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COVERED WATERTIGHT SLIDE FASTENER

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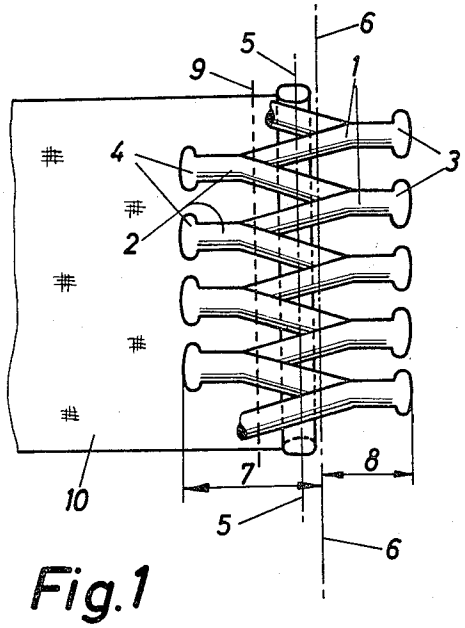


Fig.1

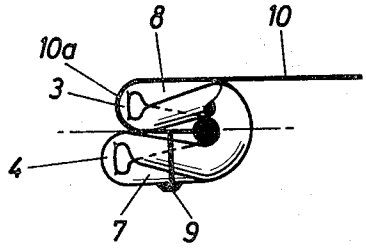


Fig.2

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COVERED WATERTIGHT SLIDE FASTENER

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Int. Cl. A44b 19/34

ABSTRACT OF THE DISCLOSURE

A slide-fastener half for a covered or watertight slide-fastener stringer in which a continuous synthetic-resin thread forms the coupling element and is bent in a uniform meander of figure-8 profile with respective rows of bights, coined and bent about a longitudinal axis of the meander between the body offset from the median longitudinal centerline whereby one set of bights projects beyond the other set of bights and the stringer tape is received between the bights and is stitched to the shanks or legs of the projecting set of bights, while the tape is turned back over the other set of bights whose coined heads are practically contiguous to form a continuous backing strip for the bend of the tape. A bead may be provided along the edge of the tape received between the sets of bights.

This invention relates to a covered or watertight slide fastener, in which two continuous chains of slide-fastener coupling links are made by depositing a plastic synthetic-resin thread in form of a meander and bending the same about a longitudinal line of the meander to the form of a U and securing the U-shaped meanders, each to a carrier ribbon or tape by straddling the edges of the carrier ribbons.

In known continuous chains of slide-fastener coupling links, made of a plastic thread in form of a meander, bent into a U-shape, the legs of the meander were hitherto provided with coined coupling surfaces along their longitudinal center line, whereupon the meander is bent to a U about this center line, and is placed in straddling fashion over one edge of a carrier tape, to which it is secured by sewing, so that the coupling surfaces are disposed along a line extending in parallel relation to the edge of the carrier ribbon at the apex of the U-shaped meander. These types of U-shaped meander-like rows of coupling links, which are secured to a carrier ribbon, cannot be formed as covered or watertight slide fasteners without further measures, unless special carrier ribbons or cover strips sewed, are used.

The object of this invention is to provide a slide-fastener stringer by using customary carrier ribbons, or carrier ribbons with a beaded edge respectively, and rows of coupling links made out of a synthetic-resin thread in form of a bent U-shaped meander, which may be used immediately as a covered or watertight slide fastener.

For accomplishing this task the invention provides that, in a slide fastener as mentioned above, each row of coupling links consists of a synthetic thread deposited in form of a meander with the profile of a recumbent figure-8, the return bends of which are disposed in planes perpendicular to the longitudinal direction of the row of links and being provided with coupling surfaces at least at one row of the bights of the figure 8, and that said meander is bent around the edge, or the beaded edge respectively, of the carrier ribbon along a line shifted in parallel relation to said longitudinal centerline between the bights wherein the carrier ribbon prior to the U-shaped bending of said meander is sewed, bonded or fused to the longer set of legs of the U-shaped meander which is effecting the coupling,

and the carrier ribbon is then bent back around the shorter leg.

Advantageously the bending line of said meander is shifted about at least the thickness of the carrier ribbon in parallel relation with respect to said longitudinal center line in such a manner that the opposed bends of the carrier ribbons of the two coupled slide fastener halves contact one another, or if elastic, watertight carrier ribbons are used are elastically urged against each other.

It will be noted that, according to the invention a specially formed meander is used, and is simply bent in U-shaped fashion around the edge of a carrier ribbon, in which, however, coined coupling surfaces are provided at all of the return bends of the meander, and not at the bend of the meander, and in which the bending line of the meander is offset whereby, upon bending the carrier ribbon backwardly, the longer legs of the U-shaped meander project beyound the bend of the tape, and the individual return bends of these legs form the coupling heads, while the shorter legs backed the inner surface of the backwardly bent carrier ribbon; a substantially continuous backing edge is thus formed for the ribbon bend by the practically contiguous heads or return bends of the meander of the shorter U-legs which also are provided with coined coupling surfaces, which are widening the plastic material thread in the individual bends in longitudinal direction of the row of links.

Thus a covered slide fastener is obtained in a simiple manner by means of two rows of coupling links in form of a U-shaped meander which are secured each to a carrier ribbon to a straddling fashion. If carrier ribbons made of watertight material such as elastomeric material, are used, then it is possible to bring the two bends of the pair of carrier ribbons into tight and elastic contacting engagement, by pulling the two slide fastener halves with the aid of a slide directly together, thereby making the slide fastener watertight. By means of the coupling surfaces or coinings on the return bends of the shorter U-legs a practically continuous backing edge of the watertight carrier ribbons is obtained, so that no undulations or creases can form which might influence the tightness of the slide fastener.

One embodiment of the invention is shown in the drawing in the form of one slide-fastener half; in the drawing:

FIG. 1 is a partial top view of a plastic thread in the form of a meander forming an intermediate step of a row of slide-fastener coupling links; and

FIG. 2 shows the connection of the U-shaped row of coupling links according to FIG. 1 with a carrier ribbon.

According to the invention, a thread of plastic material is laid in the shape of a meander corresponding to FIG. 1. This meander has a cross sectional shape of a recumbent figure 8, in which the return bends 1 and 2 are arranged on either side of the meander and are provided on both sides with coined coupling surfaces 3 and 4. This meander is bent to form a U about a line 6 being shifted in parallel relation to the dashed longitudinal center line 5, wherein preferably the longer legs 7 are secured to a carrier ribbon 10 by bonding or fusing. Subsequently to this securing step, the meander is bent to the U-shape about the eccentric bending line 6 in such a manner that one edge of the carrier ribbon, or a bead of this carrier ribbon respectively, is straddled by the legs of the U. Then the carrier ribbon 10 is bent back about the shorter leg of the U-shaped meander. But it is also possible to operate in such a manner that the meander, as shown in FIG. 1, is bent to the U-shape about the eccentric bending line 6, and is then stabilized, whereby the legs of the U form a resilient spring with relation to each other. Then the bead of a carrier ribbon may be urged between the legs of the U, whereupon also an additional sewing, bonding, or the like, is possible.

The eccentric bending line **6** is offset at least about the thickness of the carrier ribbon **10** with respect to the longitudinal center line **5**, whereby the exposed legs of the coupling element with their coined coupling surfaces **4** may be brought into coupling engagement with the corresponding coupling surfaces of a second inverse slide fastener half by a slide. By means of this coupling engagement between the two slide fastener halves and the carrier ribbons **10** bent about 180° about the shorter legs **8** of the U-shaped meander the apexes **10***a* of the carrier ribbon come into contacting, or substantially into contacting engagement, when the two slide fastener halves are pulled together, whereby the slide fastener is covered by the two carrier ribbons **10** and is not visible anymore from the outside. The coupling surfaces or heads **3** of the shorter legs **8** of the U-shaped meander widen the return bends **1** in longitudinal direction of the slide fastener thus forming a substantially contiuous backing edge for the apexes **10***a* of the bends of the carrier ribbons **10**.

It will be appreciated that according to the invention carrier ribbons **10** made of watertight material, or elastomeric watertight material respectively, may be used in this embodiment in such a manner that the apexes **10***a* of the two slide fastener halves, when drawn together by a slide, are elastically urged against each other, whereby the slide fastener becomes completely watertight. Also in this case, the coupling surfaces of the shorter legs **8** of the U form a substantially continuous backing edge, thus achieving a substantially constant contact pressure against the apexes **10***a* of the return bends of the two carrier ribbons over the entire length of the slide fastener, whereby the tightness is no longer influenced contrarily.

What I claim is:

1. In a slide-fastener stringer, a slide-fastener half comprising a stringer tape having a longitudinally extending edge, and a continuous synthetic-resin coupling element mounted along said edge for engagement with a corresponding coupling element of the other slide-fastener half, said coupling element having a uniform meandering configuration with a median longitudinal axis of symmetry and a multiplicity of meanders each with a pair of bights on opposite sides of said axis, said coupling element being bent about said edge and about an axis parallel to but offset from said median longitudinal axis in generally U profile with one set of bights projecting beyond the other set of bights and said sets of bights straddling said edge of said tape, said tape being turned back about said other set of bights to envelop same at a bend of the tape formed along said element.

2. The slide-fastener defined in claim **1** wherein said element has the profile of a distorted figure **8** and said one of said sets of bights has relatively long legs affixed to said tape and said other set of bights has relatively short legs covered by said tape.

3. The slide fastener defined in claim **1** wherein the axis of the bend at said element is offset from the median longitudinal axis of the element by a distance of at least the thickness of said tape, and the bend of said tape is constructed so as to bear against the bend of the tape of said other slide-fastener half.

4. The slide fastener defined in claim **1** wherein said sets of bights are resiliently spreadable and retain said edge of said tape at least partly by springlike pressure thereagainst.

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U.S. Cl. X.R.

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