

Feb. 26, 1952

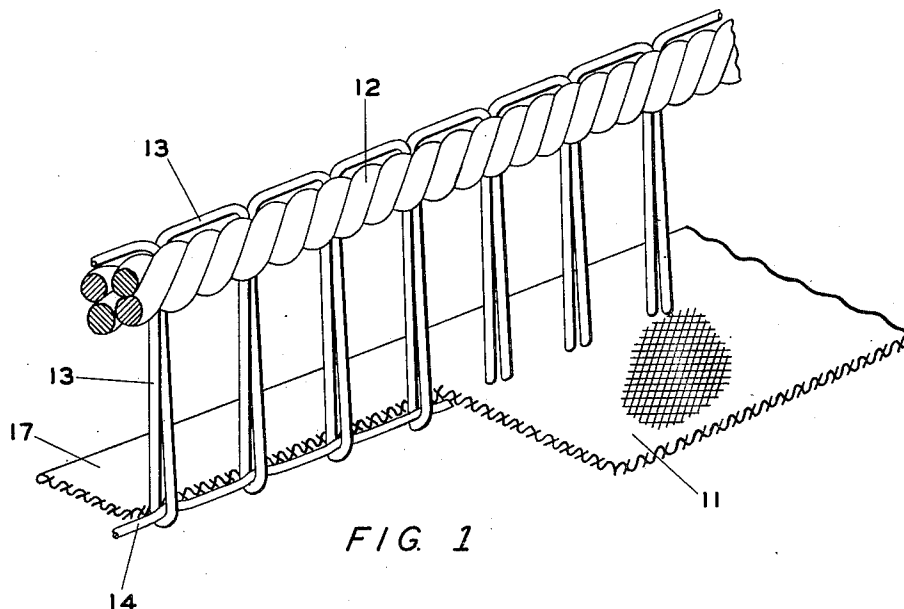
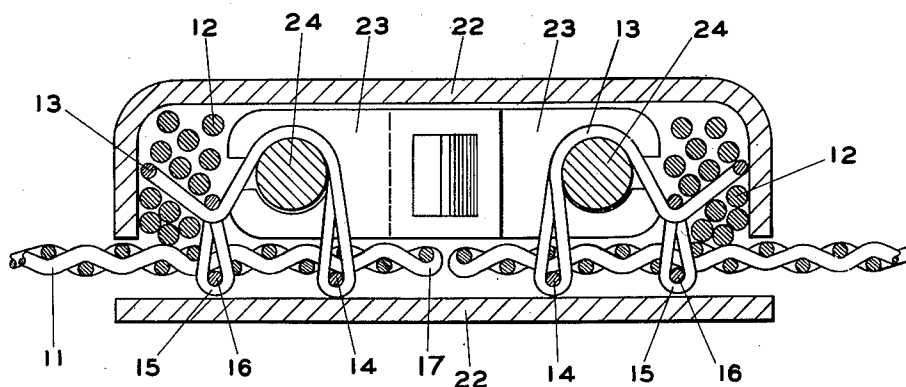
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2,586,891

SEPARABLE FASTENER ASSEMBLY

Filed July 21, 1948

4 Sheets-Sheet 1



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Feb. 26, 1952

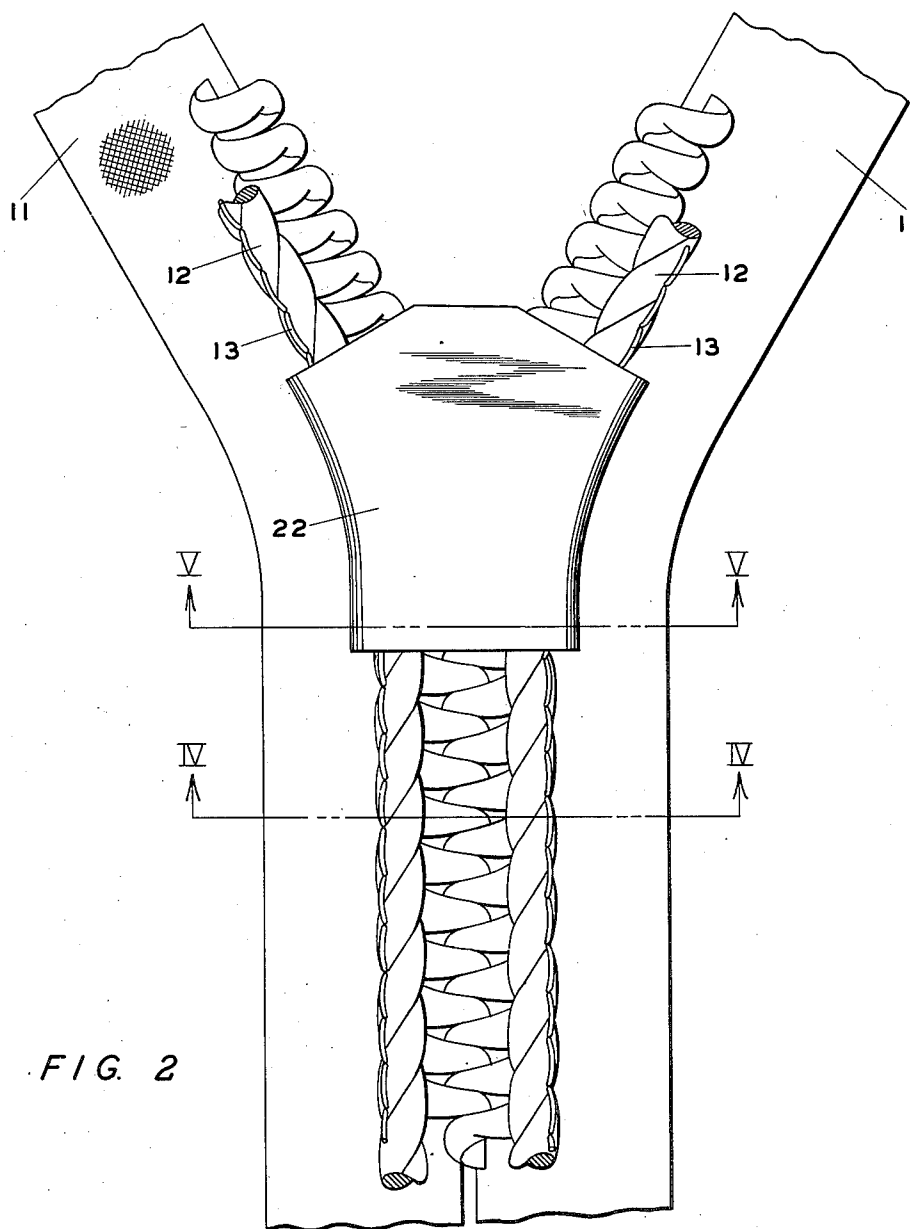
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SEPARABLE FASTENER ASSEMBLY

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4 Sheets-Sheet 2



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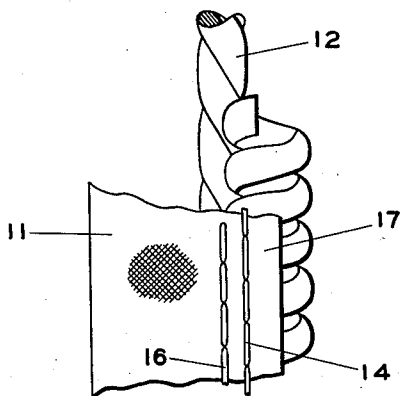
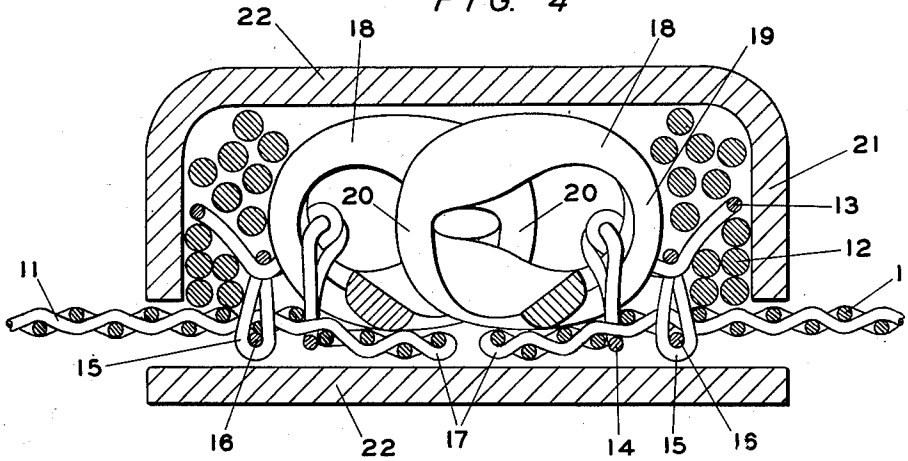
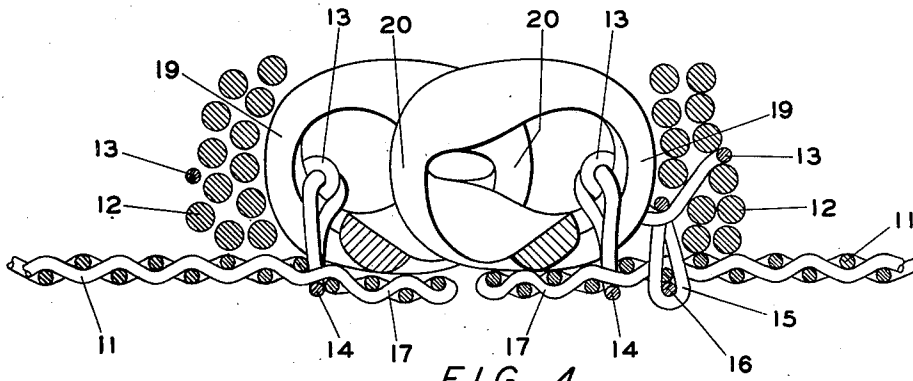
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SEPARABLE FASTENER ASSEMBLY

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4 Sheets-Sheet 3



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SEPARABLE FASTENER ASSEMBLY

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4 Sheets-Sheet 4

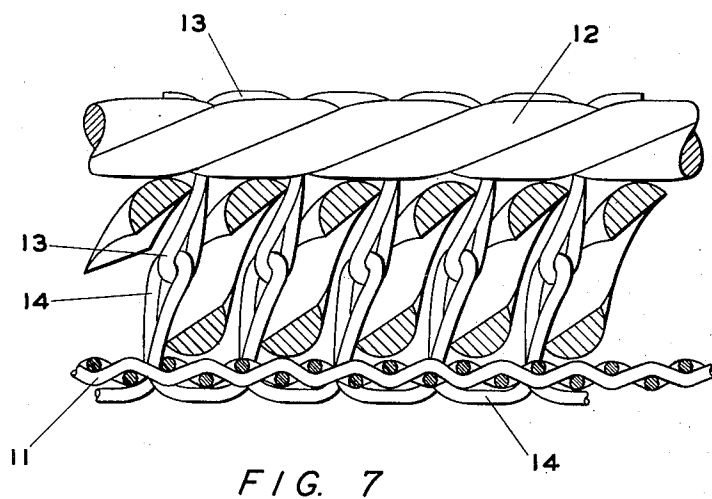


FIG. 7

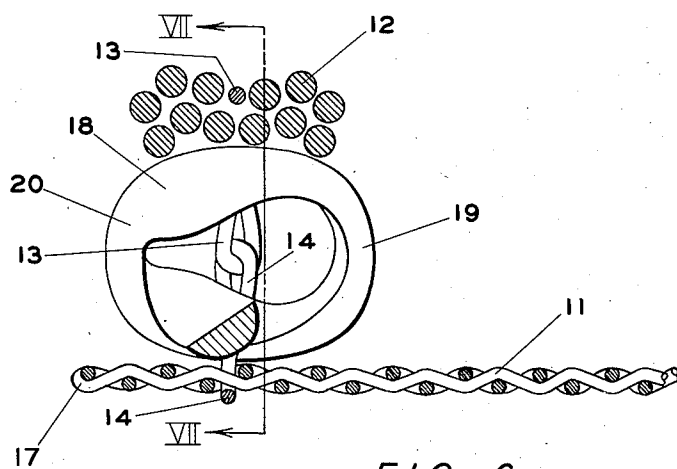


FIG. 6

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SEPARABLE FASTENER ASSEMBLY

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12 Claims. (Cl. 24—205.16)

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This invention relates to a separable fastener, particularly to a separable fastener, and to a tape useful therein, fashioned in such a way as to provide a track or bead for guiding a slider used for separably joining and for releasing the stringers of the fastener.

A number of types of separable fasteners have been devised and used widely. One type comprises, broadly, a row of individual links or engaging elements secured at regular intervals on a runner, such as a cord, which maintains regular spacing of the engaging elements, each link having hooks and eyes or other means to separably engage the eyes and hooks, respectively, of a similar row of links secured to another runner. The links and runner are assembled in a tape to form the conventional link stringer and the tape can then be sewn, or otherwise secured, to the goods to be separably joined. In some instances the links can be secured directly to the edge of the tape. A number of ways have been devised for securing individual links to a cord in accurately spaced alignment, one way consisting in fashioning the root of each individual link, i. e., the end of the link removed from the end provided with a hook and eye, in the form of a split ring so that it may be clamped onto a cord longitudinally positioned with respect to the rows of links. A number of ways have been devised for assembling a runner carrying a row of such links in a tape.

Another type of separable fastener has been devised comprising, broadly, a coil stringer consisting of a row of filament loops, which constitute the engaging elements, secured in spaced relationship longitudinally along a tape and adapted to nestle within and engage in positive interlocking fashion a row of similar, but oppositely wound, filament loops secured longitudinally along another tape. As in the prior instance, the tapes having the rows of filament loops assembled therein may be sewn or otherwise secured to pieces of fabric or other goods which it is desired to separably join.

The filament loops just described may be prepared conveniently from a wire or plastic filament in the form of an elongated continuous coil, usually of approximately helicoidal form. One segment of each loop of the coil then serves as an engaging element to engage the loops of a similar, but oppositely wound, coil and the segment of a loop which lies between and joins two such engaging elements serves as a short flexible runner to maintain spacing of the two engaging elements. When the coil is assembled in a tape the coop-

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erating action of the runner and the tape serves effectively to keep the engaging elements in fixed spaced relationship. It has been found that operation of such a separable fastener to secure accurate engagement and better holding of the separably joined stringers may be facilitated by having each loop of the coil deformed slightly so that the separate loops are each somewhat non-circular, e. g., ovoid or elliptical, in appearance when viewed in the direction of the longitudinal axis of the coil. Other irregularities in the individual loops of the coil or in the cross sectional form of the coil-forming filament are frequently provided to promote better holding and smoother operation.

The usual method for assembling a coil, such as that described, in a tape has consisted in providing a tape having a number of warp threads, or longitudinal threads, near its center omitted, placing the tape and coil in parallel longitudinal relationship with the coil over the portion of the tape where there are no warp threads, and then pushing the coil through this portion of the tape. In this manner, each woof thread, or cross thread, passes between the forward edges of two adjoining convolutions or loops of the coil and engages and lies across the inside of the rearward section of a loop. The marginal sections of the tape, having both warp and woof threads, are folded together and then usually sewn or otherwise joined along a line adjacent the coil. In this way, the woof threads anchor the tape to the coil.

When, however, a pair of link or coil stringers, such as those described, are separably joined with a slider in the usual manner, it is not uncommon for the protruding edge of the slider, which serves to guide and draw the engaging elements together into interlocking relationship, to slip between two of the links or loops when the stringer is bent sharply just ahead of the slider and thus to disengage the slider from the stringer. This is especially likely to occur in the case of separable fasteners having coil stringers. In addition to causing annoyance, it is difficult to reassemble the slider and stringer in proper relationship.

Many of the tapes heretofore used for assembling separable fasteners have been of such a character that in the finished fastener the engaging elements are exposed to view even when the fastener is separably joined. This is highly undesirable. Although tapes have been devised which overcome this difficulty to some extent, they are either difficult and costly to make or

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utilize strips or ribbons of fabric supplementary to the actual tape and this leads to a clumsy and bulky appearance of the fastener, particularly in the case of fasteners having small engaging elements.

An additional disadvantage of separable fasteners having coil stringers as heretofore made has been the tendency of the coils to turn somewhat after being assembled in a tape so that when two of such coils are separably joined, the portions of the loops of the two coils offering best engagement and maximum holding are not presented to each other.

For these and other reasons, separable fasteners, particularly those having coil stringers, have not enjoyed the wide usage that their advantages over other types of fasteners justify, and it is apparent that any method or device for overcoming the difficulties described would be of great value.

It is, therefore, an object of the present invention to provide an improved separable fastener not subject to certain disadvantages inherent in the heretofore known separable fasteners.

An additional object is to provide a separable fastener having a coil or link stringer in which a stringer is not subject to disengagement from the slider while the stringers are being separably joined.

An additional object is to provide a separable fastener wherein the engaging elements are substantially covered and hidden from view when the stringers are separably joined.

An additional object is to provide a tape for a separable fastener of novel and improved design.

An additional object is to provide a method for simultaneously forming a tape for a separable fastener and securing a stringer thereto.

These and related objects are accomplished readily and economically by assembling a row of engaging elements, e. g. a row of individual links or of loops of a continuous coil, in a stringer tape, hereinafter described and of such form that a longitudinal section of the tape will provide a continuous track or bead lying snugly against the row of elements along a line substantially opposite the engaging segments of the elements and another longitudinal section of the tape will lie along a side of the elements between the engaging segments thereof and the track to cover substantially all of the surface of one side of each of the elements which would normally be exposed to view when the fastener is separably joined. By appropriate sewing with a binding thread, as is also hereinafter described, the tape is secured firmly to the row of elements.

Reference is made to the accompanying drawing wherein, in the interest of clarity, the parts are shown greatly enlarged with certain of them somewhat exaggerated and wherein:

Figure 1 is a perspective, partly cut away, of a stringer tape for a separable fastener embodying features of the invention.

Figure 2 is a plan view of one side of a separable fastener comprising a slider and a pair of assemblies of the invention.

Figure 3 is a plan view of a section of a separable fastener assembly similar to those of Figure 2, but viewed from the reverse side.

Figure 4 is a view, partly in plan, taken along the line IV—IV of Figure 2, but with certain elements omitted for purposes of illustration.

Figure 5 is a view, partly in plan, taken along the line V—V of Figure 2,

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Figure 6 is an end elevation, partly in plan and partly in section, of a separable fastener assembly of the invention shown at an intermediate step in its formation,

Figure 7 is a view, partly in plan, taken along the lines VII—VII of Figure 6,

Figure 8 is an end elevation, partly in section, similar to the view of Figure 5, but showing engaging elements consisting of individual interlocking links instead of loops of a pair of coils.

Referring now to Figure 1, there is illustrated a stringer tape of the invention consisting of a flat fillet or ribbon 11 of fabric or other suitable material and a cord 12 longitudinally parallel therewith and at a distance removed therefrom, but tied to the ribbon by tie threads 13 and 14. The distance by which the cord 12 and the ribbon 11 are separated from one another when the tie threads 13 and 14 are taut will vary depending upon the particular type and size of the engaging elements which are to be assembled in the tape as will be apparent upon further reading of the description. The cord 12 can be of any suitable construction and can conveniently be a simple twisted cord of from 2 to 20 or more strands. The reference numeral 12 in each of the figures refers to the entire cord and not specifically to any single strand thereof. As will be apparent from the description, the size of the cord used will depend to some extent on the type and size of the engaging elements used in making the assembly and also upon the type and size of the slider used for joining and separating the assemblies of the invention. Any convenient fillet or ribbon 11 can be used, preferably a fabric ribbon woven in such fashion that it is not subject to undue distortion when stressed.

The tie threads are secured to the ribbon 11 along a line parallel with and at a slight distance from one edge of the ribbon. The distance separating the edge of the ribbon and the line of attachment of the tie threads to the ribbon should be such that when the engaging elements are assembled in the tape the portion of the ribbon 17 lying between its edge and the tie threads, herein referred to as the "marginal" portion or section of the ribbon or tape, is of appropriate width, as is shown more clearly in Figures 4, 5 and 8, to provide a covering for one side of the row of elements when the fastener is separably joined, but it should not be wide enough to more than abut the corresponding marginal section of the ribbon of the tape of the cooperating assembly to prevent crowding and buckling of the marginal sections of the tapes.

In a preferred modification of the invention, the tape is formed in situ on the row of elements, the first step of the process, as it concerns a coil fastener, being illustrated in Figure 6. As shown in Figure 6, a coil 13 suitable for use in a separable fastener is positioned longitudinally parallel with and in substantial contact with one side of a ribbon 11 with the transverse axes of the coil which are perpendicular to the ribbon intersecting the ribbon along a line parallel with and removed somewhat from one edge of the ribbon and with the segments of the convolutions or turns of the coil which are adapted to engage corresponding segments of a complementary coil facing the edge of the ribbon. A cord 12 is then positioned parallel with the coil and ribbon and on the side of the coil opposite the ribbon 11 so that the transverse axes of the coil previously referred to intersect the cord substantially along its longitudinal axis. The cord and ribbon are

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then sewn together with tie threads 13 and 14 using any convenient or conventional stitch so that the tie threads lie substantially along the same transverse axes previously referred to, the coil serving as a spacer or form to maintain proper spacing of the cord and ribbon. One type of suitable stitch is shown in Figures 4, 5, 6 and 7 and another in Figure 1.

It is apparent from Figure 6 and also from Figure 7 that the tie threads pass between individual loops of the coil. For convenience in nomenclature, the segment of each turn of the coil which is opposite the engaging segment, and which is indicated in the drawing by the reference numeral 19, e. g. of Figure 6, is designated herein as the "rearward" segment of the turn and the engaging segment 20, is referred to as the "forward" segment. Each individual loop of the coil is considered to consist of a portion of the coil filament starting at or near a rearward segment 19 and following along the filament until the next adjacent rearward segment is reached. Each loop thus includes two opposite side segments of one turn of the coil and the engaging segment between the two side segments. Each rearward segment 19 serves to join one loop of the coil to an adjacent loop. For this reason the row of rearward segments is herein considered to constitute a discontinuous runner which holds the row of loops together in proper spacing and alignment and which corresponds to the conventional continuous runner cord of the individual link type of fastener.

The separate loops or engaging elements of the coil are thus separated from one another at the forward or engaging edge of the coil but are joined together by the runner segments 19 at the rearward edge of the coil. The tie threads thus can, if desired, be disengaged from the coil by moving the coil from the position as shown in Figure 6 in a rearward direction and the coil and tape thus completely separated. When the tape is formed separately, a coil fastener can be mounted or assembled in the tape by moving the coil in a forward direction between the cord 12 and the ribbon 11 so that the threads pass between the separate loops of the coil.

The assembly is completed, after the tie threads 13 and 14 have been inserted by sewing as shown in Figure 6, by sliding the cord 12 around the outer circumference of the row of loops in a direction rearwardly of the loops until the cord lies in contact with the ribbon 11 and with the rearward or runner segments 19 of the turns of the coil. The relationship of the parts at this point is shown clearly at the left hand side of Figure 4 wherein the strands of the cord 12 are shown occupying the angle between the ribbon 11 and the rearward segments 19 of the coil. The tie threads 13 and 14 engage and lie over the rearward or runner sections 19 of the coil and hold the ribbon 11 and the cord 12 firmly against each other and against the coil.

To secure the ribbon, coil and cord in the position just described, the assembly is sewn longitudinally with a binding thread on a line between the cord and the coil. This is shown clearly in the right hand portion of Figure 4 and also in Figure 5 wherein binding threads 15 and 16 pass through the ribbon 11 and over the tie thread and thus anchor the entire assembly firmly together. It is apparent, also, that the binding threads 15 and 16 can be inserted using any suitable or convenient type of stitch and also that, if desired, the binding threads can extend not

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only over the tie thread but can be inserted so as to extend directly through the cord 12. It is apparent that the cord 12 can comprise either a substantially round multi-strand twisted structure or a narrow flat ribbon or any other relatively narrow continuous element suitable for forming a track for the slider and the term "cord" is herein used is intended to include such elements.

The cooperation of a pair of assemblies each comprising a coil, a ribbon, a cord and appropriate tie and binding threads as just described, with a slider for separably joining and for separating the assemblies is apparent from Figure 5 wherein a pair of coils 18, each assembled in a tape as described, are shown in interlocking relationship. The ribbon 11, the coil 18 and the cord 12 are secured tightly together by the tie threads 13 and 14 and the binding threads 15 and 16. Marginal sections 17 of the ribbons 11 extend sufficiently far forwardly past the tie threads along the outer circumferences of the loops of the coil to substantially meet and thus to cover completely one side of the interlocked coils. The cords 12 lie between the rearward segments 19 of the individual turns of the coil and the projecting portions 21 of the slider 22 filling substantially all of the space therebetween and providing a firmly secured track along which the slider can move and which serves effectively to prevent entry of the projecting portions of the slider between the individual turns of the coil.

Figure 8 illustrates an assembly of engaging units, consisting of individual links 23 mounted on a conventional runner cord 24, a tape similar to that of Figure 1 and appropriate tie threads 13 and 14 and binding threads 15 and 16. In this instance, a tie thread 13 extends from the ribbon 11 between the individual links, over the runner cord 24 and thence through the cord 12. Binding threads 15 and 16 serve to secure the ribbon, the stringer and the cord firmly together in a fashion identical with that described in connection with the coil stringer. Cooperation of the two separable fastener assemblies just described with the slider 22 is similar in every respect to the case of a coil fastener previously described.

I claim:

1. A tape for a separable fastener comprising a flat ribbon, a cord longitudinally parallel with the ribbon and spaced substantially therefrom, and tie threads secured to and extending between the cord and the ribbon and joining the ribbon in a single line parallel with and substantially removed from one edge of the ribbon.

2. A tape for a separable fastener comprising a fabric ribbon, a cord longitudinally parallel with the ribbon, and tie threads secured to and extending between the cord and a single line in the ribbon parallel with and removed from an edge of the ribbon to secure the cord in spaced parallel relationship to the ribbon.

3. In a separable fastener, the combination including: a row of engaging elements secured at regular intervals along a runner; a ribbon parallel with the runner and comprising a marginal section extending at least partially along one side of the engaging elements; a cord parallel with the runner and in contact with the ribbon and the segments of the engaging elements opposite the engaging segments thereof; tie threads extending between the inner edge of the marginal section of the ribbon and the cord and passing between the engaging elements on one side of the runner; and binding threads binding the

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cord and tie threads to the ribbon in firm contact therewith and with the engaging elements on the other side of the runner.

4. The combination as claimed in claim 3 wherein the row of engaging elements is a series of individually formed links.

5. The combination as claimed in claim 3 wherein the engaging elements are segments of individual loops of a continuous longitudinal coil.

6. The combination as claimed in claim 3 wherein the binding threads pass through the cord.

7. The method for making a separable fastener assembly which includes: disposing a stringer comprising engaging elements secured at regular intervals along a runner, a cord and a ribbon in parallel longitudinal relationship and so arranged that one side of each engaging element is in contact with one side of the ribbon along a line parallel with and substantially removed from one edge of the ribbon with the engaging segments of the engaging elements facing the said edge of the ribbon, and the other side of each engaging element is in contact with the cord; and sewing through the cord and ribbon between the engaging elements on one side of the runner to tie the cord and ribbon together.

8. The method for making a separable fastener assembly which includes: disposing a stringer comprising engaging elements secured at regular intervals along a runner, a cord and a ribbon in parallel longitudinal relationship and so arranged that one side of each engaging element is in contact with one side of the ribbon along a line parallel with and substantially removed from an edge of the ribbon, and the other side of each engaging element is in contact with the cord; sewing through the cord and ribbon between the engaging elements on one side of the runner to tie the cord and ribbon together; slidably displacing the cord rearwardly of and along the outer surfaces of the engaging elements until it contacts the ribbon; and sewing longitudinally of the assembly on the other side of the runner to bind the stringer, cord and ribbon securely together.

9. The method for making a separable fastener assembly which includes: disposing a stringer comprising engaging elements secured at regular intervals along a runner, a cord and a ribbon in parallel longitudinal relationship and so arranged that one side of each engaging element is in contact with one side of the ribbon along a line parallel with and substantially removed from one edge of the ribbon with the engaging segments of the engaging elements facing the said edge of the ribbon, and the other side of

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each engaging element is in contact with the cord; sewing through the cord and ribbon between the engaging elements on one side of the runner to tie the cord and ribbon together in spaced relationship; slidably displacing the cord rearwardly of and along the outer surfaces of the engaging elements until it contacts the ribbon; and sewing longitudinally of the assembly on the other side of the runner to bind the stringer, cord and ribbon securely together.

10. The method for making a separable fastener assembly which includes: disposing a coil, each convolution of which comprises an engaging segment and a runner segment, a cord and a ribbon in parallel longitudinal relationship and so arranged that one side of each convolution of the coil is in contact with one side of the ribbon along a line parallel with and substantially removed from one edge of the ribbon with the engaging segments of the convolutions facing the said edge of the ribbon, and the other side of each convolution is in contact with the cord; sewing through the cord and ribbon between the convolutions of the coil on one side of the runner segments to tie the cord and ribbon together in spaced relationship; slidably displacing the cord along the outer surfaces of the convolutions of the coil in the directions of the runner segments thereof until it contacts the ribbon; and sewing longitudinally of the assembly on the other side of the runner segments to bind the coil, cord and ribbon securely together.

11. The method of claim 10 wherein the coil, cord and ribbon are bound together by sewing longitudinally between the cord and the outer surfaces of the convolutions of the coil.

12. The method of claim 10 wherein the coil, cord and ribbon are bound securely together by sewing longitudinally through the cord and ribbon.

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