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3,143,779

SLIDE FASTENER STRINGER

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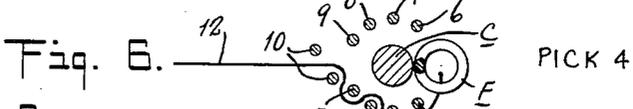
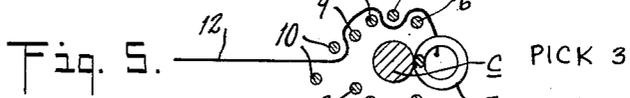
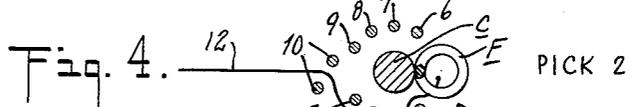
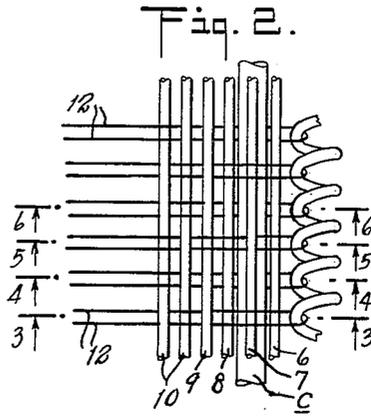
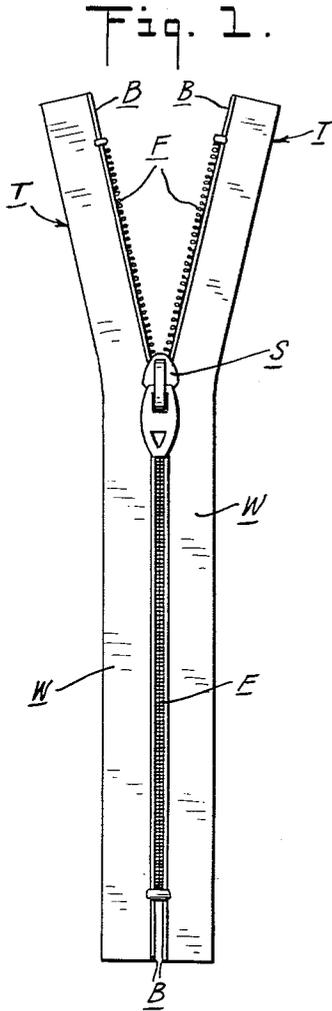


Fig. 8.

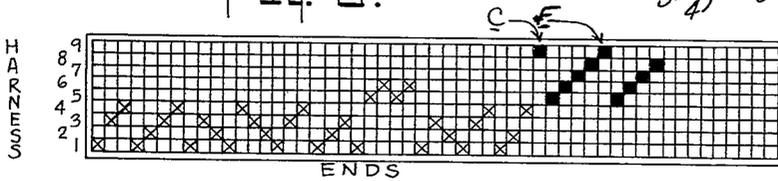
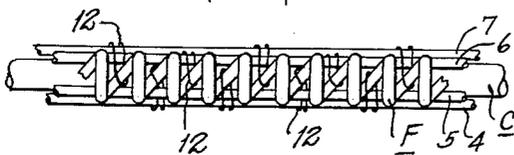


Fig. 7.



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SLIDE FASTENER STRINGER

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This invention relates to slide fasteners, and more particularly to the type wherein the interlocking means consists of a continuous pre-formed filament such as a coiled or spirally-arranged filament. In the present invention the filament is secured to the edge of the tape during the weaving thereof.

While it has been suggested broadly to weave the pre-formed filament into the edge of the tape at the time of weaving thereof, in most cases an unsatisfactory product was obtained, primarily, for the reason that the filament was not properly secured to the edge of the tape. Usually the filament was too loosely interwoven with the weft threads which resulted in a stringer in which the filament was not satisfactorily affixed to the edge of the tape and distortion or displacement of the filament often occurred when in use. It is imperative in such a woven-in-filament construction that the filament be subjected to the proper tension, both during the weaving operation and in the resulting product, so that the filament is firmly held and, yet not distorted, and it is to an improved stringer having these advantages that the present invention relates.

Accordingly, it is the general object of the present invention to provide an improved stringer for slide fasteners in which a pre-formed filament is woven integral with the edge of the tape at the time of the weaving thereof which is inexpensive in its construction and, at the same time, strong and rugged whereby a satisfactory slide fastener stringer is provided.

It is another object of the invention to provide such a stringer having a new and improved weave for securely attaching the filament to the edge of the tape so as to prevent any displacement or distortion thereof both during the weaving operation and when it is in use.

It is a more specific object of this invention to provide an improved woven-in-filament type stringer for slide fasteners wherein there is provided an elongated relatively large cord to which the series of convolutions of a pre-formed coiled filament are securely bound by means of a plurality of warp threads arranged therearound which are interwoven with a weft thread so as to securely affix the filament to the cord and, at the same time, to provide a beaded edge construction along the edge of the tape directly next to the filament.

Various other objects and advantages of this invention will be more apparent in the course of the following specification, and will be particularly pointed out in the appended claims.

In the accompanying drawings, there is shown for the purpose of illustration, an embodiment which my invention may assume in practice.

In these drawings:

FIG. 1 is a plan view of a slide fastener having tape stringers in accordance with the present invention incorporated therewith,

FIG. 2 is an enlarged diagrammatic plan view of a fragment of the tape stringer constructed in accordance with the invention,

FIG. 3 is a sectional view taken on line 3—3 of FIG. 2, showing the first pick or course of weave,

FIG. 4 is a sectional view taken on line 4—4 of FIG. 2, showing the second pick of the weave,

FIG. 5 is a sectional view taken on line 5—5 of FIG. 2, showing the thread pick of the weave,

FIG. 6 is a sectional view taken on line 6—6 of FIG. 2, showing the fourth pick of the weave,

FIG. 7 is an enlarged edge view of the stringer shown in FIG. 2, and

FIG. 8 is a weaver's diagram for the improved tape stringer of my invention.

The present invention will be described with reference to the interweaving of a continuous coiled filament consisting of a series of interconnected convolutions of the type shown in U.S. patent to Nicholas Wahl, No. 2,300,442 dated November 3, 1942. Such filament is made preferably of nylon, perlon or of some other suitable plastic material. While the present invention is illustrated in connection with a coiled filament, it will be understood that any other type of continuous pre-formed filament may be employed, such as the so-called "Ladder" or "Meander" type.

In FIG. 1 of the drawings, there is illustrated a slide fastener having a pair of stringers T incorporated therewith constructed in accordance with present invention. Each of these stringers consist of a web portion W and a beaded edge B having a continuous coiled interlocking filament F attached to the outer side thereof and on which there is arranged a slider S for longitudinal movement therealong for interengaging and disengaging the opposed coiled filaments F in a manner well known to those skilled in the art.

According to the present invention, and referring more particularly to FIGS. 2 through 7 of the drawings, the outer beaded edge B of each of the stringers consists of a longitudinally extending stuffer cord C having a plurality of longitudinally extending warp threads arranged therearound in substantially circular fashion so as to be substantially concentric therewith, eight in the present instance, and designated as 2 through 9 of the drawings. The body of the tape is of a conventional twill design or weave and consists of a plurality of warp threads 10 interwoven with a weft or filler thread 12. The weave of each of the picks as shown, is generally over one and under one of the warp threads throughout the tape, but any other suitable weave may be provided.

The tape stringer in accordance with the present invention is well adapted to be woven on a needle or shuttleless loom. As clearly illustrated in FIGS. 2 through 6 of the drawings, the first pick of the weft 12 which is a double pick passes through and between the warp threads 10 in the web so as to be interwoven therewith, then in under the warp thread 9 at the beaded edge on one or upper side thereof, as shown in FIG. 3, over the warp threads 6, 7 and 8 at said edge, and over and around a convolution of the coiled filament.

The second double pick passes through the web, then over warp threads 2 and 3 of the beaded edge on the opposite or lower side thereof, as shown in FIG. 4, in under the warp thread 5 of said edge, and again over and around a convolution of the filament F.

The third double pick of the weft thread passes through the web, then over the warp threads 8 and 9 of the beaded edge on the first or upper side thereof, as shown in FIG. 5, in under warp thread 7 and over warp thread 6 of said edge, and, as before, over and around a convolution of coiled filament F.

The fourth and last double pick to complete one weaving cycle passes through the web, then over the warp thread 2 and in under the warp thread 3 of the beaded edge on the second or lower side thereof, as shown in FIG. 6, over the warp threads 4 and 5 of said edge, and again over and around a convolution of the coiled filament F.

In FIG. 8, of the drawings, there is shown a conventional weaver's diagram for the particular tape stringer herein illustrated. The diagram refers to the position of the harnesses and frames, the crossed white squares and black squares corresponding to an up position and the all white squares corresponding to a down position, or vice

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versa. The right hand side of this diagram represents the weave of the beaded edge. The black squares correspond to the warp threads 2 through 9 together with the stuffer cord C which form the beaded edge and the filament F. The remainder of the diagram is a harness diagram with the crossed white squares corresponding to the warp threads of the web W.

As a result of my invention, it will be seen that there is provided a stringer for slide fasteners of a woven-in-filament type construction in which the filament is held firmly and securely in position due to the arrangement and interweaving of the weft thread with the warps and cord at the edge of the tape together with the convolutions of the filament. It will be noted that the elongated filament F is held securely in position directly next to the elongated cord C by the weft thread 12 so as to provide a rather compact arrangement.

It will be seen further that an elongated beaded portion is formed along the edge of the tape directly next to the coiled filament due to the arrangement of the cord C and the warp threads arranged therearound which are interwoven with the weft thread 12 which is a most desirable feature in this type of stringer construction and one of the most important aspects of the present invention.

While I have shown and described an embodiment which my invention may assume in practice, it will be understood that this embodiment is merely for the purpose of illustration and description, and that other forms may be devised within the scope of my invention as defined in the appended claims.

I claim:

1. In a stringer for a slide fastener, a plurality of longitudinally extending warp threads, a continuous weft thread interwoven back and forth through and between said warp threads so as to provide a woven web, a beaded edge arranged along one edge of said web consisting of a longitudinally extending cord having a plurality of longitudinally extending warp threads disposed therearound, a continuous filament arranged along said web at the outer side of said cord having one side only in contact therewith coextensive throughout the length thereof, said filament being deformed so as to provide spaced interlocking means therealong, said weft thread also being interwoven with said last mentioned longitudinally extending warp threads and extending around both said cord and said filament between said interlocking means, the weft thread passing through the web, over and between the last mentioned warp threads on one side of the cord at the edge of the tape, over and around the cord and filament at said edge, then back over and between the last mentioned warp threads on the opposite side of the cord, and back through the web to complete one weaving cycle.

2. In a stringer for a slide fastener, a plurality of longitudinally extending warp threads, a continuous weft thread interwoven back and forth through and between said warp threads so as to provide a woven web, a beaded edge arranged along one edge of said web consisting of a longitudinally extending cord having a plurality of longitudinally extending warp threads disposed therearound, a continuous coiled filament arranged along said web at the outer side of said cord having one side only in contact therewith coextensive throughout the length thereof, each of the convolutions of said coiled filament being deformed so as to provide interlocking means thereon, said weft thread being interwoven with said last mentioned longitudinally extending warp threads and extending around both said cord and the convolutions of said coiled filament between said interlocking means, the weft thread passing through the web, over and between the last mentioned warp threads on one side of the cord at the edge of the tape, around the cord and the convolutions of said filament at said edge, then back over and between the last mentioned warp threads on the opposite side of the cord and back through the web to complete one weaving cycle.

3. In a stringer for a slide fastener, a plurality of lon-

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gitudinally extending warp threads, a continuous weft thread interwoven back and forth through and between said warp threads so as to provide a woven web, a beaded edge arranged along one edge of said web consisting of a longitudinally extending cord having at least eight longitudinally extending warp threads disposed therearound, four on each side, a continuous filament arranged along said web at the outer side of said cord having one side only in contact therewith coextensive throughout the length thereof, said filament being deformed so as to provide spaced-apart interlocking means therealong, said weft thread being interwoven with said last mentioned longitudinally extending warp threads and extending around both said cord and said filament between said interlocking means, the weft thread passing through the web, under one of the last mentioned warp threads on one side of the cord and over the other three warp threads on that side of the cord, then over and around both the cord and filament, under one of the last mentioned warp threads on the opposite side of the cord, then over the other three warp threads on that side, back through the web to the opposite side of the web, then again back through the web, over two of the last mentioned warp threads on the first side of the cord, under the next warp thread on that side, over the remaining warp threads on that side, over and around the cord and filament, then back over two of the last mentioned warp threads on the second side of the cord, under the next warp thread on that side, over the remaining warp thread on that side, and then back through the web to complete the cycle.

4. In a stringer for a slide fastener, a plurality of longitudinally extending warp threads, a continuous weft thread interwoven back and forth through and between said warp threads so as to provide a woven web, a beaded edge arranged along one edge of said web consisting of a longitudinally extending cord having at least eight longitudinally extending warp threads disposed therearound, four on each side, a continuous coiled filament arranged along said web at the outer side of said cord having one side only in contact therewith coextensive throughout the length thereof, each of the convolutions of said filament being deformed so as to provide interlocking means thereon, said weft thread being interwoven with said last mentioned longitudinally extending warp threads and extending around both said cord and the convolutions of said coiled filament between said interlocking means, the weft thread passing through the web, under one of the last mentioned warp threads on one side of the cord and over the other three warp threads on that side of the cord, then around said cord and a convolution of said filament, under one of the last mentioned warp threads on the opposite side of the cord, then over the other three warp threads on that side, back through the web to the opposite side of the web, then again back through the web, over two of the last mentioned warp threads on the first side of the cord, under the next warp thread on that side, over the remaining warp threads on that side, over and around said cord and a convolution of said filament, then back over two of the last mentioned warp threads on the second side of the cord, under the next warp thread on that side, over the remaining warp thread on that side, and then back through the web to complete the cycle.

5. In a stringer for a slide fastener, a plurality of longitudinally extending warp threads, a continuous weft thread interwoven back and forth through and between said warp threads so as to provide a woven web, a marginal edge portion arranged along one side of said web consisting of a single longitudinally extending cord having a plurality of longitudinally extending warp threads together with a continuous filament disposed therearound, both of said last warp threads and said filament arranged in substantially circular fashion around said cord directly next thereto and substantially concentric therewith so as to completely encircle the same with the filament disposed on the outer side of said cord and being coextensive

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throughout the length thereof, said filament being deformed so as to provide spaced-apart interlocking means therealong, said weft thread being interwoven with said last warp threads and extending around both said cord and said filament.

6. In a stringer for a slide fastener, a plurality of longitudinally extending warp threads, a continuous weft thread interwoven back and forth through and between said warp threads so as to provide a woven web, a marginal edge portion arranged along one side of said web consisting of a single longitudinally extending cord having a plurality of longitudinally extending warp threads together with a continuous coiled filament disposed therearound, both of said last warp threads and said filament arranged in substantially circular fashion around said cord directly next thereto and substantially concentric therewith so as to completely encircle the same with the filament disposed on the outer side of said cord and being coextensive throughout the length thereof, each of the convolutions of said coiled filament being deformed so as to provide interlocking means thereon, said weft thread being interwoven with said last warp threads and extending around both said cord and the convolutions of said coiled filament.

7. In a stringer for a slide fastener, a plurality of longitudinally extending warp threads, a continuous weft thread interwoven back and forth through and between said warp threads so as to provide a woven web, a marginal edge portion arranged along one side of said web consisting of a single longitudinally extending cord having at least eight longitudinally extending warp threads, four on each side, together with a continuous filament disposed therearound, both of said last warp threads and said filament arranged in substantially circular fashion around said cord directly next thereto and substantially concentric therewith so as to completely encircle the same with the filament disposed on the outer side of said cord and being coextensive throughout the length thereof, said filament being deformed so as to provide spaced interlocking means therealong, said weft thread being interwoven with said last warp threads and extending around both said cord and said filament.

8. In a stringer for a slide fastener, a plurality of longitudinally extending warp threads, a continuous weft thread interwoven back and forth through and between said warp threads so as to provide a woven web, a marginal edge portion arranged along one side of said web consisting of a single longitudinally extending cord having at least eight longitudinally extending warp threads, four on each side together with a continuous coiled filament disposed therearound, both of said last warp threads and said filament arranged in substantially circular fashion around said cord directly next thereto and substantially concentric therewith so as to completely encircle the same

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with the filament disposed on the outer side of said cord and being coextensive throughout the length thereof, each of the convolutions of said filament being deformed so as to provide interlocking means thereon, said weft thread being interwoven with said last warp threads and extending around both said cord and the convolutions of said filament.

9. In a stringer for a slide fastener, a woven tape consisting of a plurality of longitudinally extending warp threads, a single elongated relatively large cord arranged along one side of said warp threads, a plurality of additional warp threads arranged around said cord, a continuous elongated pre-formed fastener filament arranged along said cord, both said last warp threads together with said filament arranged circumferentially around said cord and substantially concentric therewith so as to completely encircle the same with one side of the filament disposed directly next to the cord on the outer side thereof and being coextensive throughout the length thereof, a continuous weft thread interwoven back and forth through and between said first and second warp threads so as to bind securely said filament to the outer side of said cord and said second warp threads and so as to provide an elongated beaded edge inwardly of said filament and directly next thereto.

10. In a stringer for a slide fastener, a woven tape consisting of a plurality of longitudinally extending warp threads, a single elongated relatively large cord arranged along one side of said warp threads, a continuous elongated pre-formed coiled filament arranged along the outer side of said cord so that the series of convolutions thereof are disposed directly next thereto, a plurality of additional warp threads arranged around said cord to the inner side of said filament, both said last warp threads together with said filament arranged circumferentially around said cord and substantially concentric therewith so as to completely encircle the same, a continuous weft thread interwoven back and forth through and between said first and second warp threads and around the convolutions of said filament.

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