab 23 without causing deformation of the reinforced edge portion 19. In addition, I have found that by affixing the tab 23 to the rather thin sections of the reinforced edge portion 19 opposite the groove bottoms, I am able to more effectively open or disengage the closure strips 17 and 18 from their normal interlocking position. I believe that this is true because of the particular manner in which the tab 23 is affixed to the back of the reinforced edge portion 19. As will be seen best in Figure 4, the opening pull on the tab 23 results in a pull of greatest magnitude at the back of the reinforced edge 19 at approximately the point at which heat-sealing of the tab 23 to the edge portion 19 is effected between the pulley 24 and the electrode 27. This pull results in the application of a torque-like pull (in cross-section) upon the outer ridge 21. The ridge 21, being of flexible resilient material, thus tends to disengage itself from the corresponding groove of the edge portion 22 of the strip 18 by a slight clockwise rotation (as shown in Figure 4), which rotation is facilitated by the fact that the root or base of the ridge 21 is not directly heat-sealed to the tab 23. By effectively sealing the tab 23 to the reinforcing edge 19 slightly inwardly of the root of the ridge 21, I have found that the ridge 21 is afforded slightly greater freedom of movement, although the sealing and interlocking cooperation between the outer or terminal ridge 21 and the corresponding groove of the opposite reinforced edge portion 22 is in no way impaired.

In carrying out the instant method of affixing the tab 23 to the back of the reinforced edge portion 19, I may employ any of the well known

heat-sealing operations involving the application of heat and pressure as here shown. If desired, I may first apply a softening solvent at the interface between the tab and the reinforced edge 19. Ordinarily this is not necessary, and the seal is effectively obtained merely by urging the heated electrodes 27 and 28 against the outer surface of the tab 23, so as to effectively squeeze together the elements 23 and 19 and to fuse the same together.

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 pouch comprising front and back sheet-like wall portions having mating edges united together to define a container and having corresponding free upper edges spaced from each other to define an opening into said container on the front side thereof, a first closure strip secured to the free upper edge of said back wall to extend the length thereof and downwardly therefrom, a second flat closure strip secured to the free upper edge of said front wall to extend the length thereof and upwardly therefrom to overlap said first closure strip, said closure strips having offset integral thickened reinforcements and said reinforcements having on confronting faces longitudinally extending grooves and ridges, each of said ridges having an enlarged head portion and a restricted neck portion and each of said grooves having a restricted opening and an enlarged bottom portion, said groove in one of said reinforcements being aligned with and corresponding in cross-section to the ridge in the other of said reinforcements and vice versa, the corresponding ends of said reinforcements being mated and united integrally with each other and with said front and back wall portions, and an integral extension along the exposed face of the reinforcement of said second closure strip projecting upwardly therefrom and generally parallel to and spaced from said first closure strip, whereby said reinforcements can be separated to provide an opening into said container by grasping said extension and pulling the same away from said first closure strip.

2. A pouch comprising a resilient sheet-like back wall, a resilient sheet-like front wall secured to the back wall along side and bottom edges to form a container open at the top, said back wall extending upwardly a short distance beyond the top of said front wall, a first closure strip on the top of said back wall and extending downwardly therefrom, a second closure strip on the top of said front wall and extending upwardly therefrom to overlie said first strip, each strip having a plane portion and an integral reinforced edge portion, each reinforced edge portion having a continuous solid ridge and a continuous groove arranged longitudinally of the edge portion, the head portion of each ridge being enlarged and the neck portion of each ridge being constricted to form an adjacent complementary groove with a restricted opening thereinto and an enlarged body portion, the groove in one of said strips being aligned with and corresponding in shape to the ridge in the other of said strips and vice versa, corresponding ends of said reinforced edge portions being interengaged and being united to each other and to said front and back walls to define an opening into said container substantially the length thereof between said side edges, and an extension inte-

gral with and projecting from said second closure strip in spaced relation to said first closure strip to facilitate separation thereof.

3. A sliderless fastener structure of the type that is closeable by being manually pressed together progressively longitudinally thereof, comprising two air and moisture impervious flexible sheets lying generally in the same plane and having overlapping longitudinally extending edge portions, said edge portions being constituted by offset integral thickened reinforcements having on confronting faces longitudinally extending grooves and ridges, each of said ridges having an enlarged head portion and a constricted neck portion and each of said grooves having a restricted opening and an enlarged bottom portion, said grooves in one of said reinforcements aligned with and corresponding in cross-section to the ridges in the other of said reinforcements and vice versa whereby said reinforcements may be interengaged by being pressed together progressively along the lengths thereof, corresponding ends of said reinforcements being so interengaged and being integrally united to each other and

to said sheets, and an integral extension on an exposed outer face of one of said reinforcements projecting laterally therefrom and generally parallel to and spaced from the sheet having the other of said reinforcements, whereby said reinforcements may be separated from each other by grasping said extension and pulling the same away from the other of said reinforcements.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,711,349	Howard -----	Apr. 30, 1929
1,927,751	Mensi -----	Sept. 19, 1933
2,474,495	Poliak -----	June 23, 1949
2,475,277	Budnik -----	July 5, 1949
2,479,375	Langer -----	Aug. 16, 1949
2,514,750	Dobbs et al. -----	July 11, 1950
2,558,367	Madsen -----	June 26, 1951
2,560,535	Allen -----	July 17, 1951
2,613,421	Madsen -----	Oct. 14, 1952