April 29, 1930. F. GALLINA ET AL 1,756,736

FASTENER

Filed May 12, 1927

Fig. 1.

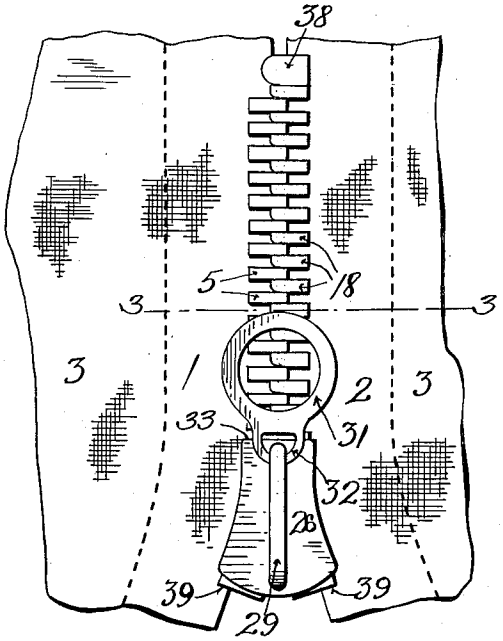


Fig. 2.

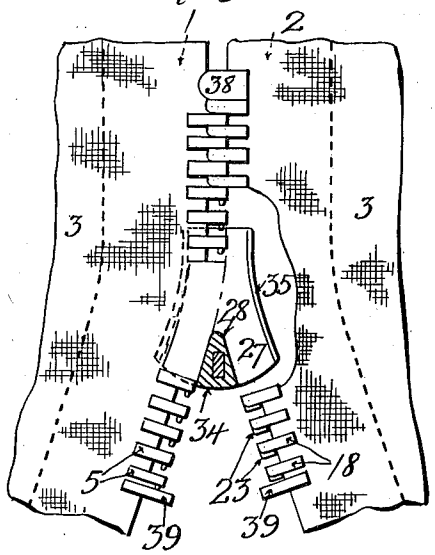


Fig. 3.

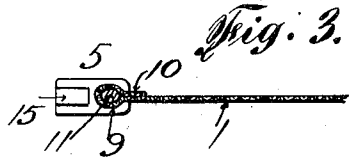


Fig. 4.

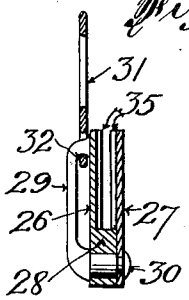


Fig. 5.

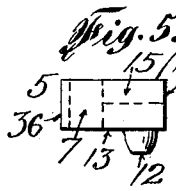


Fig. 6.

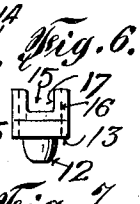


Fig. 7.

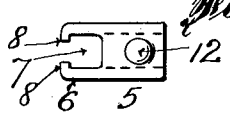


Fig. 8.

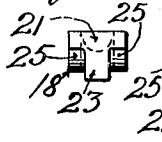


Fig. 9.

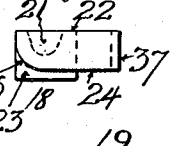
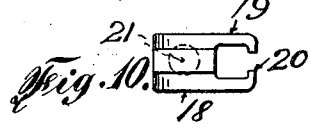


Fig. 10.



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UNITED STATES PATENT OFFICE

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FASTENER

Application filed May 12, 1927. Serial No. 190,782.

Our invention relates to that type of fastener which consists of strips adapted to be attached along the meeting edges of sheets of fabric, leather or other pliable material; and in which a double row of interlocking members are adapted to be brought into locking engagement and to be disengaged, by a sliding member. There have been a number of fasteners of this type proposed, and several have been put on the market. The object of our present invention is to improve the construction and operation of such devices by providing interlocking members which will more firmly prevent dislocation and separation of the edges of the material which are to be closed by the device. Another object is to provide a fastener of this type in which the interlocking members will move into locking position smoothly and without resistance, and which may be disengaged also without resistance, so that the sliding member may be operated quickly and smoothly. The present construction not only embodies interlocking members having projections and corresponding indentations to prevent separation of the edges of the material to which the parts are attached, in the plane of such materials, but there are also flanges on certain of the members and corresponding grooves or slots in other members which interlock and resist displacement of the fastener parts at right angles to the plane of the materials to which the fastener is attached. Another object of the invention is to provide a fastener of the type described which completely closes the edges of the fabric to which it is attached, so that there will be no spaces through which air, mud or other materials might pass. Fasteners of this type are employed for a great many uses, one of which is to close the front opening of overshoes, and it is an advantage to have a fastener which will form a more complete closure between the edges of the fabric than the devices heretofore used. Other objects and advantages will appear in the following detailed description of our invention.

In the drawing forming part of this application,

Figure 1 is a face view of our invention showing the same in closed position.

Figure 2 is a similar view showing the fastener in the process of being opened,

Figure 3 is a sectional view through one of the separate units of the fastener and is taken on the line 3—3 of Figure 1,

Figure 4 is a sectional view taken on the line 4—4 through the slider or locking member,

Figure 5 is a face view of one of the interlocking members of the device showing the same on an enlarged scale,

Figure 6 is an end view of the same part,

Figure 7 is an edge view of the same part,

Figure 8 is an end view of one of the locking members which is opposed to those shown in Figures 5 to 7, and also showing the same on an enlarged scale,

Figure 9 is a side elevation of the same member as is shown in Figure 8, and

Figure 10 is an edge view of the same member.

The fastening device is shown in the drawing as attached to and constructed with two strips of fabric or tape 1, 2 which may be attached adjacent the meeting edges of the fabric 3 where the same is to be closed by the fastener, and these strips or tapes may be attached to the fabric by stitching or by any other means. It will be understood that the fabric 3 may be any textile fabric, leather, or any other pliable material in which meeting edges are to be closed by the present type of fastener.

The edges of the fabric 3 which are to be closed or connected together by the fastener may be cut on a straight line, as shown in the drawings, or may be formed on a curved line, in which latter case the tapes 1, 2 will be attached to the fabric to correspond with the shape of the edges, all of which may conform to the present practice in the art. The interlocking members are applied in two separate rows to the opposed edges of the strips or tapes in parallel relation, the locking members on one tape being staggered in relation to those on the opposite tape, so that one set will enter the spaces between the locking members of the opposite strip. Whereas in

most prior devices the locking members on the separate strips have been exactly alike, in the present case the locking members on one strip are different from those on the other strip, and for convenience in designating the different locking members we will refer to one set as the male members, and the other as the female members, although these designations are purely arbitrary and are not intended as limiting terms. What we term the male members are those attached to the strip or tape 1 and which lie to the left in Figures 1 and 2, and which are shown in detail in Figures 5, 6 and 7; whereas, the members which we term the female members are those which are attached to the strip or tape 2, which lie to the right in Figures 1 and 2, and which are shown in detail in Figures 8, 9 and 10.

We have shown both the male and female members united to the tapes in the same manner. In Figures 5 to 7 we have shown small plates or blocks 5 constituting the male members, and these are provided at one end with parallel arms 6 having an opening 7 between them and the ends of these arms are provided with opposing prongs or projections 8 which extend inwardly at opposite sides toward each other, and which partially close the end of the space 7 between the parallel arms 6. The material or fabric of which the tape 1 is composed is provided with a hem 9 along one edge, formed by folding over the material and stitching it along the line 10 and in the hem is included one or more cords 11 serving as a filler and extending lengthwise of the tape and constituting means for the locking members to engage to hold them in alignment and laterally spaced adjacent the edges of the tape.

The members 5 are all duplicates of each other, so that a description of one will answer for all. Each of these has a projection 12 on one side or face 13 and preferably, but not necessarily, the projection is of circular form and extends outwardly from the side 13 of the member, or at right angles to the longitudinal line of the member. On the side 14 of the member 5 opposite the projection 12 there is a slot 15 extending inwardly from this side edge and extending from the front end 16 of the member backwardly; and, preferably, to the opening 7. This slot is shown as defined by substantially rectangular walls 17 although the particular shape of the slot may be varied without departing from the scope of our invention. The members 5 are all arranged upon the tape 1, so that they lie spaced from each other in parallel relation, when the tape is straight, the spacing between the several members corresponding with the width or thickness of the several female members to be hereinafter described. The cord 11 enclosed in the hem of the tape 1 is flexible or pliable and it passes through all of the openings 7 in the several members 5 after which the arms 6 are compressed to cause them to grip the cord enclosed in the opening 7 so that the members 5 remain in their proper spaced relation on the cord and lie in parallel relation when the cord is in a straight line; but their free ends, or the ends projecting away from the cord, diverge from each other when the cord is curved.

The opposing members of the fastener are shown in Figures 8 to 10. These comprise small blocks 18 which also have arms 19 corresponding with the arms 6 of the first described members; and these also have opposed projections 20 for engaging around the cord 11 which is secured in the hem of the tape 2 in the same manner as the cord in the first described tape. Each member 18 has a recess 21 in its side face 22 corresponding in size and shape with the projections 12 of the members 5; and these recesses are oppositely disposed to the projections 12; for the purpose to be hereinafter described. In addition, the members 18 each have a projecting member 23 extending from the side 24 of the member in the form of a guiding rib which is preferably of less width than the member 18 itself. In the preferred construction these projections 23 are of such size and shape as to easily slide within the slots 15 of the members 5. The members 18 are rounded off on the ends as shown at 25 at each side of the projections 23. All of the members 18 are mounted on the cord 11 of the tape 2, so that they lie in parallel relation when the cord is straight, but they are adapted to diverge when the cord is curved.

In order to cause the engagement or disengagement of the rows of fastening members we have provided a slider comprising parallel plates 26, 27 connected together at one end by a post 28. The plate 26 has an extension forming a bar 29 which extends lengthwise of the plate 26 in spaced relation to it, and the opposite end of this bar is passed through an aperture in the post 28 so that the end projects through the opposite side of the slider, and is turned over or riveted, as shown at 30. The slider is of gradually increasing width, starting from a straight portion 33 at one end opposite the post 28 and diverging or increasing in width towards the end 34. At the sides of the two plates 26, 27 there are laterally extending flanges 35 the flanges of one plate being opposed to and in line with the corresponding flanges of the other plate. When the parts are in assembled position the plates 26, 27 engage on opposite surfaces of the two rows of fastening members 5, 18, the post 28, which is tapering in width, lying between the rows of these fastening members; and the flanges 35 of the plates lying outside of the ends 36, 37 of the several fastening members 5, 18. Adjacent one end of the rows of fastening mem-

bers the tapes 1, 2 are permanently secured by a stop member 38 which limits the movement of the slider in one direction; and adjacent the opposite ends of the rows of fastening members there are stop members 39 projecting beyond the ends of the fastening members, and these are of such length that they cannot pass through the slider between the post 28 and the flanges 35 so that they serve as stops to limit the movement of the slider in one direction.

The fastening members 18 when the tapes are united as shown in Figures 1 and 2 of the drawing, are in line with the spaces between the several fastening members 5; and likewise the members 5 align with the spaces between the fastening members 18. The slider is provided with a finger piece 31 having a loop 32 engaging between the bar 29 and the plate 26 where it is adapted to slide from one end of the bar to the other according to which direction the slider is moved by the finger piece.

In operating the device, the slider is moved to the position shown in Figure 1, at which time the several fastening members of the two rows will be interlocked to retain the edges of the tapes 1, 2 close together, and therefore the opening of the fabric to which these tapes are secured will be held closed. To open the device the slider is moved toward the top of the view in Figure 1 and in Figure 2 it is shown in the process of being so moved. The slider, as such, operates in a manner similar to sliders of this character previously employed in the art. As the slider is moved to close the fastener, the fastening members on the opposite tapes are moved toward each other by the divergent flanges 35 of the slider, and the several members 18 approach the spaces between the members 5 at an angle so that the ends of the projections 23 enter the slots 15; and the projections 12 enter the recesses 21. As the slider progresses from the point where this entering action takes place, the projection 12 finally is fully seated in a recess 21 and the guiding projection 23 extends some distance into the slot or groove 15, until the opposing members 18, 5 rest against each other as shown in Figure 1. When the device is to be opened and the slider is moved in the reverse direction, the post 28 forces the cords 11 apart, or causes them to bend, so that the members 18 and 5 swing into angular relation; and while thus moving, the projection 23 of the members 18 successively withdraw gradually from the slots 15 of the members 5 and the projections 12 swing out from the recesses 21 until the opposing members are disengaged, whereupon they may separate to any extent. During the engaging and disengaging action of the opposed members, the projection 23, moving in the grooves 15 serve to keep the opposed members in alignment or in the same plane, and act as a guide, while the projections 12 are entering and leaving the recesses 21. When the device is in closed position these projections and grooves co-operate not only to prevent lateral displacement between the rows of fastener members, but they also close the spaces between the tapes, so that the device forms a more complete closure than with slide fasteners as heretofore made. While the opposed members are swinging into or out of locking relation with each other, the curved corners 25 co-operate with the edges or corners of the members 5 to facilitate the movement of the parts, and to cause a free sliding motion between the opposite locking members. This results in a very smooth operation of the device, so that the slider may be moved with the least resistance.

Having described our invention, what we claim is:

In a device of the class described, a plurality of strips having fastening members attached to said strips in staggered relation whereby the fastening members of one strip may project into the spaces between the fastening members of the other strip, one set of fastening members having laterally projecting members on one side thereof and having lengthwise slots in the side opposite said projections, said slots extending inwardly from the free ends of said members, the other set of fastening members having on one side edge thereof depressions to receive said projections of the first mentioned fastening members in locking engagement therein, and having on their opposite side edges, laterally extending projections extending inwardly from their free ends, said projections being adapted to slide and be guided in said slots of said first members and to close the spaces between said first and said second fastening members, and a slider for engaging and disengaging the sets of fastening members.

Signed at the city of New York, county of New York and State of New York, the 30th day of April, 1927.

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