

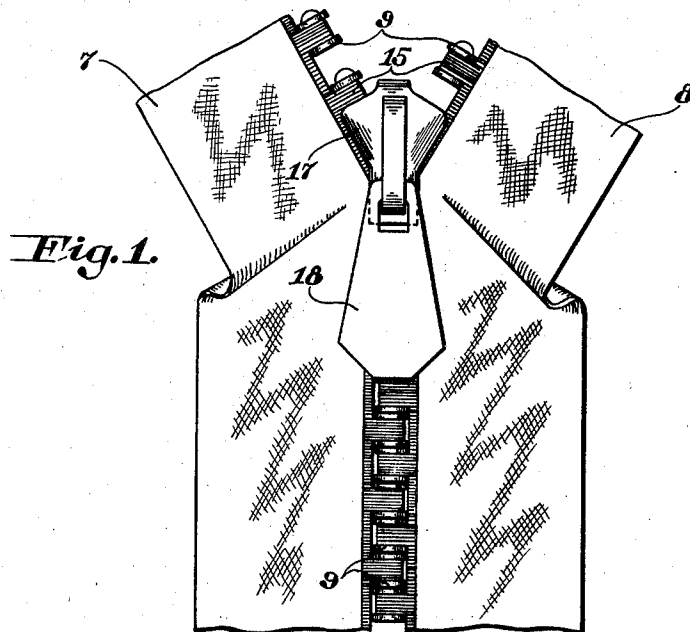
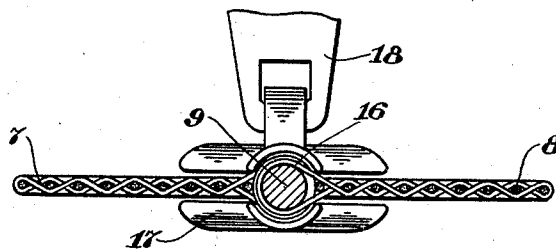
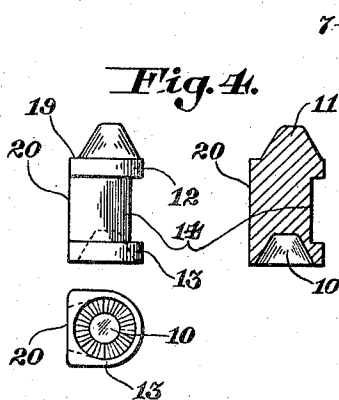
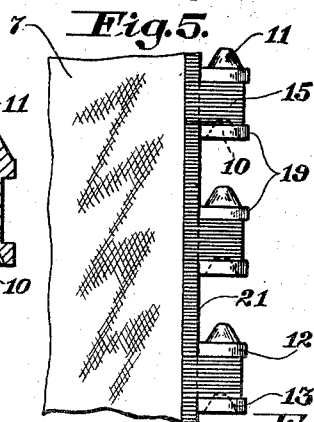
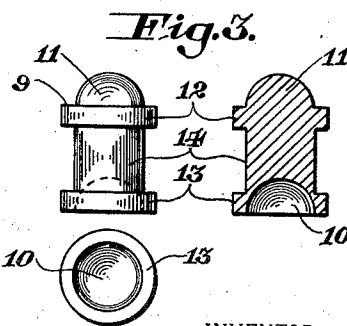
Aug. 8, 1939.

F. D. BANNING

2,168,598

SEPARABLE FASTENER

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INVENTOR.

Frederick D. Banning

BY

Kelley & Chisholm.
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,168,598

SEPARABLE FASTENER

Frederick D. Banning, Meadville, Pa., assignor to
Talon, Inc., a corporation of Pennsylvania

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My invention relates to separable fasteners of the general class known as slide fasteners or "zippers". In nearly all of the fasteners of this type which have been on the market, the fastener elements are provided with jaws or arms which extend around the edge of the flexible stringer. An example of this type of fastener construction is shown in Patent No. 1,219,881 to Sundback. The interlocking portions of the fastener are only those portions which extend beyond the edges of the tapes or between the edges of the tapes when interlocked and which have interfitting projections and recesses. The greater part of the fastener element is taken up by the jaws which extend over or around the edges of the tapes. The structure of Marinsky Patent Reissue No. 18,406, dated April 5, 1932, is an example of a fastener in which a two ply tape has apertures through which the fastener elements project.

The fundamental object of my invention is to do away with the extending jaws or arms and make the fastener elements of only such size as necessary to carry the proper interlocking devices. This result is not accomplished by such a structure as shown in the Marinsky patent, because in that structure there are the equivalents of the extending jaws in the portions of the wires which extend around the cord.

In carrying out my invention I preferably have flexible portions of the stringers themselves extending around the body of the fastener elements between the projections and recesses so that the elements can be arranged wholly between the edges of the ribbon-like stringers or tapes. In one embodiment of my invention the elements may be said to be woven into the edge of the tape.

In the accompanying drawing I have shown for purposes of illustration a preferred embodiment and a modification thereof. In the drawing:

Fig. 1 is a front view of a portion of a fastener in accordance with my invention;

Fig. 2 is an enlarged cross-sectional view through the same fastener;

Fig. 3 shows various views of an individual fastener element;

Fig. 4 shows similar views of a modified form of fastener element;

Fig. 5 is a plan view showing a stringer with the modified form of elements; and

Fig. 6 is a cross-sectional view through the stringer showing the modified form of element.

In the fastener illustrated there are a pair of flexible stringers herein single ply fabric tapes 7, 8 and along the adjacent edges of the tapes are the fastener elements generally designated 9.

These elements are arranged in uniformly spaced relation and staggered on the opposite stringers so that the elements on one series will fit between the elements on the opposite series. As best illustrated in Fig. 3 almost the entire end areas of each element are taken up by a concavity 10 on one end and a convexity 11 on the other end, which cooperate with and fit into correspondingly shaped portions on the opposite stringer. Each of the elements is of generally cylindrical form and extends lengthwise in the same direction as the fastener. Each element is provided with flanges or shoulders 12, 13 which define a circumferential groove 14 between them extending around the middle portion of the fastener element. The elements in the interlocked position of the fastener are arranged wholly between the edges of the tapes and no portion extends over or around these edges corresponding to the gripping arms of the usual fastener element.

The elements are held in place by suitable holding means on the tape, preferably of a flexible nature and passing around the groove 14. In the embodiment illustrated this holding means takes the form of bunched cross-threads which are extended laterally to project from the edge of the tape as indicated at 15. In the weaving of these tapes the elements are held in place and the tape is woven with the cross-threads extending around the element as illustrated. One of these cross-thread extensions can be plainly seen at 16 in Fig. 2. A slider 17 is mounted to slide on the flanges 12, 13 so that it embraces the extending portion 15 of the cross-threads but is supported out of contact with them so that the flanges of the slider will not break the threads.

The slider may be of any convenient form and will not be further described except to say that it is actuated along the stringers by a pull tab 18.

In the modification illustrated in Figs. 4 and 5 the elements 19 are also of the form generally resembling a cylinder but having one flat side which is placed against the perpendicular edge 21 of the tape. In such a structure the element will be prevented from turning relative to the tape and another advantage is that outer square shoulders are provided for engagement with the slider. This structure may be more desirable for heavier applications where considerable strain is placed upon the slider in closing the fastener.

The elements may be readily manufactured from metal or a suitable plastic material in any known manner. For example, they may be machined or molded to shape. Their size and spacing on the tape may be varied to suit conditions.

Where extreme flexibility and refinement are desired the elements may be made short and spaced close together but where there is required a cheaper fastener which need not be so flexible, the elements can be somewhat longer and correspondingly further apart.

The advantages of the novel form of fastener herein disclosed will be readily apparent from the above description and the accompanying drawing. The line of fastener member material which is visible along the center of the fastener is considerably narrower than that of the usual fastener. The cost of the fastener member is considerably reduced because for a given size of the interlocking devices only about half as much material will be required. This is a considerable factor in the cost of fasteners, especially when they are made from some of the plastics. It will be seen that my improved fastener in addition to being relatively inconspicuous has no sharp corners which might tend to catch on the threads of clothing. Other advantages will be apparent to those skilled in the art.

While I have shown and described in this application one embodiment and a modification which my invention may assume in practice, this embodiment and modification are merely for the purposes of illustration and description and other forms may be devised within the scope of my invention as set forth in the appended claims.

What I claim as my invention is:

1. A separable fastener of the class described comprising a pair of flexible stringers, a series of separate fastener elements arranged in uniformly spaced relation along the edge of each stringer, each of said elements having a projection on one side and a recess on the other side in substantially the same longitudinal line, holding means on the tape embracing the portion of the element directly between said recess and projection for holding each of the elements in place on the stringer.

2. A separable fastener of the class described comprising a pair of flexible stringers, a series of separate fastener elements arranged in uniformly spaced relation along the edge of each stringer, each of the elements having interlocking means, and holding means extending around that portion of the element which is in the same longitudinal center line as said interlocking means.

3. A separable fastener of the class described comprising a pair of flexible stringers, each stringer consisting of a single ply flat tape, a series of separate fastener elements arranged in uniformly spaced relation along the edge of each of the tapes, each tape having cross threads integral therewith which extend beyond the edge of the flat tape and around each of the elements for holding them in place on the stringer.

4. A separable fastener of the class described comprising a pair of ribbon-like tapes, a series of separate fastener elements arranged in uniformly spaced relation along the edge of each tape, and holding means connected to the tape and extending beyond the edge thereof completely around the body portion of each of said elements for holding them in place on the stringer.

5. A separable fastener of the class described comprising a pair of flexible stringers, a series of separate fastener elements arranged in uniformly spaced relation along the edge of each stringer, each of said elements consisting of a generally

cylindrical member having a concavity on one side and a convexity on the other side constituting interlocking means adapted to cooperate with similar interlocking means on the elements of the opposite stringer, and said stringers having portions embracing each of said cylindrical members for holding them in place on the stringer.

6. A separable fastener of the class described as defined in the preceding claim, in which the cylindrical member has a circumferentially extending groove wherein the holding portions of the stringer are confined.

7. A separable fastener of the class described comprising a pair of ribbon-like tapes, cooperating series of individual fastener elements arranged wholly between the edges of the stringers and positioned against said edges, and holding means united to the tapes extending outwardly from the edges thereof and embracing each of said elements for holding it in place against the edge of its tape.

8. A separable fastener of the class described comprising a pair of flexible tapes, a series of separate fastener elements arranged in uniformly spaced relation along the edge of each of said tapes, said elements being adapted to intermesh when the fastener is closed, all of said elements being arranged wholly between the edges of said tapes in the closed position of the fastener, each of the elements consisting of an elongate body extending in the same longitudinal line as the fastener, and having interlocking means at the ends thereof, and holding means on each of the stringers surrounding the elongate body between its ends for holding it in place on the stringer.

9. A separable fastener as defined in the preceding claim in which the interlocking means consists of a concavity at one end and a convexity at the other end, each of which are substantially co-extensive with the cross-sectional area of the fastener element.

10. A separable fastener of the class described comprising a pair of flexible stringers, cooperating series of fastener elements arranged wholly between the edges of said stringers, each of said elements having a shape generally resembling a cylinder with a flat portion in contact with the tape to prevent the same from turning on the tape, and holding means on each of the stringers embracing each of said elements for holding them in place on the stringer.

11. A separable fastener of the class described comprising a pair of flexible tapes each of which is a single ply woven structure, cooperating series of fastener elements along the edges of said tapes, and arranged wholly between the edges of said tapes, each of said elements having shoulders defining a groove which extends around the element, and holding means consisting of cross threads of the tape bunched together and extending outwardly from the edge of the tape and confined within the grooves on said fastener elements for holding the elements in place on the tape.

12. A separable fastener as defined in the preceding claim in combination with a slider riding on said shoulder portions and embracing the portions of the cross threads which extend around the fastener elements but being supported out of contact with such threads by said shoulders.

FREDERICK D. BANNING.