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J. ROBINSOHN

2,632,220

SLIDE FASTENER

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3 Sheets-Sheet 2

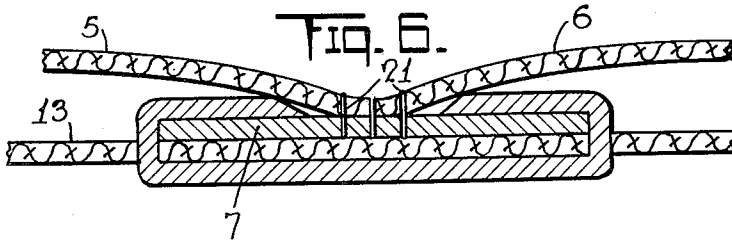


Fig. 7.

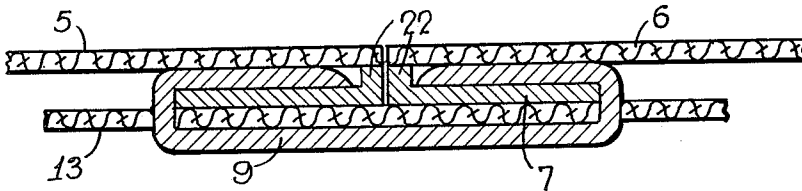


Fig. 8.

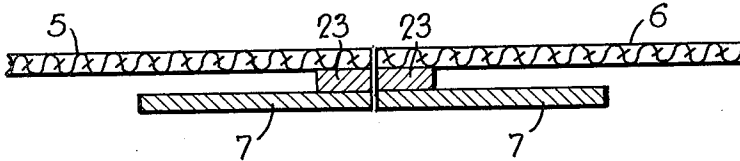


Fig. 9.

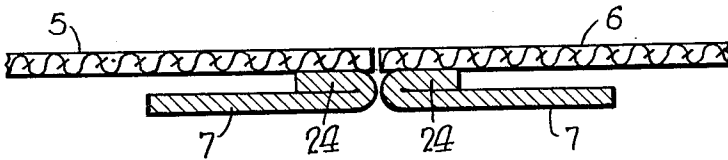


Fig. 10.

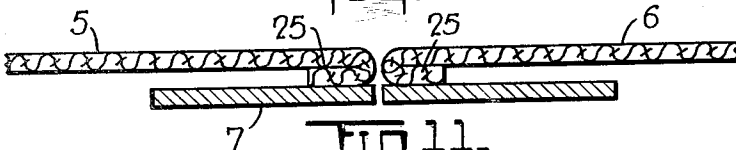
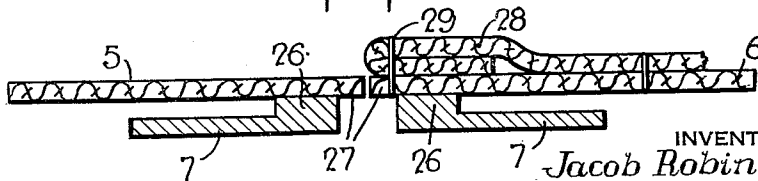


Fig. 11.



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Fig. 12.

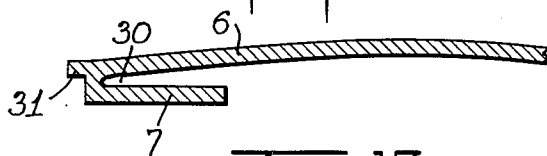


Fig. 13.

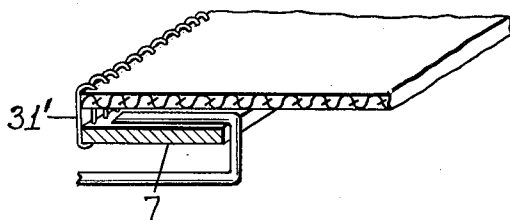
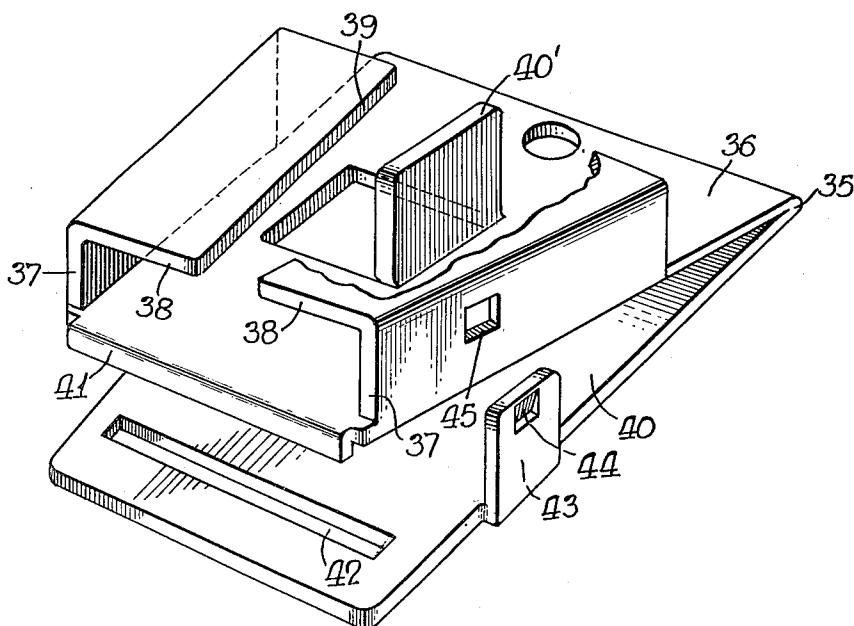


Fig. 14.



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SLIDE FASTENER

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2 Claims. (Cl. 24—207)

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My invention relates to a slide fastener, and this application is a continuation in part of my application Serial No. 554,176, filed September 15, 1944, now Patent No. 2,418,482, April 8, 1947.

It is the general object of the invention to provide an improved form of slide fastener which is simple in construction, cheap to manufacture, and effective in use.

It is a more specific object to provide a slide fastener constructed and arranged so as to avoid wear, catching, abrasion, or puncturing of the material being fastened by my fastener.

Another object is to provide a slide fastener which may be of universal application in that it need not be made or sold in predetermined lengths but may be cut to and applied in the desired length by the user.

It is another object to provide improved rail means for a slide fastener of the character indicated.

Another object is to provide improved means of arranging rail means and side tapes or garment edge attaching means.

Another object is to provide rail means with improved means for securing garment edges or the like thereto.

Another object is to provide improved means of cooperation between slide fastener rails and side tapes or garment edges attached thereto.

It is another object to provide an improved form of lead slide or clasp for a fastener of the character indicated.

Other objects and various features of the invention will be hereinafter pointed out or will become apparent to those skilled in the art.

In the drawings which show, for illustrative purposes only, preferred forms of the invention—

Fig. 1 is a fragmentary view in front elevation of a garment or the like having an opening with one form of my improved slide fastener incorporated therein, parts being broken away to illustrate various features of construction;

Fig. 2 is an enlarged fragmentary sectional view, taken substantially in the plane of the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary isometric view of the slide fastener of Fig. 1, slightly modified, parts being broken away;

Fig. 4 is a sectional view, taken substantially in the plane of the line 4—4 of Fig. 1;

Fig. 5 is an isometric view of a clasp carrier tape showing slide clasps and a lead or guide clasp, together with a finger pull;

Figs. 6 to 13, inclusive, are fragmentary sec-

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tional views on enlarged scales of modified forms of rails and attachments; and

Fig. 14 is an enlarged isometric view of a clasp.

Briefly stated, in a preferred form of the invention I employ a pair of side rails which are stiff transversely but flexible longitudinally. These side rails are attached to or form part of flexible side tapes or garment edges at the opening to be closed by my improved fastener. The rails extend outwardly from the edges to be held together so that the rails may be said to extend transversely outwardly or oppositely to each other. The engageable or clasp enclosed portions of the rails are slightly spaced from the tapes or garment edges carrying the same to provide a channel or space for the intumed prongs of the clasps which slidably embrace the rails and thus serve to hold the edges of the opening together. The clasps are rigid and are preferably formed of a single piece of material such as wire or the like bent into generally rectangular, flat, C-shaped form so as to quite closely embrace the rails and hold them in relatively fixed spatial relation to each other and to the clasp, thus preventing the rails from overlapping or riding up and slipping out of the clasps. The clasps are carried by a carrier, which may be generically referred to as a clasp tape, as will be later described.

In that form of the invention illustrated in Figs. 1 to 5, the side tapes 5—6, or parts to be fastened together, have relatively narrow strips of stiffening material 7 secured to the edges thereof. These stiffened edges 7 are preferably in the form of relatively narrow strips of plastic or similar material which are flexible longitudinally but quite stiff transversely. The rail 7 may be secured to the side tapes 5—6 in any suitable manner, such as by employing adhesives, by thermoplastic adhesion or embedding, or by sewing, etc. When the fastener is assembled and the fastener is holding together parts of the garment or other article, the stiffened edges or rails secured to the flexible side tapes 5—6 are turned underneath by return bending the flexible side tapes, as illustrated particularly in Fig. 2. In the preferred form, the extreme outer or free edges of the rails 7 extend slightly beyond the corresponding edge of the return bent portion 8 of each tape. Thus, the extreme outer or free edge of each rail forms a smooth bearing surface for the slide clasps.

The preferred form of clasp may include a flat base 9, short bent up sides 10—10, and intumed

ends or prongs 11—11, the inside bends being preferably square to provide flat bearing surfaces or sides 10—10 for the free bearing edges of the rails 7. The wire may be of square or rectangular cross-section, with slightly rounded corners, and the prongs 11—11 are preferably tapered or beveled as is clearly illustrated in Figs. 2 and 3. The rails 7—7 may be so formed in relation to the prongs 11—11 that there is substantially no possibility of any contact between the prong ends and the fabric or other material of the side tapes. In the specific form shown in Figs. 1, 2 and 3, each rail 7 has an upstanding bead 12 at its inner edge and the prongs 11—11 extend into proximity to but out of contact with the beads. Thus, the side tapes extending upwardly and over the beads are held by the latter out of engagement with the prong ends, it being understood that the outer free edges of the rails engage the upstanding portions 10 of the clasps so as to prevent the prongs from riding inwardly into contact with the beads. Thus, the side tapes are fended off from any stressed contact with the ends of the prongs. The inner edges of the rails 7 are preferably square and lie in proximity to each other so as to prevent one from riding up on the other and slipping out of the clasp.

The slide clasps are carried by a clasp carrier, which may be referred to generically as a clasp tape 13. As illustrated, the clasp tape is a fabric strip, which may be treated with plastic, and the slide clasps are secured to the tape by having the prongs pierce through the tape before the prong ends are bent over inwardly. All this will be clear from Figs. 2, 3 and 5.

The edges of the material 14 to be held together form part of or are secured to the side tapes 5—6 as by stitching 15. When the said edges are fastened or held together, the clasp tape 13 is extended lengthwise and the clasps are spaced apart so as to hold the side tapes and attached garment edges at such spaced apart points. Normally, the proportions of the various parts are such that the parts of the side tapes extending between the prongs of the clasps are practically in contact with each other, and the adjacent edges of the garment material may be in engagement with each other so as to form an almost invisible meeting of the edges similar to a seam. When the fastener is to be opened, the clasp tape may be actuated so as to cause the slide clasps to gather together, and the material of the clasp tape 13 will simply form pleats or folds between adjacent clasps, and since the clasps are of relatively small dimensions, the edges defining the opening may be separated practically down to its end. By extending the rails down beyond the end of the opening, the clasps may be beyond the end of the opening so that the latter may be opened all the way to its end. By reason of the fact that the clasps ride on the hard bearing edges of the rails 7—7 and the tapes or garment edges are fended off from the clasp prongs, the clasps may be made of thin wire or the like, and the clasps being of such small extent along the tape may be closely spaced to prevent gapping, and yet when all of the clasps are bunched to permit separation of the edges of the opening they will occupy but little space and the pleating or folding up of the tape will thereby be facilitated.

To actuate the clasp tape, the latter may be grasped and moved back and forth. However, the clasp tape is usually concealed inside the garment back of the opening and it is usually desirable to provide some form of attached lead clasp or guide

as the leading clasp and to provide means for operating the latter from the side opposite the tape. For example, as shown in Figs. 4 and 5, a metal, plastic, or other plate 17 may be provided with upturned sides and inturned flanges 18 so as to be in large part of very much the same form in section as the slide clasps 9 heretofore described. The guide formed by the plate 17 and inturned flanges 18 is designed to be much stronger than the wire clasps and serves admirably as a lead clasp. Such a lead clasp may be slipped onto the rails 7—7 and secured to the front end of the clasp tape 13. A pull 16 may have an eye extending through a hole in the plate 17 and through the clasp tape. The pull may extend out between the edges of the opening and be provided with an enlargement or finger grip as shown particularly in Figs. 1, 4 and 5.

Where the garment or other article adjacent the fastening is subjected to considerable side strain, there may be a tendency toward gapping at points between adjacent clasps, particularly when the clasps are relatively far apart. In order to reduce such tendency to gapping, I may provide extra stiffening on the side tapes such as plastic treatment of the tape or by strips 7' (Fig. 3) flexible longitudinally but stiff transversely on the side tapes. Thus, the strain on the tape or garment will be more uniformly distributed among the clasps, and gapping will be reduced to a minimum.

While the rails and carrying tapes or garment edges may be advantageously formed and secured together as described in connection with that form shown in Figs. 1 to 4, those parts may be otherwise assembled and arranged, for example, as shown in Figs. 6 to 13, inclusive.

In that form shown in Fig. 6, the rails 7—7 may be secured to the side tapes 5—6 by adhesives, thermoplastic adhesion, or by stitching 21 or the like. The prongs of the clasps 9 will thus fit between the rails 7 and the side tapes, as shown in Fig. 6. The side tapes 5—6 in this form, as well as in the other forms already or to be described, may be formed of plastic, cloth, or similar material, or combinations of materials.

In that form shown in Fig. 7, the rails 7—7 may be provided with integral upstanding bosses or projections 22, and the side tapes 5—6 or garment edges may be secured to those bosses by any of the means heretofore described. The upstanding bosses 22 serve to provide considerable space between the rails 7 and the attached side tapes 5—6 so as to nicely accommodate the inturned prongs of the clasp.

In that form shown in Fig. 8, the rails 7—7 and tapes 5—6 are secured to each other by means of spacer strips 23—23 of suitable material such as plastic or other material, which may be secured to the side tapes and the rails by any of the methods heretofore described. These spacer strips 23—23 serve much the same spacing purposes as the upstanding bosses or projections 22—22 of Fig. 7. The clasps and clasp tape have been omitted from Fig. 8, as well as from Figs. 9 to 12, since the construction and assembly are the same as in Figs. 6 and 7.

In that form shown in Fig. 9, the rails 7—7 have folded over inner edges as shown at 24—24, and the folded over edges are secured to the side tapes by any of the methods heretofore mentioned. The folded over edges having some thickness serve to provide channel space for the inturned prongs of the clasps 9, as will be understood.

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In that form shown in Fig. 10, the inner adjacent edges of the side tapes 5—6 are turned under as shown at 25 and the folded over edges 25 serve as spacers between the rails and the side tapes. Any of the methods heretofore mentioned may be employed for securing the rails 7 to the intumed ends 25.

In that form shown in Fig. 11, the rails 7—7 have upstanding projections 26—26 and the side tapes 5—6 are secured to the upstanding projections 26 by any of the methods heretofore described. However, in the form shown in Fig. 11, the side tapes whether secured to the projections 25, or whether forming integral parts thereof, extend inwardly toward each other so as to provide projections 27—27 beyond the inner adjacent edges of the rails 7—7. Thus, the garment or other opening edges 28 may extend up to the inner adjacent edges of the projections 27—27 and may be secured to the projections as by stitching 29. This method of attachment of the garment edges 28 has some advantages over the methods heretofore described. This particular type of construction with the projection may be employed with the forms shown in Figs. 6 to 10 and 13.

It should be understood that in all of the forms shown in Figs. 6 to 13, the tapes 5—6, if not the garment edges themselves, will be attached to the garment edges by stitching or other means.

In that form shown in Fig. 12, the rails 7 and corresponding side tape 6 are formed as one integral piece and are preferably spaced from each other as shown at 30. A projection 31 may be formed on the integral structure and serves the same purpose as the projection 27 shown in Fig. 11.

In that form shown in Fig. 13, the rail 7 is secured to the side tape 6 by a very flexible joint, such as by stitches 31', which are preferably sufficiently loose or open so that the rail 7 and side tape 6 may be sufficiently spaced apart to accommodate nicely the prongs of the staples, as will be clear from Fig. 13.

Fig. 14 illustrates a lead or guide clasp. This lead clasp may be formed of a single piece of sheet metal, plastic, or the like. In the form shown, a sheet is bent upon itself, as indicated at 35. The upper sheet 36 has upstanding sides 37—37 and intumed flanges 38—38 so that the cross-section of the structure corresponds quite closely to the shape of the wire clasps 9 heretofore described. The drawing shows the lead clasp somewhat out of proportion merely for the sake of clearer illustration. The lead clasp is preferably tapered from a widthwise enlarged entrance mouth at one end to the exit end where the inside dimensions are about the same as those of a clasp. The widths of the flanges 38 correspond closely to the lengths of the clasp prongs and therefore the side tapes and rails are fended off from the flanges just as from the prong ends of the clasps as heretofore described. An upstanding spacer 40' may be formed as by slitting the metal of one of the plates such as 36, as shown, and the metal turned up so as to form the spacer 40' midway between the edges of the intumed flanges 38—38. Thus, the rails 7—7, which will be housed between the plate 36 and the flanges 38, will be separated from each other and held in the lead clasp against overlapping or riding up and slipping out.

The upper plate 36 and the lower plate 40 cooperate with each other to hold the forward end of the clasp tape. In the form shown, the upper plate 36 has a down-turned flange 41 designed to

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fit into the slot 42 in the lower plate. Thus, in use the forward end of the clasp tape 13 is passed between the plates 36—40 and the two plates then pressed together so as to force the clasp tape down into the slot 42 where it will be securely held by the down-turned flange 41. The plates may have interengaging means for holding the same in closed position. In the form shown, the lower plate 40 has upturned ears or lugs 43 having a cut metal edge 44 partly punched out so as to cooperate with shoulders or abutments 45, which may be formed merely by piercing the upstanding sides 37 on the upper plate, all as will be understood. The forward end of the lead clasp may be provided with a hole for attachment of a finger pull or other means.

A principal feature of the invention is the combination and arrangement of the side tapes or garment edges and the clasps. The housed portions of the rails or stiff edges carried by the side tapes are somewhat wider than the lengths of the overlying prongs of the clasps. This is well illustrated in Fig. 2. Since the free edges of the rails engage the outer bends of the clasps, there is no tendency for the prongs to be forced through the side tapes or against beads or spacers of the rails and thus impede travel of the clasps or injure the side tapes or the fabric of the garment or the beads or spacers of the rails. The running of the clasps along the thin smooth edges of the rails makes for very easy operation of the fastener as a whole. Since the rails bear on the outer ends of the clasps, side stresses tending to separate the side tapes or garment opening actually tend to seat the rails more firmly in the clasps rather than tending to pull the rails out of the clasps as in some other forms of fasteners. Because of the hard bearing surfaces and the fending off, the clasps may be made very thin, as of wire. The bunched clasps therefore take up very little space and clasps may be closely spaced on the clasp tape to avoid gapping. My fastener may be made of very small dimensions so as to be inconspicuous. The edges of the opening may approach or even touch each other. No metal need be visible from the front of the garment.

While the clasps may be made of very small dimensions so that when they are bunched they take up very little space, and the opening may extend practically to the bottom, it is also possible to extend the rails sufficiently so that there need be no bunching of the clasps at all and the tape may be pulled from the bottom along the extended rails to permit a full opening without any bunching of the clasps whatever.

While I have used the term "garment" herein, it should be understood that the term is used in a generic sense, since my fastener may be employed to fasten linings, slip covers, bags, and the like. Furthermore, the side tapes in some cases may be the edges themselves of the two sides of a garment, bag or the like to be fastened together, and the term "side tapes" unless otherwise indicated should include such other elements.

While the form shown in Figs. 1 to 6, involving a return bending of the side tapes, has certain advantages, it will be seen that other methods of forming the rails and side tapes are entirely feasible and have certain advantages of their own.

In my aforesaid Patent 2,418,482, the claims are directed to the entire slide fastener, including the reversely bent side tapes which are adapted to be sewed to the garment, and the stiff-

ened rails carried by the side tapes, these rails being preferably formed by applying a plastic material to the side tapes outwardly with respect to the reverse bends thereof. The claims in the present case are directed to a sub-combination feature, namely the flexible clasp carrier tape having clasps pierced through the tape and thereby anchored to the tape.

While the invention has been described in considerable detail and preferred forms illustrated, it is to be understood that various changes may be made within the scope of the invention as defined in the appended claims.

I claim:

1. As an article of manufacture, a slide clasp carrier tape including a strip of flexible material, and a plurality of clasps at spaced intervals along the tape, each of said clasps comprising a substantially flat back lying wholly against the outside of the tape, said clasps further comprising end portions extending at substantially right angles to said back portion and pierced through the tape, between the side edges thereof, thereby anchoring the clasp in place on the tape, said clasps further comprising front portions inwardly bent toward each other with the ends thereof spaced apart, said end portions being substantially longer than the thickness of the tape, whereby said inwardly bent portions are spaced a substantial distance above the adjacent surface of the tape, thereby providing a space be-

tween the underside of said inwardly bent portions and the adjacent surface of the tape, adapted to receive stiffened members with which the clasps slidably engage, said clasps being narrow and of small extent lengthwise of the tape, whereby pleating of the tape is facilitated.

2. The combination as set forth in claim 1, wherein the ends of said front portions of the clasps are beveled.

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