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P. A. ARONSON

1,786,978

SEPARABLE FASTENER

Original Filed June 14, 1923

Fig. 1.

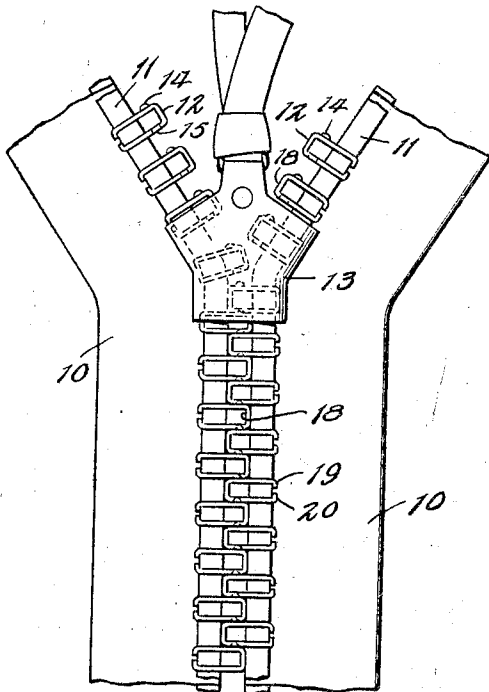


Fig. 3.

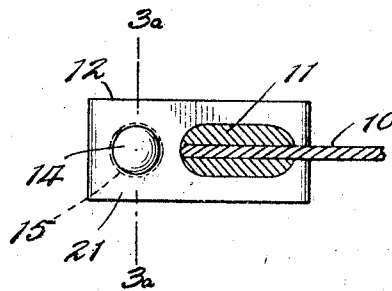
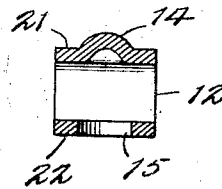


Fig. 4.

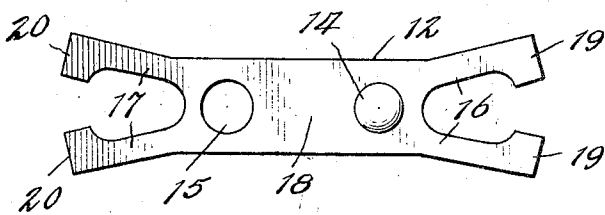


Fig. 2.

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SEPARABLE FASTENER

Original application filed June 14, 1923; Serial No. 645,223, and in Great Britain June 6, 1924. Divided and this application filed May 19, 1928. Serial No. 279,152.

This invention relates to separable fasteners of the slider controlled type and is a division of my copending application Serial No. 645,223, filed June 14, 1923 (Patent 1,671,921, issued May 29, 1928).

An object of the invention is to provide a novel construction of cooperating interlocking members to facilitate engagement and disengagement without coming apart under transverse strain.

Other objects of the invention are to enable compressible jaw members having interlocking projection and recess portions to be made of flat strip material without requiring buffing or other finishing operations after the fastener members are set on the stringers; to construct such members so as to require a minimum number per unit length of tape; and to provide an improved holding power and slider guiding means on the corded edge of the tape without cutting either the cord or tape.

According to a feature of the invention, the individual locking members are made of flat strip material having on one side a round projection and on the opposite side a substantially larger circular recess or socket. The projection and recess are located one above the other in substantial alignment and are preferably set in from the edges of the locking member. The locking members are mounted in staggered relation on the abutting edges of the closure so that when brought together the free ends of the members will overlap with the projections of one series engaging the recesses of the opposite series.

The cooperating projections and recesses are also formed so that they will not coincide closely with each other when engaged, but will permit the projections to move up and down and laterally inside the recesses without coming apart. One of the engaging portions of each member, preferably the projection, is semispherical in shape, while the other engaging portion, preferably the recess, is substantially cylindrical. In the particular construction illustrated herein, the recess is made open at both ends, instead of providing a top wall or roof as heretofore.

When the fastener is subjected to transverse strain when engaged the projections will ride up inside the recesses and thus cumulatively increase the locking effect. The relative inclination between the semispherical projections and the substantially cylindrical recesses tends to promote this action and also provides the required facility of movement between the members in locking and unlocking without permitting them to come apart under transverse strain.

In the particular form of the invention shown herein for purposes of illustration the individual locking members are made from successive pieces of wire of generally flattened cross section by being cut off to the desired length, then bent up after being stamped or perforated to provide a shell type of member having separated pairs of compressible jaws for clamping to a tape, an oppositely disposed recess and projection, a bridging element connecting the spaced pairs of jaws, and slider guiding means formed by bending the end portions of the jaws toward each other to lie along the tape substantially parallel to its edge and forming a track on which the slider moves.

Referring to the drawing:

Fig. 1 is a plan view of a partially closed fastener having locking members embodying the invention;

Fig. 2 is a developed plan view of one of the locking members shown in Fig. 1 before being bent;

Fig. 3 is a cross-section taken on the line 3a-3a of Fig. 4; and

Fig. 4 is a top plan view showing one of the locking members clamped in position on a tape.

In the drawing, the stringers 10, preferably of woven tape, for example, have sewed thereto on opposite sides, braided or twisted cords 11 to form a beaded edge to which are secured a plurality of locking members 12 alternately arranged on the tape and adapted to be controlled by the slider 13.

Each member 12 is formed from a piece of flat wire or strip metal bent back on itself in a general U, hollow shell or rectangular shape provided with interlocking portions,

comprising a projection 14 stamped or bent up on one side and a recess or socket 15 stamped on the opposite side, with which the opposed locking members cooperate. The projection 14 is set inwardly from the edges of the locking member and the recess or socket 15 is also set in from the edges of the member in substantial alignment with the projection.

The flat blank from which the locking members are formed has substantially parallel longitudinal edges and jaws 16 and 17 connected by a bridging element 18. The members are formed by stamping out the metal occupied by a cross-section of the corded edge of the stringer, spreading the jaws as shown in Fig. 2 in order to receive the edge of the tape, and then clamping the jaws to the stringer by compression as shown, for example, in Fig. 4.

The end portions 19 and 20 of the jaw members are extended and bent toward each other to lie along the stringer, as shown in Fig. 1, so that they lie substantially parallel to the corded edge 11 and provide a track along which the slider travels. This construction of the slider guiding means does not stiffen the fastener because the ends 19 and 20 which are bent toward each other occupy only the space between the upper and lower sides of the locking member. The surface 21 adjacent the projection 14 and the surface 22 adjacent the recess 15 are substantially flat, and may rest one upon the other when the fastener is closed. However, the locking members may be spaced apart on the stringers a sufficient distance so that the surfaces 21 and 22 will not actually contact.

The recess 15 of each locking member is substantially larger than its projection 14, as shown in Figs. 3 and 4. The projection 14 is preferably semispherical in shape, while the recess or socket 15 is preferably cylindrical with straight walls substantially perpendicular to the plane of the clamping jaws and flat surface 22. Although a cylindrical surface in the recess is preferred it will be observed that any other surface composed of straight line elements may be used. Although not essential to the invention the recess or socket 15 is shown as being open at its upper end as well as its lower end. Due to the relative size and contour of the projections 14 and recesses 15 of the cooperating locking members these locking portions will not coincide or fit closely when engaged. The semispherical projections may move up and down as well as laterally when inside the cylindrical recesses of cooperating members, resulting in less friction than when the projections and recesses fit snugly. In locking and unlocking, the rounded surfaces of the semispherical projections will rise easily over the edges of the cylindrical recesses, and when engaged the projections may move inside the recesses

without coming apart. When the closed fastener is subjected to transverse strain the cooperating locking members tend to ride one on the other and thus cumulatively increase the locking effect due to the inability of the members to longitudinally separate at their rear ends where attached to the stringer. The strain at the back due to the riding at the front is taken up by slight tension on the tape between the members.

The degree of flexibility of the fastener may be varied by changing the dimensions of the locking members longitudinally of the stringers. The number of locking members per unit length of tape may be easily varied by changing the dimensions of the rectangle into which the metal strip is bent. This is advantageous because for some uses a maximum number of locking members per unit length with increased flexibility is desirable, while for other uses a minimum number of such members and relative stiffness of the fastener is desirable.

Where the locking members are of the hollow type with a considerable space between the jaws 16 and 17, it may be desirable to use one or more overlapping flaps, as illustrated, for example, in Fig. 5 of Patent #1,432,219 to Sundback, dated October 17, 1922, to prevent granular or other material from passing through the locking members and leaking out of the container or whatever the fastener is applied to. The invention, however, is not limited to a construction having two pairs of clamping jaws with a space between them, or to a hollow shell locking member, since the flat sides or faces of the locking members may be formed together with little or no space between them. Various other changes may also be made in the details of construction herein shown and described without departing from the scope and spirit of the invention as defined in the appended claims.

I claim:

1. A locking member for a separable fastener having a portion cut out to provide clamping jaws, a semispherical projection on one side of said member and a substantially larger circular recess on the opposite side of said member to loosely receive the projection of a similar locking member.

2. A locking member for a separable fastener having a portion cut out to provide clamping jaws, a semispherical projection on one side of said member set in from the edges thereof, and a substantially larger circular recess on the opposite side of said member in alignment with said projection to loosely receive the projection of a similar locking member.

3. A locking member for a separable fastener comprising means for securing same to a tape, a semispherical projection on one side

of said member, and a cylindrical socket in the opposite side of said member.

4. A locking member for a separable fastener comprising means for securing same to a tape, a semispherical projection on one side of said member, and a substantially larger cylindrical socket in the opposite side of said member.

5. A locking member for a separable fastener comprising clamping jaws for attachment to a tape, a semispherical projection on one side of said member well in from the edges thereof, and an aligned recess on the opposite side of said member also spaced from the edges thereof and substantially larger than said projection to permit rocking movement of the projection of a similar locking member therein.

6. A separable fastener comprising a pair of flexible stringers having opposed series of spaced locking members, certain of said members having semispherical projections and others of said members having substantially larger circular recesses to loosely receive said projections.

7. A separable fastener comprising a pair of stringers having interlocking members with a portion cut out to provide clamping jaws, each of said members being provided with a semispherical projection and a recess having walls substantially perpendicular to the plane of said jaws.

8. A separable fastener comprising a pair of stringers having interlocking members with a portion cut out to provide clamping jaws, each of said members being provided with a semispherical projection and an aligned recess having walls substantially perpendicular to the plane of said jaws.

9. A locking member for a slide type fastener comprising a strip of material bent to provide pairs of clamping jaws, a recess adjacent one and a projection adjacent the other pair of jaws, and a bridging element connecting said pairs of jaws, the projection being semispherical in shape and the recess being stamped out and having walls substantially transverse to the plane of the jaws.

10. A locking member for a slide type fastener comprising a strip bent to provide pairs of jaws for clamping the member to a tape, a projection adjacent one pair and a recess adjacent the other pair of jaws, a bridging element connecting said pairs of jaws, and slider guiding means formed by bending the end portions of said strip toward each other to lie along said tape substantially parallel to its edge.

11. A locking member for a slide type fastener comprising a strip of material bent to provide a bridging element, jaws for clamping said member to a stringer, and a semispherical projection and a recess adjacent the bend on opposite sides of said bridging element.

12. A locking member for a slide type fastener comprising a flat strip of material bent in the middle having ends provided with compressible clamping jaws for clamping same to a tape, the end portions of said jaws being bent toward each other to lie along said tape substantially parallel to its edge, and a projection and recess in substantial alignment on opposite sides of the bend and set in from the edges of said member.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 17th day of May A. D. 1928.

PETER A. ARONSON.

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