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METHOD OF MANUFACTURING SLIDING CLASP FASTENERS

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FIG. 1.

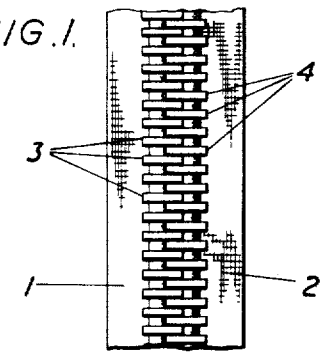


FIG. 2.

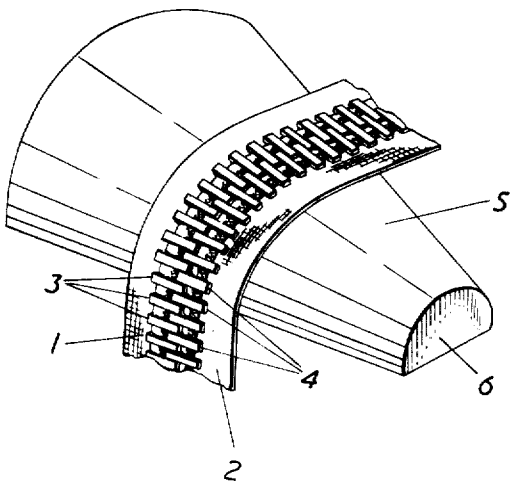
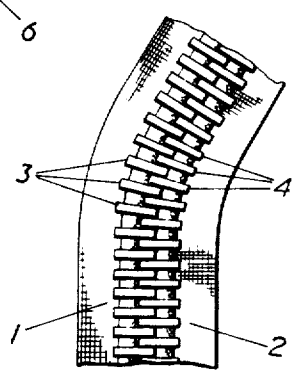


FIG. 3.



Inventor
Geoffrey Warburton and
William James Paul Clark
By Henry K. Feist
Attorney

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METHOD OF MANUFACTURING SLIDING CLASP FASTENERS

Geoffrey Warburton, Cardiff, and William J. P. Clarke, Glamorgan, Wales, assignors to Aero Zipp Fasteners Limited, London, England, a British company

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20 Claims. (Cl. 29—408)

The present invention relates to a method of making sliding clasp fasteners. For some purposes, for example in trouser flies, sliding clasp fasteners are used, the stringers of which (that is to say the fastener tapes provided with interlocking members) are curved in the general plane of the stringers. In order to obtain the desired curvature, it has been proposed to attach the interlocking members to the fastener tapes at distances between adjacent interlocking members which vary along the stringers and/or to vary the shape of the interlocking members along the stringers.

It is an object of the invention to provide a curved sliding clasp fastener without necessarily varying the spacing between adjacent interlocking members while attaching them to the fastener tapes and/or varying the shape of the interlocking members along the stringers.

It is another object of the invention to provide a method of curving a sliding clasp fastener after the interlocking members have been attached to the tapes.

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 illustrates a length of a pair of sliding clasp fastener stringers;

Fig. 2 is a somewhat diagrammatical perspective view of an arrangement for performing the method; and

Fig. 3 illustrates a pair of curved sliding clasp fastener stringers.

Fig. 1 of the drawings illustrates a length of a pair of stringers **1** and **2**, as they are normally produced in the manufacture of sliding clasp fasteners.

The two stringers **1** and **2** are interlocked with each other by interengaging the interlocking members **3** and **4** of the stringers **1** and **2**. Before or after the interlocking, a starching or sizing liquid, for example a synthetic starch of a semi-permanent nature consisting of an aqueous dispersion of a thermoplastic synthetic resin, such as a vinyl acetate polymer, is applied to the stringers **1** and **2** or a part thereof which has to be curved, and the interlocked stringers **1** and **2** are then tightly drawn around a heated conical surface **5** (see Fig. 2) of a mandrel **6** and while tensioned are held by suitable means (not shown) against the conical surface **5** for an appropriate period, to dry or partially to dry the stringers **2** and **3**, whereupon the said stringers are removed from the conical surface **5** and flattened out. The stringers **1** and **2** are now curved as shown in Fig. 3. For applying the starching or sizing liquid, the same may be sprayed onto the stringers, or the stringers may be dipped once or several times into a supply of the liquid.

By suitably choosing the sizing or starching liquid it can be achieved that the stringers **1** and **2** retain the curvature imparted thereto even if the sliding clasp fastener comprising the stringers is washed a few times. However, in some cases it may not be essential that the starching or sizing material remains effective after washing or dry cleaning. For example, when sliding clasp

fasteners are to be fixed to trouser flies, it may be immaterial whether the starching or sizing material does or does not retain their shape after washing or dry cleaning once they have been fixed to the trouser flies, since the trouser flies will retain the shape of the sliding clasp fasteners.

Modifications of the specific method described are possible. For example, a single stringer may be treated in a manner similar to that described with respect to the pair of stringers **1** and **2**. Again, the conical surface **5** may be replaced by any other suitably shaped curved surface. For instance, the curved surface may be ellipsoidal. The curved surface may be a closed curved surface in which case the stringer or stringers may be wound once or several times around the surface. The starching or sizing material may be applied, for example by spraying or dipping, after the stringers have been drawn or wound around the curved surface. Instead of drawing or winding the stringer or stringers tightly around the curved surface, they may be placed loosely against the same and may be shrunk onto the curved surface by wetting the stringer or stringers. Instead of using a liquid sizing or starching material, the stringer or stringers may be initially dry, but coated or impregnated with a sizing or starching material and may subsequently be wetted. The mandrel may be heated for accelerating the drying of the stringers. If desired, a former may be employed which has a concavely curved surface mating the curved surface of the mandrel **6** and which may be heated, the said former being, in use, pressed against the mandrel with the stringer or stringers sandwiched between the mandrel and the former whereby to apply pressure and/or heat (if the former and the mandrel are both heated) to the stringer or stringers from each side thereof.

Instead of using a starching or sizing material, a plastic material may be employed which, after the stringer or stringers have been curved, is caused to set, for example by the application of heat. The stringer or stringers may be coated or impregnated with the plastic material, or else threads of the plastic material may be woven into the stringers, the threads being responsive to the setting treatment. Such threads may be made of polyvinyl chloride.

It will be appreciated that the method may be applied to the stringer or stringers after the interlocking members have been attached to the carrying tapes. Thus, the method does not interfere with the usual methods of making sliding clasp fastener interlocking members and of attaching the same to the carrying tapes.

We claim:

1. A method of manufacturing a sliding clasp fastener which, at least in part, is curved in the general plane of the fastener stringers, comprising the steps of imparting a curvature to at least one of the stringers by stretching at least a part thereof, and applying a material to the said stringer which substantially maintains the curvature imparted to the stringer by the stretching.

2. A method of manufacturing a sliding clasp fastener, which at least in part, is curved in the general plane of the fastener stringers, comprising the steps of imparting a curvature to at least one of the stringers by shrinking at least a part thereof, and applying a material to the said stringer which substantially maintains the curvature imparted to the stringer by the shrinking.

3. A method of manufacturing a sliding clasp fastener which, at least in part, is curved in the general plane of the fastener stringers, comprising the steps of imparting a curvature to at least one of the stringers by deforming at least a part thereof, and applying a material to the said stringer which substantially maintains the curvature imparted to the stringer by the deformation.

4. A method as claimed in claim 3, wherein two string-

ers are interlocked with each other by interengaging their interlocking members, and the interlocked stringers or parts thereof are jointly deformed.

5. A method as claimed in claim 3, wherein the material applied to the stringer is a starching material.

6. A method as claimed in claim 5, wherein the starching material is a synthetic starch consisting of an aqueous dispersion of a thermoplastic synthetic resin.

7. A method as claimed in claim 6, wherein the thermoplastic synthetic resin is a vinyl acetate polymer.

8. A method as claimed in claim 3, wherein the material applied to the stringer is a sizing material.

9. A method as claimed in claim 3, wherein the material is applied by coating the stringer therewith.

10. A method as claimed in claim 3, wherein the material is applied by impregnating the stringer therewith.

11. A method of manufacturing a sliding clasp fastener which, at least in part, is curved in the general plane of the fastener stringers, comprising the steps of imparting a curvature to a stringer, in which a settable plastic material is incorporated, by deforming at least a part of the stringer, and causing the plastic material to set after the said stringer portion has been deformed, whereby to maintain the curvature imparted to the stringer by deformation.

12. A method as claimed in claim 11, wherein the stringer comprises threads made of the settable material.

13. A method as claimed in claim 12, wherein the threads are made of polyinyl chloride.

14. A method of manufacturing a sliding clasp fastener which, at least in part, is curved in the general plane of the fastener stringers, comprising the steps of stretching at least a portion of at least one of the stringers tightly around a convexly curved surface to curve the said stringer, and applying a material to the said stringer which substantially maintains a curvature of the stringer, subsequently removing the said stringer from the said surface, and flattening it out.

15. A method as claimed in claim 14, wherein the convexly curved surface is a conical surface.

16. A method as claimed in claim 14, wherein the convexly curved surface is heated.

17. A method of manufacturing a sliding clasp fastener which, at least in part, is curved in the general plane of the fastener stringers, comprising the steps of placing at least a portion of at least one of the stringers loosely around a convexly curved surface, wetting the said stringer to shrink it on to the said surface to curve the said stringer, and applying a material to the said stringer which substantially maintains a curvature of the stringer, subsequently removing the said stringer from the said surface, and flattening it out.

18. A method as claimed in claim 17, wherein the convexly curved surface is heated.

19. A method of manufacturing a sliding clasp fastener which, at least in part, is curved in the general plane of the fastener stringers, comprising the steps of stretching at least a portion of at least one of the stringers tightly around a convexly curved surface to curve the said stringer, and applying a material to the said stringer which substantially maintains a curvature of the stringer, placing a former having an auxiliary curved surface mating the first curved surface against the said stringer so that the said stringer is sandwiched between the first and the auxiliary curved surfaces, heating at least one of the said curved surfaces for a period of time, subsequently removing the said former, removing the said stringer, and flattening it out.

20. A method of manufacturing a sliding clasp fastener which, at least in part, is curved in the general plane of the fastener stringers, comprising the steps of placing at least a portion of at least one of the stringers loosely around a convexly curved surface, wetting the said stringer to shrink it on to the said surface to curve the said stringer, placing a former having an auxiliary curved surface mating the first curved surface against the said stringer so that the said stringer is sandwiched between the first and the auxiliary curved surfaces, heating at least one of the said curved surfaces to dry the stringer, subsequently removing the said former, removing the said stringer, and flattening it out.

No references cited.