Dec. 23, 1941. J. BROZEK 2,267,370

SLIDE FASTENER

Filed Aug. 9, 1940

Fig. 1.

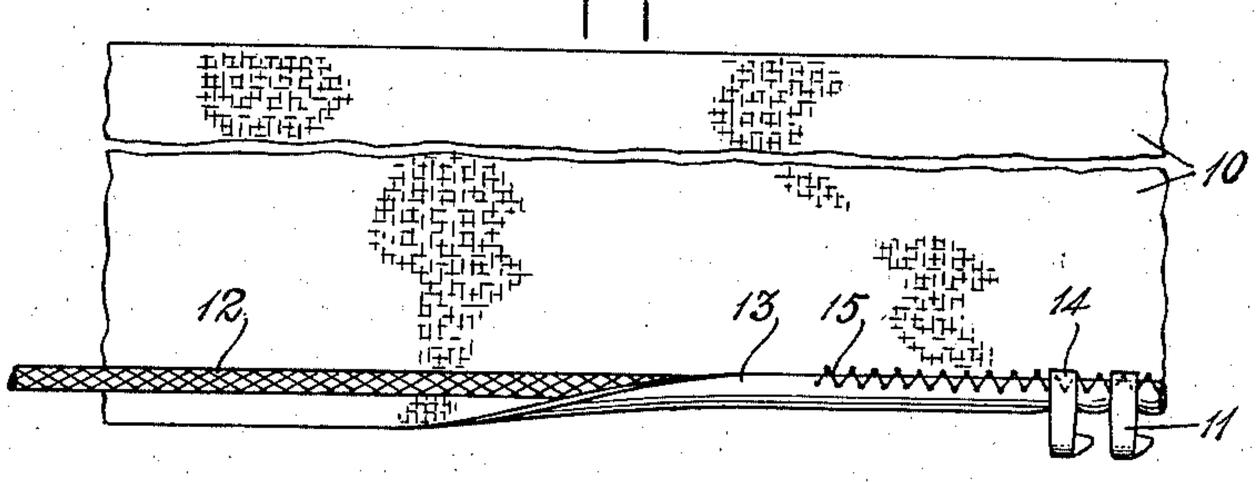


Fig. 2.

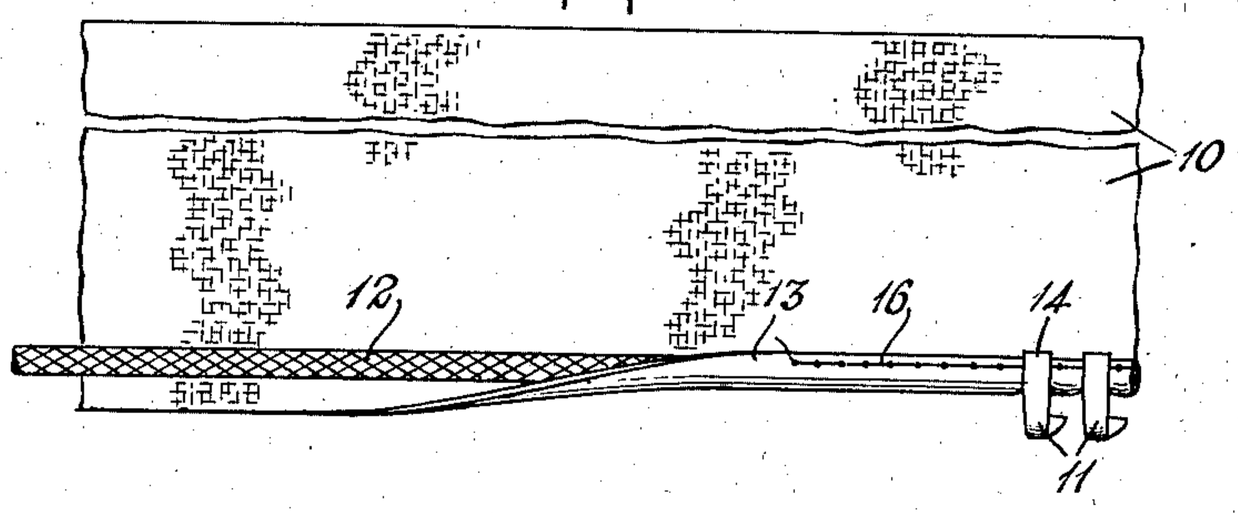


Fig. 3.

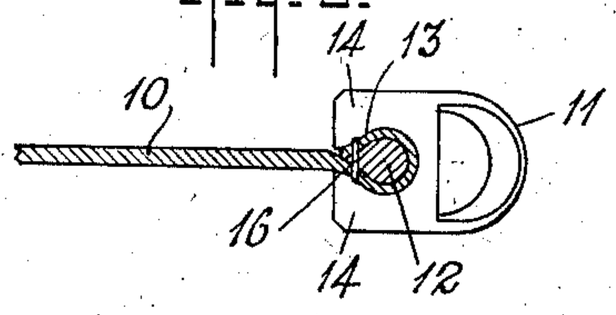


Fig. 4.

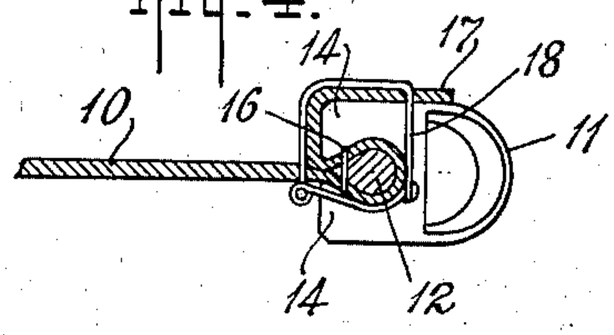
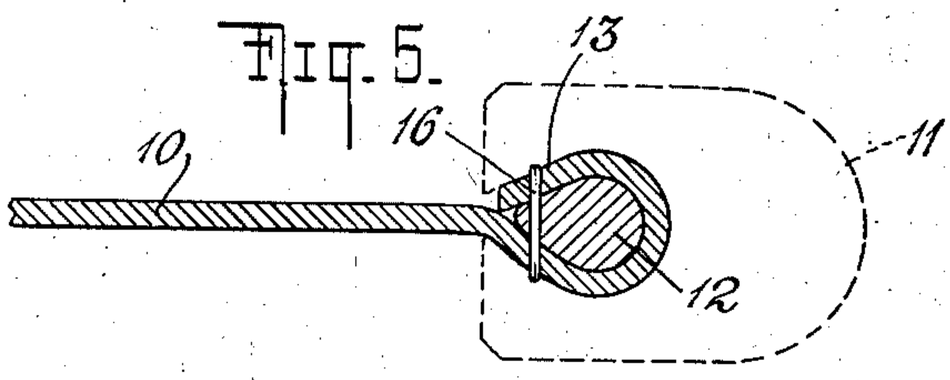


Fig. 5.



WITNESS
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2,267,370

SLIDE FASTENER

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Application August 9, 1940, Serial No. 351,940

4 Claims. (Cl. 24—205)

This invention relates to the manufacture of separable fasteners of the slide-operated type. A fastener of this type usually comprises a pair of stringers or tapes having reenforced opposed edges to which the interlocking fastener elements are attached in closely spaced relation by means of suitable clamping jaws. The edge of a stringer may be reenforced in various ways, i. e., by sewing one or two cords to one or both sides, respectively, of the longitudinal edge portion of the stringer; by weaving or braiding a twisted cord in the edge of the stringer when it is manufactured; or by folding the edge of the stringer or tape about the cord and applying a longitudinal line of stitches adjacent to the cord inwardly of the folded edge of the tape or through the cord and tape or depending upon the clamping jaws of the interlocking elements to hold the cord and tape together.

As is well known to those skilled in the art, the clamping or clinching of the fastener elements to the reenforced edges of the stringer tapes causes the tapes to lose their straight flat shape and to assume a curved shape in which the reenforced edges are convexly curved while the opposite edges are concave. This condition is believed to result from the fact that the tools for clamping the elements on the tape comb the tape in a direction opposite to that of the direction of feed so that the cord travels relatively faster than the tape and from the fact that as the tape and cord are made of relatively flexible and elastic materials, the crushing forces to which they are subjected by the clamped elements cause them to elongate along the reenforced edge. This is especially noticeable with stringer tapes in which the cord is woven and in which the cord is merely enclosed by a line of stitches. The result is that when the tapes are secured to a garment or the like, the reenforced edges thereof to which the elements are attached assume a wavy or rippled condition which is highly objectionable because it destroys the neat appearance of the fastener, causes unsightly bulging or puckering of the garment material to which the tapes are attached and restricts the free movement of the slider along the rows of elements.

In an attempt to remedy the foregoing disadvantages the art has tried various methods of combining the stringer with the reenforcing cord and the fastener elements but such known methods, so far as applicant is aware, have never succeeded in completely eliminating the undesirable results previously mentioned. The art accordingly in addition to such methods of combining these parts, has adopted the practice of washing the stringers after the fastener elements have been attached, then stretching the stringers to make both longitudinal edges thereof as straight as possible, then starching the stringers in their straightened condition and finally pressing them. There is then provided to the customer an article which is free of the disadvantages previously mentioned but as soon as the stringers of a fastener are washed with the garment to which they are attached, the stringers again assume the condition in which they were before being subjected to the stretching and starching procedure.

The object of the present invention is to provide an improved method of manufacturing fastener stringers which will overcome the difficulties above mentioned and will provide an improved product which has special advantages over prior constructions as will hereinafter become more apparent.

In the accompanying drawing Fig. 1 illustrates a portion of a stringer tape in the process of being constructed according to the teachings of this invention; Fig. 2 is a view similar to Fig. 1 but showing a different method of stitching the cord to the tape; Fig. 3 is a sectional view of a completed stringer tape showing the relationship of the parts; Fig. 4 is a view similar to Fig. 3 illustrating a modified form of the invention, and Fig. 5 is a view similar to Fig. 3 and showing the tape and cord assembly before the elements are clamped in position thereon, one of the elements being shown in dotted outline.

In the drawing, in which similar reference characters indicate similar parts throughout the several views, the numeral 10 refers to a base strip or stringer tape upon which the fastener elements 11 are attached. Extending along one side edge of the tape 10 is a cord 12 which preferably is made of cotton and composed of five coiled strands with each strand composed of three coiled threads. The tape 10 is folded back along such edge around the cord 12, the folded portion thereof which is designated by the numeral 13, having a width substantially equal to the normal diameter of the cord 12 so as to just enclose the latter and less than the length of the jaws 14 of the fastener elements 11 so that such jaws extend back from the folded edge of the tape beyond the inturned edge of the folded portion 13 thereof. Extending lengthwise of the tape is a line of stitches which extend through the tape 10, the cord 12 and the folded portion

13 of the tape. The stitches penetrate the folded portion 13 adjacent the longitudinal free edge thereof and penetrate the cord 12 along a line substantially offset from the axial center of the cord, as can be seen more clearly from Fig. 5 of the drawing. The stitches are preferably so positioned that they just catch the inner longitudinal edge portion of the cord and in the unclamped condition of such parts are wholly contained in a region intermediate horizontal planes tangential to the outer surface of the folded portion 13 and to the under surface of the body portion of the tape underlying the cord and normal to a vertical plane passed through the axial center of the cord. For the construction illustrated in Fig. 1, the line of stitches are designated 15 and are of a zig-zag nature, one end of each of the stitches extending through the tape 10 only at a point adjacent to the edge of the folded portion 13 while the other end of the stitch penetrates through the tape 10, the folded portion 13 and the cord 12. In the construction illustrated in Fig. 2 of the drawing, the line of stitches designated 16 is composed of straight stitches extending longitudinally of the cord and penetrating both the cord 12, the tape 10 and the folded portion 13 thereof.

In making the stringers above described, the tape 10 is progressively folded along one edge about the cord 12, as is indicated in Figs. 1 and 2 of the drawing. The fold as has been previously mentioned is only sufficient to enclose the cord 12 so that when the line of stitches are applied the free edge of the folded portion 13 of the tape and the stitched side of the cord will be substantially in alignment. At the same time that the edge of the tape is being folded, the longitudinal line of stitches are progressively applied so that as soon as a portion of the tape is folded over the cord, the latter together with the tape and folded portion thereof are secured together. During this operation the tape and the cord are fed while under tension, the tension on the cord however being substantially greater than that on the tape 10. Thus after the sewing operation, the tape will, due to the increased tension of the cord, assume a radial form, the beaded edge of the tape being the shorter side and concaved in form. The tape as thus formed is then fed to a machine where the fastener elements 11 are progressively clamped into position on the tape, the crushing action exerted by the jaws 14 of the elements causing the tape to elongate on the cord side and causing the radial form of the tape to assume a straight form.

As a result of the foregoing it will be observed that the cord is caught and fixedly secured in position with relation to the tape at the same time that the short flap or folded portion 13 is stitched in position and in this way it is prevented from moving relative to the tape when subjected to the combing action of the tools applying the fastener elements and the crushing action of the clamping jaws of such elements. In view of the fact that the folded portion 13 does not extend beyond the inner ends of the jaws of the fastener elements, such portion when the elements are clamped in position will not be visible, as is clearly shown in Figs. 1 and 2 of the drawing. Consequently, the tape has the appearance of a single tape and not of a tape with an extended flap. By reason of this construction also, the longitudinal free edge of the folded portion 13 is fixedly clamped in position so that it will not turn up in usage to present an unsatisfactory appearance and will not interfere with the operation of the slider whose inturned flanges engage the inner ends of the jaws of the fastener elements. Furthermore by having the longitudinal line of stitching just catching the inner side of the cord there is prevented any danger of the clamping jaws of the elements cutting through the stitches when the elements are being applied to the corded edge of the tape. This method of stitching is also of advantage where the folded portion is made sufficiently wide to enable it to be reversely folded over the clamping jaws of the elements as is indicated by the folded portion designated 17 in Fig. 4 of the drawing. When the line of stitching extends through the center of the cord or when it is lies adjacent to the cord without penetrating the same, the reverse fold of the cover portion forms a poor shoulder due to the fact that a so-called "air gap" is formed between the cover portion and the inner ends of the clamping jaws of the elements and due to the fact that the regularity and evenness of the portion overlying the elements cannot be controlled. With applicant's method however, a sharply defined shoulder is provided, the cloth of the folded portion snugly and tightly enclosing the clamping jaws of locking elements without any intermediate air gap or looseness and being capable of being laid evenly and regularly over such clamping jaws, whereby a ridge or track is formed which will facilitate the operation of the slider thereover. The covering portion 17 is maintained in this condition by a longitudinal line of stitches which are designated 18 in Fig. 4 of the drawing, and which securely fasten the covering portion 17 to the upper surfaces of the elements 11.

While I have in this application described and illustrated specific preferred embodiments which my invention may assume in practice, it will be understood that various changes and modifications thereof may be made without departing from the scope of the invention as defined in the appended claims.

I claim:

1. In a fastener structure of the slide-operated type, a flexible supporting strip folded along a longitudinal edge to provide a turned back folded portion, a strengthening cord extending longitudinally of the strip and being positioned intermediate the body of said strip and said folded portion and against the interior surfaces of the fold formed along the longitudinal edge of the body of the strip so as to be enclosed between said folded portion and the longitudinal edge portion of the body of the strip, a line of stitches penetrating said folded portion, cord and body of the strip and permanently securing the same together, said line of stitches being offset from the axial center of said cord and penetrating said cord closely adjacent to the longitudinal edge thereof which is diametrically opposite the fold of said strip so that said line of stitches just catches the inner longitudinal edge portion of the cord and in the unclamped condition of said cord are wholly contained in a region having a width less than the space intermediate horizontal planes parallelly disposed to the body of the strip, tangential to the upper and lower surfaces of the portions of the strip enclosing said cord and normal to a vertical plane passed through the axial center of the cord, and a row of fastener elements having clamping

jaws clinched to said reenforced edge of said strip.

2. A fastener structure such as set forth in claim 1 in which said folded portion has a width less than the length of the clamping jaws of the fastener element and in which the line of sewing is composed of zig-zag stitches, one end of each of said stitches penetrating the body portion and folded portion of said strip and the cord and the other end of said stitches penetrating the body portion only of said strip.

3. A fastener structure such as set forth in claim 1 in which said folded portion has a width less than the length of the clamping jaws of the fastener elements whereby said tape has the appearance of a single tape and said folded portion will not interfere with the operation of the slider during usage.

4. In a fastener structure of the slide-operated type, a flexible supporting strip folded along a longitudinal edge to provide a turned-back folded portion, a strengthening cord extending longitudinally of the strip and being positioned intermediate the body of said strip and said folded portion and against the interior surfaces of the fold connecting said folded portion with the longitudinal edge portion of the body of the strip, said folded portion having a width such that the cord is just enclosed by said turned-back folded portion, a line of stitches penetrating said folded portion, cord and body of the strip and permanently securing the same together, said line of stitches extending longitudinally of the supporting strip, penetrating said folded portion along the free edge thereof and penetrating the inner longitudinal edge of the cord underlying the free edge of the folded portion, leaving the main body portion of the cord unsecured by the stitches of said line of stitches, and a row of fastener elements having clamping jaws clinched to said reenforced edge of the strip, the lengths of said jaws being such that the free ends thereof extend inwardly beyond the free edge of the folded portion.

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