

# PATENT SPECIFICATION

DRAWINGS ATTACHED

879,319



*Date of Application and filing Complete Specification :*  
March 19, 1958.

*No.* 8869/58.

*Application made in Germany on March 28, 1957.*

*Complete Specification Published October 11, 1961.*

**Index at Acceptance: Class 44, BE4E.**

**International Classification: A44b.**

## Improvements in or relating to sliding clasps.

### COMPLETE SPECIFICATION

I, JOSEF RUHRMANN, of German nationality, of Bahnhofstrasse 24, Stuttgart-Vaihingen, Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to sliding clasp fasteners and is more specifically concerned with the construction of a string of locking elements for such fasteners formed from a continuous filamentary length of material.

A string of locking elements may be manufactured in a continuous length from a synthetic thread which is suitably formed into a succession of alternate locking elements and spacing members. For forming a sliding clasp fastener, opposing pairs of such strings are stitched or otherwise secured to tape-like carriers, a suitable slider being provided for opening and closing the fastener.

When strings of locking elements are formed from fine material, it may be difficult securely to guide the slider along opposing strings when operating the fastener. This difficulty may be increased when the two strings of a fastener are completely separable from each other. In such a case, the end of one of the strings has to be threaded through the slider before closing the fastener and, to allow for such threading, an entrance opening in the slider is sometimes enlarged, causing the slider not properly to be guided along the strings.

The invention consists in a string of locking elements for a sliding clasp fastener, comprising a filamentary length of material formed into a succession of transverse locking elements and longitudinal spacing members, each locking element being generally in the shape of a U having limb portions, each two adjacent locking elements being

joined by a spacing member bridging the ends of two limb portions of the said locking elements, the spacing members and/or limb portions of the locking elements being provided with deformations transversely of the string so as to facilitate guiding a slider along the string when operating a sliding clasp fastener incorporating the string.

The deformations may be constituted by the spacing members and ends of the limb portions being splayed outwards. Alternatively, the deformations may be constituted by the spacing members being of trapezoidal cross-section, the narrow side of the parallel sides adjoining the respective limb portions. Still alternatively, the deformations may be constituted by the ends of the limb portions of each U being bent outwards at right angles. Yet alternatively, the deformations may be constituted by each limb portion being bent outwards back upon itself. Alternatively, the deformations may be constituted by each limb of each U being bent inwards back upon itself. Still alternatively, the deformation may be constituted by the spacing members being elongated transversely of the string.

The invention also embraces a string of locking elements as hereinbefore defined, when stitched to a tape-like carrier. The carrier may be straddled by the locking elements. A cover may be provided externally of the limb portions.

To make the invention clearly understood, reference will now be made to the accompanying drawings, which are given by way of example and in which:—

Fig. 1 shows a U-shaped locking element, the ends of limb portions of the U and spacing members being splayed apart;

Fig. 2 shows a modified locking element joined to spacing members which are elongated transversely;

Fig. 3 shows a modified locking element joined to spacing members of trapezoidal

(Price 3s. 6d.)

cross-section;

Fig. 4 shows a modified locking element, together with part of a slider in which the ends of the limb portions of the U-shaped elements are bent outwards;

Fig. 5 shows a modified U-shaped locking element in which the ends of the limb portions of the U are bent outwards and back against the limb portions; and

Fig. 6 shows a modified U-shaped locking element in which the ends of the limb portions of the U are bent inwards and back against the limb portions.

Fig. 1 illustrates a locking element for a sliding clasp fastener. The locking element 1 is generally in the shape of a U having limb portions. The locking element 1 forms part of a string of locking elements. A generally similar string of locking elements has been disclosed in my patent specification No. 821,341. The string comprises a filamentary length of material formed into a succession of transverse locking elements and longitudinal spacing members. Each two adjacent locking elements of Fig. 1 are joined by a spacing member 11 bridging the ends of two limb portions of the said locking elements.

The string of locking elements 1 straddles a carrier 4 and is held thereon by stitches 5 (only one being shown in Fig. 1) which pass through the carrier 4 and through covering braidings 3 provided at the outside of the string. The ends of the limb portions of the U and the spacing members 11 are provided with deformations constituted by the ends of the limb portions and the spacing members 11 being splayed outwards so that the spacing members 11 are spaced from the carrier 4. The locking element immediately adjacent the element 1 in the direction above the plane of the drawing is joined to the element 1 by the upper one of the spacing members 11, while the other spacing member 11 joins the locking element 1 to its neighbour below the plane of the drawing. By the splaying of the ends of the limb portions and the spacing members 11, guiding of a slider along the string is facilitated when operating a sliding clasp fastener incorporating the string. The overall distance of the spacing members 11 from outside to outside thereof is increased by the splaying.

The locking element of Fig. 2 is generally similar to that of Fig. 1, except that in addition to the splaying apart, the ends of the limb portions of the U and the spacing members 111 are in cross-section elongated in the direction perpendicular to the carrier 4. Thereby the overall distance of the spacing members 111 from outside to outside is increased as compared with the locking element of Fig. 1. The locking element is again attached to the carrier 4 by stitches 5 and is provided with covering braidings 3.

The locking element 1 of Fig. 3 is, again, similar to that of Fig. 1 except that only the spacing members 112 are deformed by being of trapezoidal cross-section with the narrow one of its parallel sides adjacent the respective ends of the limb portions of the U. In this embodiment the limbs are not splayed apart, the trapezoidal cross-section of the spacing members providing an increased overall distance between the spacing members 112 from outside to outside. It will be observed that the edges of the spacing members 112 grip the carrier 4, and that the thickness of the carrier 4 may be greater within the U than outside the U. The locking element 1 is attached to the carrier 4 by stitches 5 and covering braidings 3 are provided at the outside of the element.

In the modification of Fig. 4, the ends of the limb portions of the U-shaped locking element 1 are not splayed outwards at acute angles to the carrier 4, but are bent away from the carrier 4 at right angles, the spacing members being indicated by reference numeral 113. In this figure, part of a slider 6 is shown, together with part of its pull member 62. The slot in the slider, where it passes over the carrier 4, is shown as being wider than the thickness of the carrier 4 and, but for the bending of the ends of the limb portions, the slider would bear against only about half the thickness of the material of the string, whereas as illustrated the bearing surfaces are increased in width.

In the modification illustrated in Fig. 5, the limb portions of the U-shaped locking element 1 are bent back outwards upon themselves so that the carrier 4 is straddled between the limb portions as in the previous described embodiments. The carrier 4 is attached to the locking elements by stitches 5, the coverings of the previous embodiments being omitted.

The modification of Fig. 6 is similar to that of Fig. 5 except that the limb portions of the locking element 1 are bent inwards back upon themselves, the carrier 4 being straddled by the inturned parts of the limb portions.

#### WHAT I CLAIM IS:—

1. A string of locking elements for a sliding clasp fastener, comprising a filamentary length of material formed into a succession of transverse locking elements and longitudinal spacing members; each locking element being generally in the shape of a U having limb portions, each two adjacent locking elements being joined by a spacing member bridging the ends of two limb portions of the said locking elements, the spacing members and/or limb portions of the locking elements being provided with deformations transversely of the string so as to facilitate guiding a slider along the string when operating a sliding clasp fastener in-



cross-section;

Fig. 4 shows a modified locking element, together with part of a slider in which the ends of the limb portions of the U-shaped elements are bent outwards;

Fig. 5 shows a modified U-shaped locking element in which the ends of the limb portions of the U are bent outwards and back against the limb portions; and

Fig. 6 shows a modified U-shaped locking element in which the ends of the limb portions of the U are bent inwards and back against the limb portions.

Fig. 1 illustrates a locking element for a sliding clasp fastener. The locking element 1 is generally in the shape of a U having limb portions. The locking element 1 forms part of a string of locking elements. A generally similar string of locking elements has been disclosed in my patent specification No. 821,341. The string comprises a filamentary length of material formed into a succession of transverse locking elements and longitudinal spacing members. Each two adjacent locking elements of Fig. 1 are joined by a spacing member 11 bridging the ends of two limb portions of the said locking elements.

The string of locking elements 1 straddles a carrier 4 and is held thereon by stitches 5 (only one being shown in Fig. 1) which pass through the carrier 4 and through covering braidings 3 provided at the outside of the string. The ends of the limb portions of the U and the spacing members 11 are provided with deformations constituted by the ends of the limb portions and the spacing members 11 being splayed outwards so that the spacing members 11 are spaced from the carrier 4. The locking element immediately adjacent the element 1 in the direction above the plane of the drawing is joined to the element 1 by the upper one of the spacing members 11, while the other spacing member 11 joins the locking element 1 to its neighbour below the plane of the drawing. By the splaying of the ends of the limb portions and the spacing members 11, guiding of a slider along the string is facilitated when operating a sliding clasp fastener incorporating the string. The overall distance of the spacing members 11 from outside to outside thereof is increased by the splaying.

The locking element of Fig. 2 is generally similar to that of Fig. 1, except that in addition to the splaying apart, the ends of the limb portions of the U and the spacing members 11 are in cross-section elongated in the direction perpendicular to the carrier 4. Thereby the overall distance of the spacing members 11 from outside to outside is increased as compared with the locking element of Fig. 1. The locking element is again attached to the carrier 4 by stitches 5 and is provided with covering braidings 3.

The locking element 1 of Fig. 3 is, again, similar to that of Fig. 1 except that only the spacing members 112 are deformed by being of trapezoidal cross-section with the narrow one of its parallel sides adjacent the respective ends of the limb portions of the U. In this embodiment the limbs are not splayed apart, the trapezoidal cross-section of the spacing members providing an increased overall distance between the spacing members 112 from outside to outside. It will be observed that the edges of the spacing members 112 grip the carrier 4, and that the thickness of the carrier 4 may be greater within the U than outside the U. The locking element 1 is attached to the carrier 4 by stitches 5 and covering braidings 3 are provided at the outside of the element.

In the modification of Fig. 4, the ends of the limb portions of the U-shaped locking element 1 are not splayed outwards at acute angles to the carrier 4, but are bent away from the carrier 4 at right angles, the spacing members being indicated by reference numeral 113. In this figure, part of a slider 6 is shown, together with part of its pull member 62. The slot in the slider, where it passes over the carrier 4, is shown as being wider than the thickness of the carrier 4 and, but for the bending of the ends of the limb portions, the slider would bear against only about half the thickness of the material of the string, whereas as illustrated the bearing surfaces are increased in width.

In the modification illustrated in Fig. 5, the limb portions of the U-shaped locking element 1 are bent back outwards upon themselves so that the carrier 4 is straddled between the limb portions as in the previous described embodiments. The carrier 4 is attached to the locking elements by stitches 5, the coverings of the previous embodiments being omitted.

The modification of Fig. 6 is similar to that of Fig. 5 except that the limb portions of the locking element 1 are bent inwards back upon themselves, the carrier 4 being straddled by the inturned parts of the limb portions.

WHAT I CLAIM IS:—

1. A string of locking elements for a sliding clasp fastener, comprising a filamentary length of material formed into a succession of transverse locking elements and longitudinal spacing members, each locking element being generally in the shape of a U having limb portions, each two adjacent locking elements being joined by a spacing member bridging the ends of two limb portions of the said locking elements, the spacing members and/or limb portions of the locking elements being provided with deformations transversely of the string so as to facilitate guiding a slider along the string when operating a sliding clasp fastener in-

corporating the string.

2. A string of locking elements as claimed in claim 1, wherein the deformations are constituted by the spacing members and ends of the limb portions being splayed outwards.

3. A string of locking elements as claimed in claim 1, wherein the deformations are constituted by the spacing members being of trapezoidal cross-section, the narrow side of the parallel sides adjoining the respective limb portions.

4. A string of locking elements as claimed in claim 1, wherein the deformations are constituted by the ends of the limb portions of each U being bent outwards at right angles.

5. A string of locking elements as claimed in claim 1, wherein the deformations are constituted by each limb portion being bent outwards back upon itself.

6. A string of locking elements as claimed in claim 1, wherein the deformations are constituted by each limb of each U being bent inwards back upon itself.

7. A string of locking elements as claimed in claim 1, wherein the deformations are constituted by the spacing members being elongated transversely of the string.

8. A string of locking elements as claimed in any one of claims 1 to 7, when stitched to a tape-like carrier.

9. A string of locking elements as claimed in claim 8, wherein the carrier is straddled by the locking elements.

10. A string of locking elements as claimed in claim 8 or 9, wherein a cover is provided externally of the limb portions.

11. A string of locking elements for a

sliding clasp fastener, substantially as hereinafore described with reference to, and as illustrated in, Fig. 1 of the accompanying drawings.

12. A string of locking elements for a sliding clasp fastener, substantially as hereinafore described with reference to, and as illustrated in, Fig. 2 of the accompanying drawings.

13. A string of locking elements for a sliding clasp fastener, substantially as hereinafore described with reference to, and as illustrated in, Fig. 3 of the accompanying drawings.

14. A string of locking elements for a sliding clasp fastener, substantially as hereinafore described with reference to, and as illustrated in, Fig. 4 of the accompanying drawings.

15. A string of locking elements for a sliding clasp fastener, substantially as hereinafore described with reference to, and as illustrated in, Fig. 5 of the accompanying drawings.

16. A string of locking elements for a sliding clasp fastener, substantially as hereinafore described with reference to, and as illustrated in, Fig. 6 of the accompanying drawings.

17. A sliding clasp fastener comprising a string of locking elements as claimed in any one of claims 1 to 16.

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