United States Patent

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[54] **ROW OF FASTENER ELEMENTS FOR A SLIDE**

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[51] **Int. Cl.**.....**A44b 19/12,** A44b 19/34

[58] **Field of Search**.24/208.1 C, 205.13 C, 205.16 C

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[57] **ABSTRACT**

A row of fastener elements for a slide fastener comprises a continuous spiral-shaped thread having a varying pitch, each whorl of the spiral thread having two legs which are substantially superimposed, and each whorl being separated from each other whorl, each whorl having at a first end portion thereof a deformation to serve as a tooth of a fastener element. In such a construction, the connecting sections between the successive whorls, opposite the teeth, each have a respective bend facing towards the teeth and the totality of said bends forms a series of notches along the corresponding longitudinal edge of the row of fastener elements. When the row of fastener elements is secured by stitching onto a backing tape, the stitching consists of two parallel longitudinal rows, one of said rows being at an intermediate point in the space between the teeth and the connecting sections, preferably close to the connecting sections, and the other being along the edge of the row of fastener elements opposite to the teeth and disposed inside the notches. Advantageously, the stitching is double chain-stitch made with two needles, the chains being positioned over the end of the whorls opposite to the teeth.

2 Claims, 3 Drawing Figures

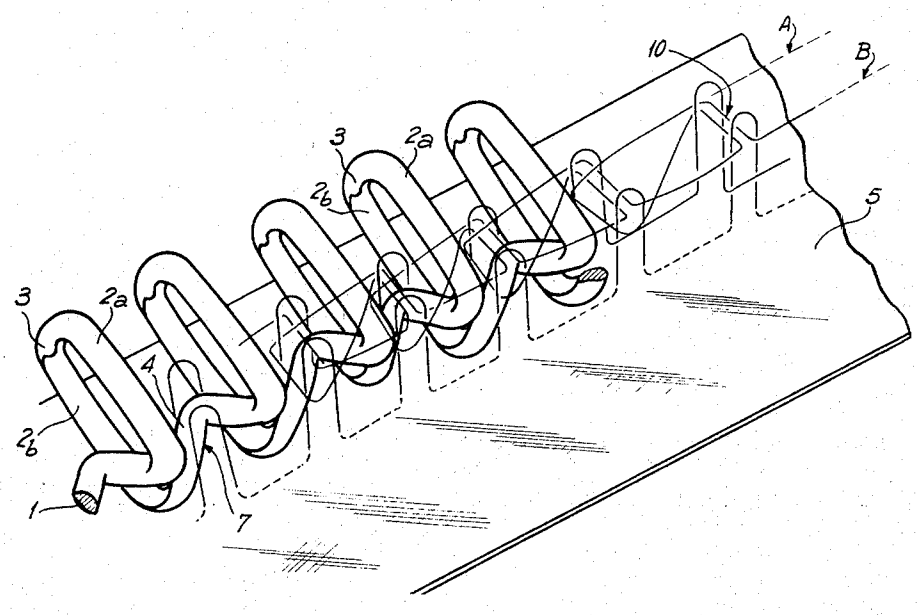


Fig. 2

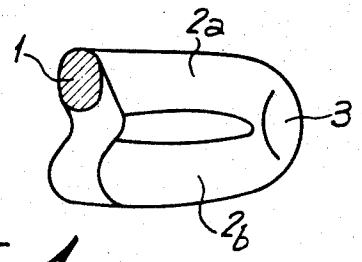
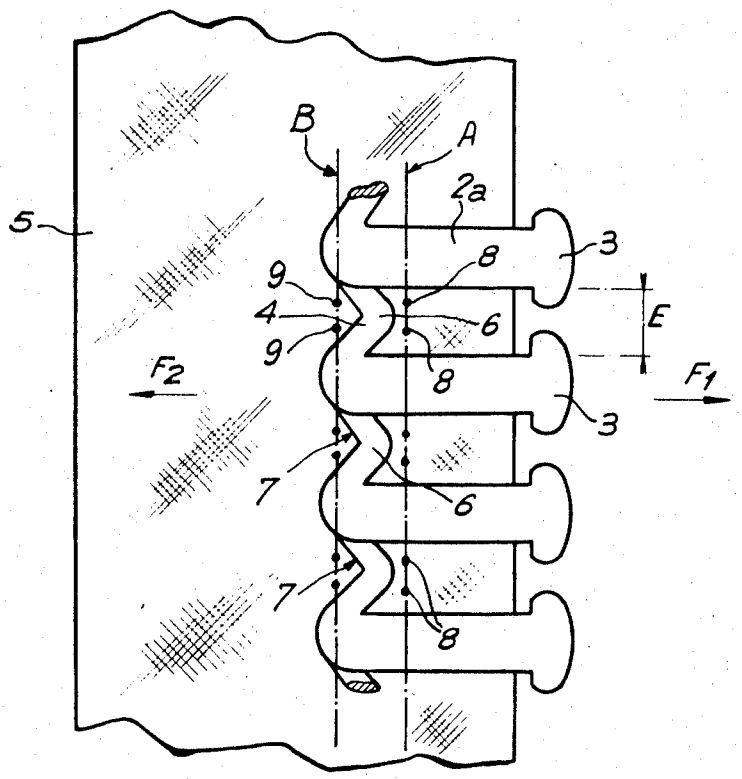


Fig. 1



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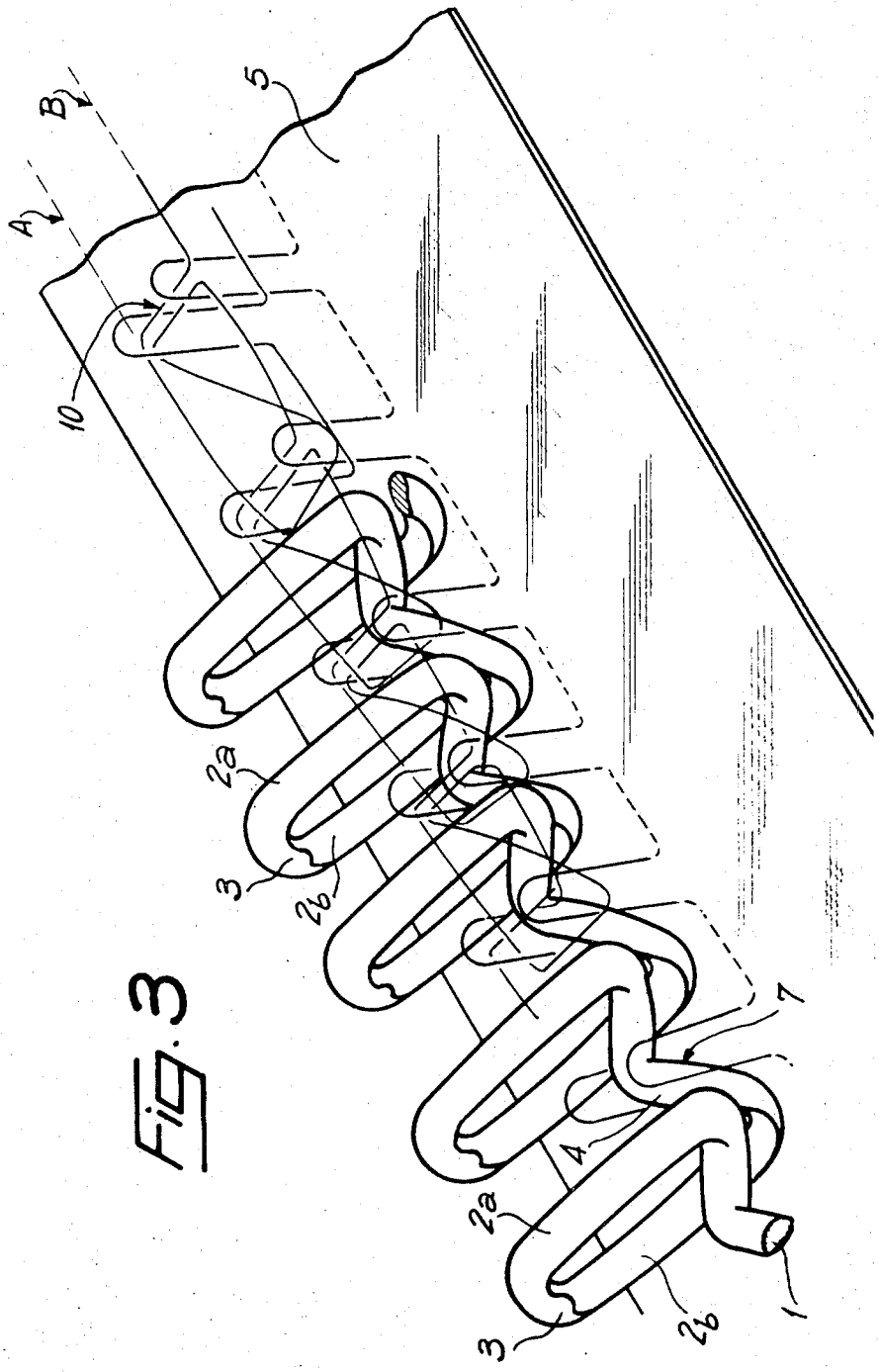

Fig. 3

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ROW OF FASTENER ELEMENTS FOR A SLIDE

This invention relates to slide fasteners of the type wherein each of the two rows of fastener elements is made up of a spiral-shaped continuous thread fixed by sewing on to a backing tape.

In a fastener of this kind, the teeth of the fastener elements in each row generally consist of a deformation at the end of each whorl of the spiral, on the side facing the other row of fastener elements. This deformation may with advantage consist of a flattening of the section of the thread.

However, fixing each spiral in place on the backing tape by means of a longitudinal seam gives rise to certain difficulties of a technical nature. It must be easy to do this fixing, even in the case of very small fasteners. It is therefore necessary for the sewing needles to be able easily to enter between the successive whorls of the spiral. For this purpose, the latter is usually designed with a varying pitch, so that the two legs of each whorl are substantially superimposed in the same plane perpendicular to the backing tape and the respective whorls are separated from one another so that the sewing needles can easily enter between them.

Moreover, various methods have already been devised to fix each spiral firmly to its backing tape.

One of the solutions recommended for this purpose consists of fitting a thin cord inside each spiral and stitching the latter through the former. In these circumstances, the spiral is firmly fixed and cannot come loose by slipping under the stitches.

Nevertheless, this solution obviously complicates the manufacture of the fastener units. Moreover, the presence of the thin cord inside each spiral does not allow the whorls to be flattened completely to obtain a neat, not-very-visible fastener.

Another solution used to ensure the firm fixing of each spiral consists of making the whorls in a special shape, so that they cannot come loose by slipping under the stitches. In view of the fact that the whorls could only slip towards the side opposite to the teeth, the whorls can then be flattened at the place where the stitching is, and be of a certain height on the side of the teeth. The result is a special shape of whorl which eliminates any chance of the spiral slipping under the stitching. Nevertheless, this solution is not entirely satisfactory as, here again, it is impossible to achieve flattened spirals so as to obtain a neat and not-very-visible fastener.

It is accordingly the object of this invention to provide a row of linking elements of the type in question, so constructed that the corresponding spiral can be flattened and, nevertheless, firmly fixed to its backing tape.

For this purpose, this row of fastener elements is essentially characterized in that, on the side opposite to the teeth, the connecting sections between the successive whorls each have a bend pointing towards the teeth, these bends forming a series of notches along the corresponding longitudinal edge of this row of fastener elements.

These notches enable the latter to be fixed by means of an extra row of stitching, the stitches of which are positioned inside the said notches and thus on the outside of the connecting sections between the different whorls. This enables the spiral to be firmly fixed because, additionally, a row of stitching is provided in the usual place, i.e., at an intermediate point in the width between the teeth and the connecting sections on the other side.

This invention also concerns a slide fastener unit consisting of a row of fastener elements as defined above and which is fixed on to its backing tape by means of two rows of stitching so positioned.

Other features and advantages of the invention will be apparent from the following description with reference to the accompanying drawing, given by way of example, and wherein:

FIG. **1** is a diagrammatic view from above of a fastener unit in accordance with the invention;

FIG. **2** is a cross-sectional view of the row of fastener elements forming part of this fastener unit;

FIG. **3** is a diagrammatic perspective view of a particular embodiment of this unit.

As already mentioned, the row of fastener elements included in this fastener unit is made up, in the known way, of a continuous thread **1**, made for example of synthetic resin, which is spiral-shaped. However, the latter has a varying pitch, so that the two legs **2***a* and **2***b* of each whorl are substantially superimposed in the same plane perpendicular to that of the tape **5** on which this spiral is to be fixed.

This enables a gap E to be obtained between two successive whorls of the spiral so as subsequently to be able easily to insert the stitches fixing the latter on to the backing tape.

The teeth of the linking components consist, in known manner, of a flattening **3** formed at the end of each whorl and designed to be turned towards the other row of fastener elements.

At the opposite end, the various successive whorls are connected to one another by connecting sections **4**, which are of course at an angle in relation to the plane of the backing tape **5** on which the spiral is to be fixed.

However, in accordance with an essential feature of the invention, each of these connecting sections **4** comprises a bend **6** projecting towards the teeth **3**. These different bends thus form, on the opposite side, a series of notches **7** positioned between the various successive whorls. These notches are thus positioned along the longitudinal edge of the spiral which is on the side opposite to the teeth.

The row of fastener elements so formed is fixed on to a backing tape **5** by stitching. However, in accordance with another essential feature of the invention, this fixing is effected by two separate rows of stitching, the positioning of which is shown by the dot-and-dash lines A and B.

The first of these, i.e., row of stitching A, is positioned in the usual place, thus at an intermediate point in the width of the spiral, between the teeth **3** and the connecting sections **4** between the whorls.

This row of stitching is made by inserting the sewing needle through the tape in the space E_1 between two successive whorls. Thus in the example shown in FIG. **1**, two needle insertion points **8** are provided in each of these spaces.

This first row of stitching thus anchors the two legs **2***a* and **2***b* of each whorl to the backing tape **5**. However, the very positioning of this row of stitching also prevents the spiral from sliding sideways under the stitches in the direction F_1.

As regards the second row of stitching B, it is positioned in a quite unusual place, which is in fact an important innovation in the invention.

This row in fact goes over the ends of the whorls on the side opposite to the teeth **3**. This is made possible by the presence of the notches **7** formed by the bends **6** provided in the connecting sections between the whorls. The sewing needle can then be inserted inside each of these notches. Thus, in the example shown in FIG. **1**, two needle insertion points **9** through the tape **5** are provided inside each notch **7**.

From its very design, this second row of stitching prevents the spiral from slipping sideways in the direction of the arrow F_2. The loops formed by this row of stitching are in fact positioned over the end of the whorls opposite the teeth **3**, while the insertion points **9** going through the tape **5** are on the outside of the spiral, inside the notches **7**.

This enables the row of fastener elements to be firmly fixed on the backing tape **5**, without having to provide a thin cord inside the spiral or impart any special shape to the section of the whorls of the latter. In these circumstances, it is thus possible to flatten the whorls of the spiral over the whole of the latter's width, so as to form a fastener which is as flat as possible, in order not to show much and be very neat.

While the shape of such a cross section cannot in itself stop the spiral slipping in the corresponding direction, this is achieved, in the present case, by the two rows of stitching A and B positioned on each side of the connecting sections **4** connecting the successive whorls.

It should be noted that these two rows of stitching can be completely independent of each other, as is the case in the example shown in FIG. **1**. Nevertheless, it is also possible to provide a connection between these two rows of stitching.

Thus, in an advantageous embodiment, shown in FIG. **3**, these can consist of a double chain-stitch **10**, achieved by means of two needles. This chain-stitch is obtained by providing for the insertion points of the two needles to be positioned along two parallel lines A and B, so that the positioning is the same as the insertion points **8** and **9** shown in the diagrammatic view in FIG. **1**. However, it is then possible to arrange for the chains of these stitches to be formed over the end of the whorls on the side opposite the teeth **3**, midway between the two rows A and B. This makes it possible to fix the row of linking components even more firmly to the corresponding backing tape **5**.

It will be obvious that the fastener unit in accordance with the invention is not limited to the constructional examples which have been described above by way of example. For instance the stitches used to fix the spiral could be of a different kind, providing their position remains the same. It would thus be possible to use a zig-zag stitch.

This fastener unit is of course designed to be associated with an identical unit to form a slide fastener fitted with a slide and the usual stops at the two ends.

The fastener so obtained has the advantage of being very strong, since the two rows of fastener elements cannot under any circumstances come loose by slipping sideways under the stitches of the fixing seam.

This fastener also has the advantage of being very neat since the whorls formed by the two rows of fastener elements can be completely flattened over the whole of their width.

I claim:

1. A row of slide fastener elements to be secured to a backing tape of soft material, comprising a continuous spiral-shaped thread having a varying pitch, each convolution of the spiral thread having two legs which are substantially super-imposed, and each convolution being separated from each other convolution, each convolution having at a first end portion thereof a deformation to serve as a tooth of a fastener element, connecting sections between the successive convolutions opposite the teeth each have a respective bend facing towards the teeth, the totality of said bends forming a series of notches along the corresponding longitudinal edge of the row of fastener elements, means to secure said row of slide fastener elements, by stitching, onto said backing tape, said stitching comprising two parallel longitudinal rows of stitches, a first said row of stitches being located close to said connecting sections of said convolutions and being disposed at an intermediate point in the space between the teeth and the connecting sections, and a second said row of stitches being disposed along the edge of the row of fastener elements opposite the teeth, the stitches of said second row being located inside said notches constituted by said bends in said connecting sections of said convolutions.

2. A unit as claimed in claim **1**, wherein said two rows of stitching consist of double chain-stitch made with two needles, the chains thereof being positioned over the end of said convolutions of said spiral opposite to said teeth.

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