

W. R. WILLETTS.

SNAP FASTENER.

APPLICATION FILED JAN. 25, 1915. RENEWED APR. 3, 1917.

1,229,562.

Patented June 12, 1917.

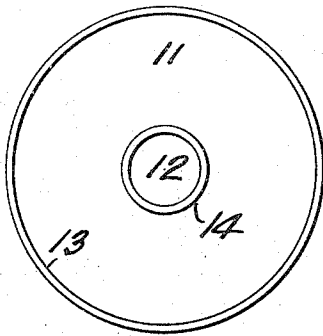


FIG. 1.

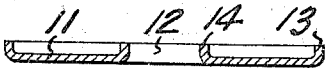


FIG. 2.

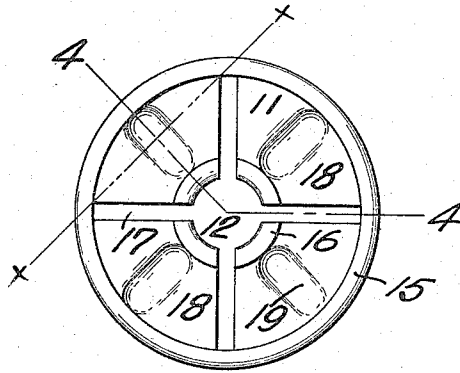


FIG. 3.

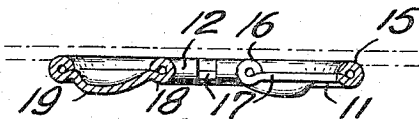


FIG. 4.

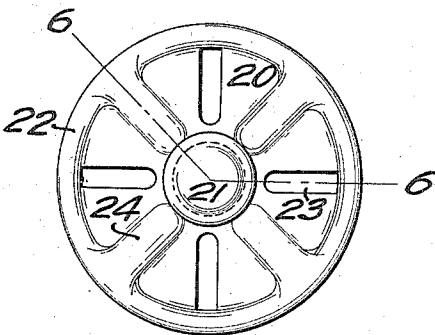


FIG. 5.

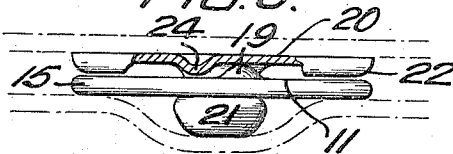


FIG. 6.

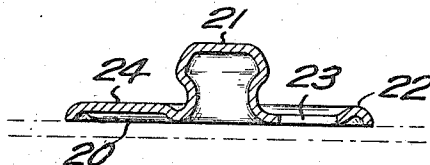


FIG. 7.

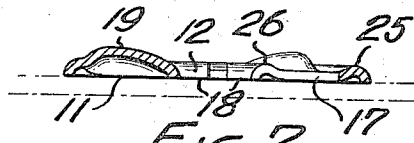


FIG. 8.

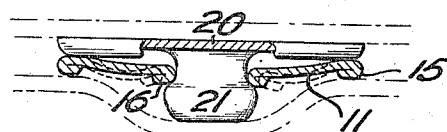


FIG. 9.

Witnesses

G. M. Moreland

Inventor

W. R. Willetts
by *Litherton & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM R. WILLETTS, OF MONTREAL, QUEBEC, CANADA.

SNAP-FASTENER.

1,229,562.

Specification of Letters Patent. Patented June 12, 1917.

Application filed January 25, 1915, Serial No. 4,208. Renewed April 3, 1917. Serial No. 159,564.

To all whom it may concern:

Be it known that I, WILLIAM R. WILLETTS, a citizen of the United States of America, and resident of the city of Montreal, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Snap-Fasteners, of which the following is a full, clear, and exact description.

10 This invention relates to improvements in fastening devices of the class commonly designated sew-on snap fasteners, and the primary object of the invention is to provide a fastener which will retain its initial fastening powers indefinitely.

A further object is to provide a fastener of such simplified construction that it may be manufactured and sold at a very low cost.

20 A still further object is to provide a fastener which may be more easily attached to the garment by sewing than those at present in general use.

25 Various other objects and advantages will be apparent from the following description.

The device consists as usual of male and female members, each of which is radially slotted and radially ribbed intermediate the slots. In the male member, the slots are merely for sewing on, but in the female member the slots are primarily to divide the member into a plurality of spring fingers, and serve the secondary purpose of sewing on apertures. The ribs are for the purpose of stiffening the members, but in certain forms of the device may have an additional function as disconnecting means. The female member consists essentially of a single flat sheet of metal centrally apertured for the passage of the male member and slotted and ribbed as previously described.

In the drawings which illustrate the invention:—

45 Figure 1 is a plan view of a partially formed female member blank.

Fig. 2 is a diametric section thereof.

Fig. 3 is a plan view of the completely formed female member.

50 Fig. 4 is a section on the line 4—4, Fig. 3.

Fig. 5 is a plan view of the male member.

Fig. 6 is a section on the line 6—6, Fig. 5.

Fig. 7 is a view corresponding to Fig. 4, showing a slightly modified form.

Fig. 8 is an elevation of the male and female members together, illustrating the operation of the ribs as disconnecting means.

Fig. 9 is a sectional view showing a slightly modified form of the female member.

Referring more particularly to the drawings, 11 designates a metal disk provided with a central aperture 12, reducing it to annular form. The outer and inner peripheries of the ring are turned up to form flanges 13 and 14, which are subsequently bent down on the body of the plate to form thickened rims 15 and 16, shown in Fig. 3, *et seq.* After formation of the rims 15 and 16, a plurality of radial slots 17 are cut in the ring extending from the central opening 12 toward the outer rim 15, and dividing the material into a number of fingers 18. A suitable number of ribs 19 are stamped up from the material intermediate the slots 17. These ribs serve to stiffen the fingers and render flexion thereof more or less uniform from root to tip, the ribs being suitably formed for this purpose. Without these ribs, it is obvious that practically all the flexion in a finger would occur approximately on the line *x—x*, which is the straight line between the ends of the slots farthest from the tip of the finger. This line is crossed by the rib, as clearly shown, so that this undesirable localization of the bending is eliminated. The ribs are shown in the drawings as formed on only one side of the ring, but it is obvious that they may be formed on either or both sides, if so desired. In all these operations, great care must be taken to keep the body of the plate absolutely flat.

The male member comprises a plate 20 having a button 21 of the well known form upset at the center thereof. The edge of the plate may be rimmed over as previously described, or may be provided with a circumferential rib 22 to impart the necessary stiffness and eliminate the thin rough edge. The plate between this rib and the button is provided with a plurality of slots 23 and with a plurality of radial ribs 24, arranged intermediate the slots and preferably equal

in number with the ribs 19 of the female member. These radial ribs may be formed continuous with the peripheral rib, as clearly shown, or may be separate therefrom.

The female member may obviously be provided with outer and inner peripheral ribs 25 and 26, clearly shown in Fig. 7, in place of the bent over ribs 15 and 16, or with no rim of any sort.

The two members of the fastener are sewed on in the usual manner, using the slots as sewing-on apertures. These slots being much larger than the small holes usually provided, the attachment may be much more secure and may be effected more quickly and with much greater ease. When the two parts of the fastener are brought together, the male member is forced through the aperture 12 of the female member, flexing the fingers 18 to enlarge the aperture sufficiently for its passage, the fingers springing back under the head of the button, so that the two members are held together. This is what theoretically occurs, but as a matter of fact, the length of the spring fingers is so little compared with the amount of their flexion, that a certain straining or permanent deflection occurs. This feature is very noticeable in some types of fasteners in which the fastening and unfastening movements cause repeated flexion of the spring parts in the same direction, with the result that the permanent deflection gradually increases until the grip is so slight that the fastener is useless. This feature, while it may not have been admitted in so many words, is proven by the constant search for means to lengthen the spring parts. In the present invention, it is recognized that even with the maximum length of spring portions practicable, certain permanent deflection is bound to occur. This is counteracted by the use of an absolutely flat plate for the female member. It is obvious that the fingers of this member must be flexed an equal amount in the opposite direction when the male member is withdrawn, and it will be very clear that this equal flexion in the opposite direction will produce certain permanent deformation which corrects the permanent deformation arising from flexion in the opposite direction. The deformation produced at each deflection is so minute that a very slight correction is all that is necessary to keep the fingers all absolutely flat, and will not produce crystallization of the metal during the life of the fastener. It will therefore be seen that the fastener will retain its efficiency until the grip is lost by reason of actual wear of metal from the ends of the fingers and the head of the button.

It has been found that in practice many

fasteners are separated at one side before the other, generally by pulling on the two connected layers of fabric. This method of disconnection causes unequal flexion of the fastener spring members and soon ruins the fastener, and in addition is a very great strain on the fabric and attachment of the fastener, if the fastener is at all tight. With very few exceptions, this method is necessary as no means is provided for releasing the fastener. In the present invention, this disadvantage may be overcome by forming the ribs 19 and 24 of the male and female on adjacent faces, so that when the fastener parts are connected, the ribs will intermesh. A very slight relative revolution of the fastener parts in opposite directions will cause these ribs to ride over one another and force the two members apart, at the same time maintaining them in parallel planes, so that no damage is done the fingers. Even if this action is accomplished by tension of the fabric carrying the fasteners, the damage thereto will be much less than usual owing to the wedge action of the ribs riding over one another, which takes much less force to operate than is required for the ordinary forcible separation of fastener parts.

It is of course obvious that the female member may be very slightly dished and retain very largely the advantages of the flat member. The dishing should, however, be of a conical nature rather than spherically curved, since if there is spherical curvature, the insertion or removal of the fastener produces an increase of such curvature, such as shown in exaggerated form in Fig. 9, which movement cannot be corrected by the return movement of the male member. The advantages of the fastener previously pointed out have been those which concern the user. There is the additional advantage that the fastener is a two piece article of extreme simplicity, requiring a minimum of material, so that it may be manufactured easily and at a very low cost.

While certain forms of the invention have been shown, it is obvious that numerous modifications and combinations of these forms may be made, and also that the same principle may be applied to rivet-on fasteners without departing from the spirit of the invention.

Having thus described my invention, what I claim is:—

1. A one piece female member for snap fasteners, comprising outer and inner thickened peripheral rims inclosing a flat body portion, a plurality of resilient male member gripping fingers formed by cutting slots through the inner rim and the body clear to the outer rim and integral ribs struck up radially on each finger extending between the inner and outer rims and tapering in

depth from adjacent the outer rim sharply toward the outer rim and gradually toward the inner rim.

2. In a snap fastener, male and female members engageable by movement toward one another, and intermeshing means carried by said member arranged to disengage the members upon relative revolution thereof.

3. In a snap fastener, male and female members engageable by movement toward one another, integral radially disposed ribs formed on adjacent faces of said members and arranged to intermesh during engagement of the fasteners, and formed to engage and separate the fastener members upon relative revolution thereof.

4. In a snap fastener, male and female members, the female member having male member engaging portions flexible equally in opposite directions by the insertion and removal of the male member, and interengaging means carried by the male and female members operable by relative revolution of the members to separate the same, and uniformly flex the male member engaging portions of the female member.

In witness whereof, I have hereunto set my hand, in the presence of two witnesses.

WILLIAM R. WILLETTS.

Witnesses:

HARRY WILLETTS,
FRANK S. WALLACE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."