Sept. 29, 1942. C. P. SMITH 2,296,880

FASTENER

Filed Nov. 28, 1940 3 Sheets-Sheet 1

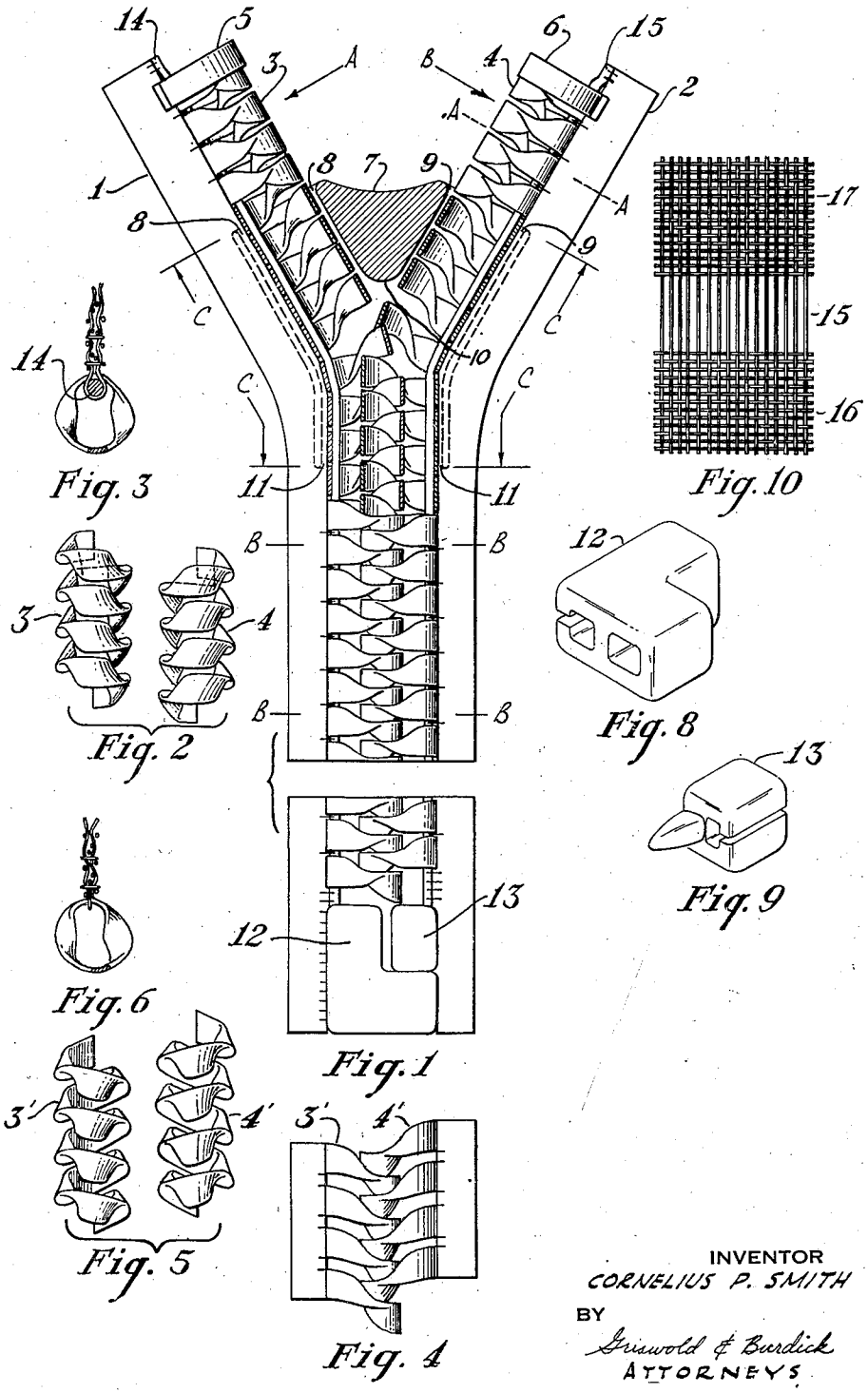


Fig. 3

Fig. 10

Fig. 2

Fig. 8

Fig. 9

Fig. 6

Fig. 1

Fig. 5

Fig. 4

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Sept. 29, 1942. C. P. SMITH 2,296,880

FASTENER

Filed Nov. 28, 1940 3 Sheets-Sheet 2

Fig. 11.

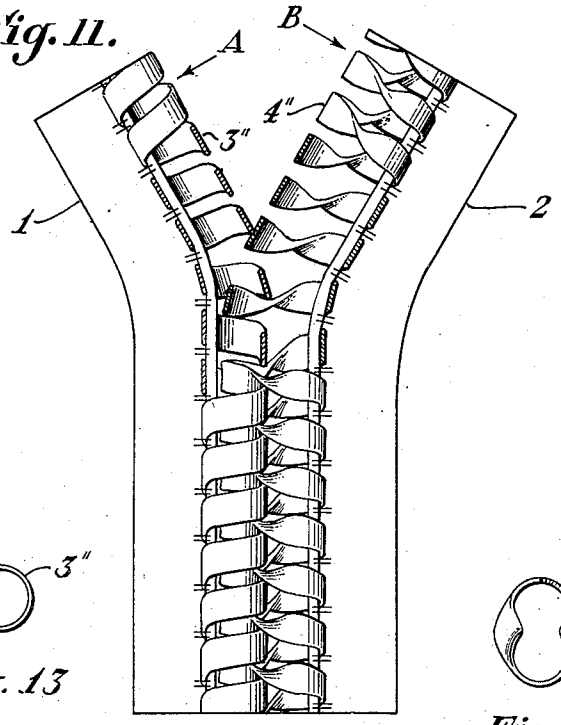




Fig. 13

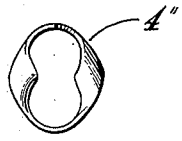
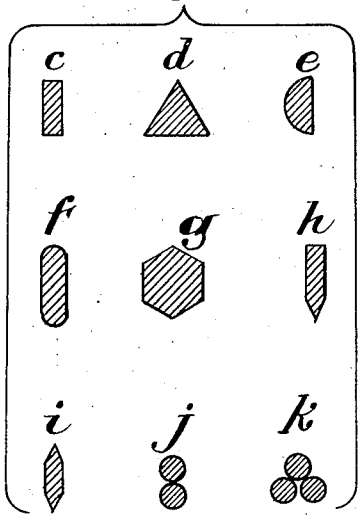


Fig. 15

Fig. 7.



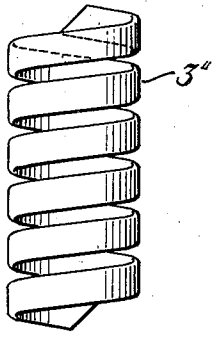


Fig. 12

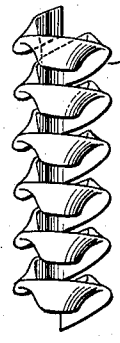


Fig. 14

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Sept. 29, 1942. C. P. SMITH 2,296,880

FASTENER

Filed Nov. 28, 1940 3 Sheets-Sheet 3

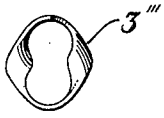


Fig. 18

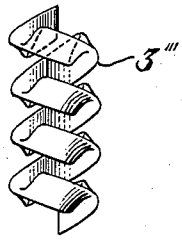


Fig. 17

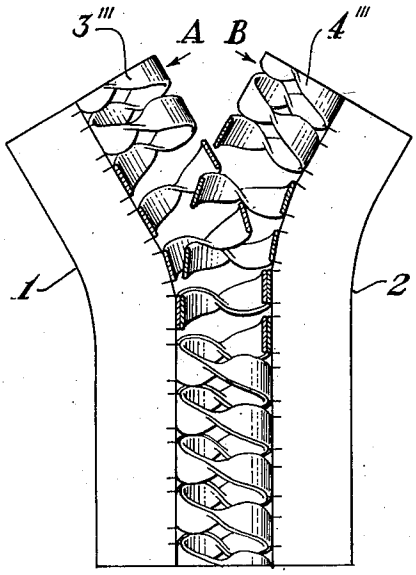


Fig. 16

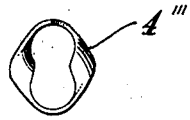


Fig. 20

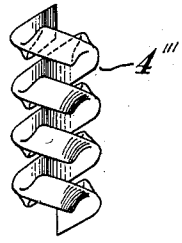


Fig. 19

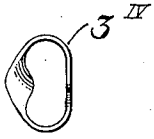


Fig. 23

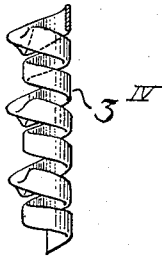


Fig. 22

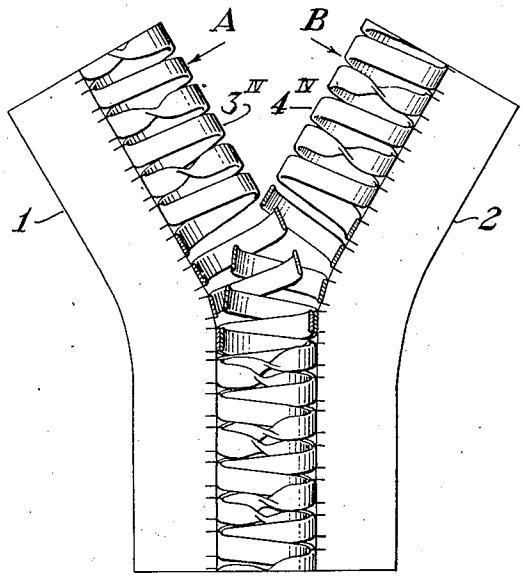


Fig. 21

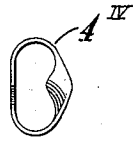


Fig. 25

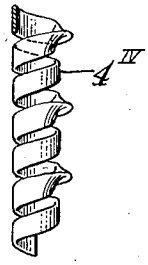


Fig. 24

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Patented Sept. 29, 1942 2,296,880

UNITED STATES PATENT OFFICE

2,296,880

FASTENER

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Application November 28, 1940, Serial No. 367,508

19 Claims. (Cl. 24—205)

This invention concerns certain new interlocking fasteners of the type comprising a pair of continuous coils capable of being intermeshed to obtain interlocking against separation by a transverse pull and capable of being fastened together and unfastened by movement of a slider lengthwise thereto.

Slide fasteners of this general type are known. In general, they comprise a pair of oppositely wound helical spring coils which are attached to the tapes or stringers forming the borders of the slit or other opening to be closed and which are capable of being fastened, i. e. intermeshed, or unfastened, i. e., unmeshed, by lengthwise movement of a slider. The simplest of such known fasteners comprises as its fastening members a pair of similar, but oppositely wound, open spring coils as obtained by winding wire of uniform cross-section on a mandrel. Each coil is wound and is attached to its stringer in such position that the lengthwise spacing between the successive turns of the one coil is slightly less than the diameter of the wire of the other coil, in order that the intermeshing portions of each coil may be squeezed between corresponding portions of the other coil so as to create a frictional resistance to unmeshing of the coils by a transverse pull. Since such simple coil fastener resists opening by frictional force only and since bending of the intermeshed coils is liable to reduce or eliminate the frictional seizure and cause unfastening, this simple fastener is poorly suited to most purposes.

In order to cause positive interlocking of such spring coil fasteners, it has heretofore been proposed either to swage the inner portion of at least one of the coils so as to produce a lip or other projection which will extend lengthwise within, and will positively interlock with, the mating coil, or to cause a transverse bend in at least one coil so as to form a hook which will positively interlock with the other coil. Another proposal has been to notch the coils transversely at the points where they intermesh so as to produce between the notches on a turn of each coil a knob or projecting lip which will afford positive interlocking with the other coil. The manufacture of these previously known positively interlocking coil fasteners involves extra swaging, notching, or bending operations which add to the cost of the products and which must be executed with precision and care if the fastener is to operate smoothly. Also, most interlocking coil fasteners heretofore known have a mechanical appearance that is not particularly pleasing.

An object of this invention is to provide positively interlocking coil fasteners which are simple and inexpensive to make, which have a pleasing appearance, and which provide positive interlocking of the fastener members even when the fastener as a whole is bent or flexed. Another object is to provide coil fasteners, the coils of which remain positively interlocked even when the fastener as a whole is subjected to exceptional lengthwise stretching. Other objects will be apparent from the following description of the invention.

The coil fasteners provided by the invention comprise, as the interlocking members, a pair of spring coils which are capable of being mated with one another, i. e. which are capable of being fitted together at the sides so that the convolutions of one coil intermesh in a locked position with those of the other coil. The wire or other filament making up at least one of the coils is of uniform, but non-circular, cross-section, i. e. a transverse segment thereof has at least two unequal diameters, viz. a greater diameter and a lesser diameter. The non-circular wire or filament may of course be composed of one or more individual filaments or threads. For instance, two or more filaments of circular or non-circular cross-section may be employed side by side, or twisted together, or intertwined, to form a strand of non-circular cross-section which is suitable for making up the coil.

At least one coil made up of such filaments of non-circular cross-section, is provided with one or more twists in the filament about the axis of the latter in at least the alternate convolutions of the coil. Each such twist of the filament about its own axis is sufficient to bring the filament from a position in which its major diameter is substantially parallel to the axis of the coil to position where a lesser diameter of the filament is substantially parallel to the axis of the coil and onward to another position where a major diameter of the filament is substantially parallel to the axis of the coil. There is thus formed between successive turns of the coil a series of openings through which portions of the turns of another coil may project. The twists about its own axis given to the non-circular filament of the coil may be a series of left hand twists, or a series of right hand twists, or alternate left hand and right hand twists, as desired. In order to avoid misunderstanding as to the meaning of "left hand twist" and "right hand twist" it may be mentioned that the threads of a screw which must be turned to the right, i. e. clockwise, for

tightening are considered herein as having a right hand twist, even though in order to form such threads by a twisting operation the twist thus exerted would be to the left.

The invention is not restricted to having only one such twist of the non-circular filament in a convolution of the coil or to having such twists in only the alternate convolutions of the coil. Instead, there may be two or more such twists of the filament in a single convolution of the coil. Also, there are preferably one or more such twists of the filament in each of the successive convolutions of the coil. Twists of the filament about its own axis in different convolutions of the coil are preferably aligned substantially parallel to the axis of the coil; i. e. the distance between successive twists in the filament of the coil is preferably a simple fraction or multiple of the length of a convolution of the coil. The twists in the non-circular filament, strand, or wire about its own axis are conveniently made during winding of the same, e. g. about a mandrel, to form the coil.

Although at least one of the coils forming the interlocking members of the fasteners provided by the invention must be made up of a filament or strand of non-circular cross-section which is provided with a series of twists about its own axis, as just described, it is not necessary that the other coil which is to be mated therewith be so constructed. Instead, the other coil may, in many instances, be a plain coil made up from a filament of either circular or non-circular cross-section without any twisting of the filament about its own axis within any convolution of the coil. However, it is essential that the two coils be capable of being mated, i. e. intermeshed, with one another. In order to meet this requirement, the two coils should have nearly the same pitch and diameter. The two mating coils are preferably of similar size and form.

The two coils which serve as the interlocking members of the fastener are preferably wound oppositely, i. e. one of the coils is preferably wound to the left and the other to the right, since a pair of such coils when intermeshed usually presents an exceptionally pleasing braid-like appearance, but this is not essential. Fasteners of good appearance which may be opened and closed smoothly and which when closed are strongly resistant to opening by a transverse pull, may be prepared in accordance with the invention using mating coils which are wound in the same direction, i. e. using coils which are both of right hand winding or both of left hand winding.

A single coil of the fasteners herein may, when viewed at an end, be of cylindrical, oval, or nearly flat appearance, i. e. a transverse cross-section of the coil may be circular, or oval. Coils of oval cross-section are preferred, since they may be caused to lie most nearly in the plane of the goods to which they are to be attached. A coil of oval cross-section may be obtained by winding of a filament upon a mandrel of oval cross-section, or by winding the filament as a coil upon a mandrel of circular cross-section and thereafter flattening the coil by pressing on one side of the same.

In the drawings:

Fig. 1 is a view of an embodiment of the invention, certain of the parts being shown in cross-section. The mating coils are oppositely wound and each coil is made up of a ribbonlike filament which is given a series of twists in the same direction about its own axis.

Fig. 2 is a side view of the two coils 3 and 4 of Fig. 1 as seen from a central position between the coils in the directions indicated by the arrows (A) and (B) in Fig. 1.

Fig. 3 shows one way in which a coil may be attached to the tape at the cross-section A—A of Fig. 1.

Fig. 4 is a view of a section of another embodiment of the invention which corresponds to the section B—B in Fig. 1, except that each coil shown is made up of a ribbonlike filament which has been given a series of alternate left hand and right hand twists about its own axis.

Fig. 5 is a central side view of the interlocking coils shown in Fig. 4. The views of the coils (3') and (4') shown in Fig. 5 are in directions correspondig to those indicated by the arrows (A) and (B), respectively, in Fig. 1.

Fig. 6 is a top view showing one convolution of one of the coils of Figs. 4 and 5 and indicating a way in which the coil may be attached to the tape.

Fig. 7 shows cross-sections of a number of the various non-circular filaments or wires which may be employed in forming the interlocking coils of the fastener.

Figs. 8, and 9 are perspective views of the clasp members at the lower ends of the respective stringers.

Fig. 10 shows how a fabric may be prepared for attachment to a coil in the manner shown in Figs. 3 and 6.

Fig. 11 is a view of an embodiment of the invention wherein a coil 4'' made up of a ribbonlike filament, which is provided with two 180° twists about its own axis per convolution of the coil, is mated with an oppositely wound plain coil 3'' having no such twists in its filament. The view of this embodiment shown would correspond in position to section C—C of Fig. 1. In Fig. 11 certain of the parts are shown in cross-section.

Fig. 12 is a side view of coil 3'' as seen from the direction of arrow A in Fig. 11.

Fig. 13 is a top plan view of one convolution of coil 3''.

Fig. 14 is a side view of coil 4'' as seen from the direction of the arrow B in Fig. 11.

Fig. 15 is a top view of one convolution of the coil 4''.

Fig. 16 is a view, partly in cross-section, of an embodiment wherein two mating coils, 3''' and 4''', are wound in the same direction and are of similar size and form, each coil being made up of a ribbonlike filament which is given two 180° twists about its own axis per convolution of the coil. The position of the fastener shown in Fig. 16 corresponds in position, with respect to other parts of the fastener not shown, to the section C—C in Fig. 1.

Fig. 17 is a side view of the coil 3''' as seen from the direction of the arrow A in Fig. 16.

Fig. 18 is a top view of one convolution of the coil 3'''.

Fig. 19 is a side view of the coil 4''' as seen from the direction of the arrow B in Fig. 16.

Fig. 20 is a top view of one convolution of the coil 4'''.

Fig. 21 is a view, partly in cross-section, of an embodiment of the invention wherein two oppositely wound mating coils 3^{IV} and 4^{IV}, of similar size are each made up of a ribbonlike filament which is given a single 180° twist about its own

axis in alternate convolutions of the coil, but the filament is not twisted about its own axis at any point in the other convolutions of the coil. The view of this embodiment shown would correspond in position to section C—C of Fig. 1.

Fig. 22 is a side view of the coil 3^{IV} as seen from the direction of the arrow A in Fig. 21.

Fig. 23 is a top view of one convolution of the coil 3^{IV}.

Fig. 24 is a side view of the coil 4^{IV} as seen from the direction of the arrow B in Fig. 21.

Fig. 25 is a top view of one convolution of the coil 4^{IV}.

In the various figures of the drawings, similar parts are designated by similar numerals.

In Fig. 1, the numerals 1 and 2 designate the tapes or other fabrics to which the interlocking coils 3 and 4 are attached. The upper portions of the stringers are shown in unengaged positions, i. e. spread apart, whereas the lower portions are shown in engaged position, i. e. with the coils interlocked. The upper ends of coils 3 and 4 are engaged in clasps 5 and 6, respectively, which clasps are suitably attached to the tapes as indicated. The lower end of coil 3 terminates adjacent to the scoop 12 and the lower end of the coil 4 terminates at clasp 13. Section C—C of Fig. 1, which includes a usual slider 7 for causing interlocking or unfastening of the coils 3 and 4, is shown in cross-section. Slider 7 is provided with channels 8 and 9 for the coils 3 and 4, respectively. The channels 8 and 9 merge at fork 10 into the single channel 11.

The coils shown in Fig. 1 are made up of ribbonlike filaments having the rectangular cross-section shown as *c* in Fig. 7. The filament used in forming such coil may be of metal or of any of a wide variety of organic plastic materials, e. g. solid polymers of styrene, vinyl chloride, vinylidene chloride, or methyl methacrylate, etc., or resinous co-polymers of such compounds with other unsaturated organic compounds. Such organic plastics are preferred, since they are readily colored to match fabrics with which they are to be employed and they usually have a pleasing non-metallic feel to the hand. The filament should be sufficiently stiff and elastic to retain its shape after being formed, but is preferably sufficiently flexible so that it may be bent without breaking. The fasteners provided by the invention permit the use of exceptionally flexible filaments in forming the interlocking coils thereof.

Each coil in Fig. 1 is made up by winding the ribbonlike filament, e. g. on a mandrel, while twisting the filament by 180° about its own axis at two opposing points on each turn about the mandrel. The resultant coil possesses two points in each of its convolutions at which it may be interengaged with another coil to obtain positive interlocking of the coils, i. e. either of the opposing sides of the coil may be attached to the tape, since each side possesses means for positive interlocking with similar coil.

The interengaging coils shown in Figs. 4, 5, and 6 are similar to those in Figs. 1, 2, and 3, except that the filament has been given alternate left hand and right hand twists about its own axis during winding to form each coil, each such twist of the filament about its axis approximating 180°.

Coil 4'', of Figs. 11, 14, and 15, is made up of a ribbonlike filament which has been given alternate 180° left hand and right hand twists about its own axis, two such twists being provided in each convolution of the coil. It resembles coil 3' of Figs. 4 and 5. However, in Fig. 11, the coil 4'' is mated with an oppositely wound plain coil 3'', the filament of which has no twists about its own axis within any of the convolutions of the coil.

The interengaging coils shown in Figs. 16–20, are of the same size and shape and are wound in the same direction, i. e. to the left. Each coil is made up of a ribbonlike filament which is provided with two 180° right hand twists about its own axis per convolution of the coil.

The interengaging coils shown in Figs. 21–25, are oppositely wound and are made up of ribbonlike filaments, each of which is given a single 180° twist about its own axis in alternate convolutions of the coil. The twists in the two filaments about their own axis are both in the same direction, e. g. they are both right hand twists.

It will be apparent from the foregoing that the coils constituting the interlocking members of the fastener may be shaped and twisted in ways other than those specifically shown in the drawings. For instance, instead of providing two 180° twists of the filament per convolution of the coil, as shown in Figs. 1–6, it may have only one such twist per convolution, in which case only one side of each coil will be provided with positively interengaging members and the other side must be attached to the tape or fabric. When so constructed the coils intermesh in such manner that at the points where their respective filaments cross, one filament has its minor diameter parallel to the axis of the coil and the other filament has its major diameter parallel to the axis of the coil. Again, instead of only one or two such twists of the filament about its axis per convolution of the coil, any desired number of such twists may be provided.

The filament or strand used in making up a coil of the type required need not be a ribbon, but may be of any non-circular cross-section. Fig. 7 shows by way of illustration a number of the various cross-sections which the filament may have. The angle by which the filament should be twisted about its own axis at one or more points per convolution of the coil is, of course, dependent upon its cross-section. For instance, in employing a filament having the rectangular cross-section shown as *c* in Fig. 7, or the half-round cross-section *e*, or the oblong section *f*, or the elongated pentagonal cross-section *h*, or the elongated hexagonal cross-section *i*, or the substantially oblong cross-section *j* formed by two individual circular filaments side by side, the twists about the axis of the filament are advantageously 90° twists or a multiple thereof. The arithmetical sum of the degrees of twist of the filament about its axis per convolution of the coil should be zero or a multiple of 90°, depending upon whether the successive twists to the filament are in opposing directions or in the same direction. When the filament used in making up a coil has the triangular cross-section shown as *d* in Fig. 7, or the clover-leaf cross-section shown as *k*, then the twists about its axis per convolution of the coil should be approximately 30° or a multiple thereof. The sum of the degrees of twist of such filament about its axis per convolution of the coil should of course be either zero or should approximate a multiple of 30°. When the filament has the hexagonal cross-section *g* in Fig. 7, the twists about the axis of the same per convolution of the coil should amount to approximately 30° or a multiple thereof. Here also the sum of the degrees of

twist to the filament per convolution of the coil should either be zero or approximately a multiple of 30°. It may be stated generally that regardless of the shape of the cross-section of the filament (provided of course that it is non-circular) in each convolution of the coil, the filament should be twisted about its own axis in such manner that, when starting with the major diameter of the filament parallel to the axis of the coil, a minor diameter of the coil shall be rendered substantially parallel to the axis of the coil, and the twist shall either be continued in the same direction or in opposite direction until the major diameter of the filament is again substantially parallel to the axis of the coil.

It will be noted that by applying an equal number of equal but opposing twists to the filament, the sum of the degrees of twist in the filament may be zero; which of course does not mean the absence of twists. It will also be noted that although it is specified that each twist about its axis of a ribbonlike filament should be approximately 90° or a multiple thereof, that a single 90° twist about the axis of the filament per convolution of the coil is difficult to obtain and may be impractical. However, two successive 90° twists of such filament in opposite directions, or a single 180° twist of the filament in a single direction, are readily obtainable and do suffice for the formation of a coil of the type required by the invention. A multiplicity of such twists may, of course, be applied to the filament.

The fasteners herein described resist opening by a transverse pull on the intermeshed coils thereof due to the fact that the coils intermesh, i. e. the filaments of the respective coils cross one another, at a point where the lesser diameter of one or both of the filaments is at, or approaching, a position parallel to the axis of the coil, whereas at a point of the portion of the convolution of one coil which is nested within the other coil the major diameter of the filament is substantially parallel to the axis of the coil. The amount by which the intermeshed coils may be elongated by stretching before unfastening of the coils by a transverse pull becomes possible, is of course dependent upon the difference between the major and the minor diameters of the filament of each coil. In other words as the difference between these diameters of the filament of each coil is increased; the resistance to unfastening by the simultaneous application of lengthwise and transverse pulls upon the interlocked coils becomes greater. Although any suitable filament of non-circular cross-section may be used in making up a coil of the fastener, the filament is advantageously one wherein the major diameter is at least 1.2 and preferably 1.5 or more times the minor diameter.

The coils comprising the interlocking members of the fasteners herein disclosed may be attached in any of the usual ways to the goods to be joined thereby. Each convolution of such coil may be sewn onto the edge of the material from which it extends, or may be interwoven with the material at one edge, or may be affixed to the material by means of adhesives, etc. Again a cord, 14 or 15, may be extended lengthwise through the coil and the cord may be sewn, tied, or interwoven with the material to which the coil is to be affixed in the spaces between the convolutions of the coil. Two modes of attaching a coil to the material are illustrated in the drawings. Fig. 10 illustrates how a number of strands extending in the same direction near the marginal portion of the material may be removed leaving an open portion of strands 15. A coil having cord 14 extending lengthwise therethrough is laid across these strands and pressed through the fabric, so that one or more of the strands 15 cross the cord 14 and extend between adjacent convolutions of the coil. The margin portion 16 may then be tacked onto the remainder of the material 17, e. g. by sewing. The resultant attachment of a convolution of the coil to the material is illustrated in Fig. 3. If desired, these same operations for attaching the coil to the material may be executed, omitting the cord 14, in which case the final attachment of a convolution of the coil to the material is similar to that shown in Fig. 6.

The fasteners provided by the invention may be opened and closed in either direction, i. e. a slider for opening and closing the fastener may be operated from either end of the latter. This is a desirable feature, since the braidlike appearance of the fastener usually differs somewhat depending upon the end or the side from which it is viewed. The fact that when employed on coats, shirts, etc., either end of the fastener may be upward and either side may be exposed permits considerable choice of the pattern which may be obtained by attachment of the fastener to the goods. Also, two sliders, operable from opposing ends, may be used on the fastener.

The mode of opening and closing the fastener by means of a slider will be apparent from Fig. 1 of the drawings. As the slider 7 is raised, the convolutions of coils 3 and 4 are caused to slide over and nest into one another in a firmly interlocked position. The fastener is fully locked when slider 7 is raised to the clasps 5 and 6. It is unlocked when slider 7 is lowered so as to encompass clasp 13 and scoop 12. When in this position, clasp 13 may be withdrawn through channel 9 of the slider, thus fully disengaging the goods to which coils 3 and 4 are attached. For refastening, clasp 13 is reinserted in scoop 12 by way of channel 9 of slider 7 and the latter is then raised.

Although I have in this application shown and described certain embodiments of my invention, it will be understood that these embodiments are merely illustrative and that other forms may be devised within the scope of the following claims.

I therefore particularly point out and distinctly claim as my invention:

1. A fastener comprising as the interlocking members thereof a pair of coils capable of being mated with one another, the filament of at least one of the coils being of substantially uniform but non-circular cross-section and being twisted about its own axis, at least once in each of at least the alternate convolutions of the coil, from a position where the major diameter of the filament is substantially parallel to the axis of the coil to a position where the minor diameter of the filament is substantially parallel to the axis of the coil to another position where the major diameter of the filament is substantially parallel to the axis of the coil.

2. A fastener as described in claim 1 wherein at least one of said twists of the non-circular filament about its own axis occurs in each of the successive convolutions of the coil.

3. A fastener as described in claim 1 wherein there are at least two of said twists of the non-circular filament about its own axis in each of at least the alternate convolutions of the coil.

4. A fastener as described in claim 1 wherein there are two of said twists of the non-circular filament about its own axis in each of the successive convolutions of the coil.

5. A fastener as described in claim 1 wherein a coil having at least two of said twists of the non-circular filament in each of at least its alternate convolutions is mated with a plain coil, the filament of which is substantially untwisted.

6. A fastener as described in claim 1 wherein the mating coils are wound in the same direction.

7. A fastener as described in claim 1 wherein the mating coils are of substantially the same size and form and are wound in the same direction.

8. A fastener as described in claim 1 wherein the mating coils are wound in opposite directions.

9. A fastener as described in claim 1 wherein the mating coils are wound in opposite directions and one of said coils is a plain coil having no appreciable twists of its filament about the axis of the latter in any of the convolutions of the coil.

10. A fastener as described in claim 1 wherein the filament of each of the mating coils is of non-circular cross-section and is provided with at least one of said twists of the filament about its own axis in each of at least the alternate convolutions of the coil, the twists being aligned substantially parallel to the axis of the coil, and the two mating coils being wound in opposite directions.

11. A fastener as described in claim 1 wherein the filament of each of the mating coils is of non-circular cross-section and is provided with at least one of said twists of the filament about its own axis in each of the successive convolutions of the coil, twists in the filament in successive convolutions of the coil being aligned substantially parallel to the axis of the coil, and the two mating coils being wound in opposite directions.

12. A fastener comprising a pair of oppositely wound coils capable of being mated, the filament of each coil being of substantially uniform but non-circular cross-section and being twisted about its own axis in each convolution of the coil so that a portion of the filament has its major diameter substantially parallel to the axis of the coil and another portion of the filament has a minor diameter substantially parallel to the axis of the coil.

13. A fastener as described in claim 12 wherein the filament of each coil has a major diameter at least 1.2 times as great as its minor diameter.

14. A fastener as described in claim 12 wherein the filament of each coil has a major diameter at least 1.5 times as great as its minor diameter.

15. A fastener as described in claim 12 wherein the filament of each coil has a major diameter at least 1.5 times as great as its minor diameter and in each convolution of the coil the filament is twisted about its own axis in at least two distinct points so as to bring its minor diameter substantially parallel to the axis of the coil at each of said points, the major diameter of the filament being substantially parallel to the axis of the coil at other points in each convolution of the coil.

16. A fastener as described in claim 12 wherein the filament of each coil has a major diameter at least 1.5 times as great as its minor diameter and is given a series of twists in the same direction about its own axis, at least one such twist occurring in each convolution of the coil and each such twist of the filament about its own axis amounting to approximately 180°, said twists of the filament in the successive convolutions of a coil being aligned with one another parallel to the axis of the coil and said twists in the filaments of the two coils being matched so that the two coils may be intermeshed in a position which provides positive interlocking against separation by a transverse pull.

17. A fastener as described in claim 12 wherein the filament of each coil has a major diameter at least 1.5 times as great as its minor diameter and is given a series of alternate right hand and left hand twists about its own axis, such twists in the filament during each convolution of the coil being sufficient to bring the filament from a position in which its major diameter is substantially parallel to the axis of the coil to a position in which its minor diameter is substantially parallel to the axis of the coil and to another position in which its major diameter is substantially parallel to the axis of the coil, the twists of the filament about its own axis in the successive convolutions of a coil being aligned with one another parallel to the axis of the coil and said twists in the filaments of the two coils being matched so that the two coils may be intermeshed in a position which provides positive interlocking against separation by a transverse pull.

18. A fastener as described in claim 12 wherein each coil when viewed at the end is of oval shape.

19. A fastener comprising the oppositely wound coils described in claim 12 and a slider therefor, each coil being attached to the margin of a fabric and the coils being partially encompassed by the slider which may be employed for opening and closing the fastener by lengthwise movement along the coils.

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