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G. R. STONE

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METHOD OF MAKING SLIDE FASTENERS

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2 Sheets-Sheet 2

Fig. 4.

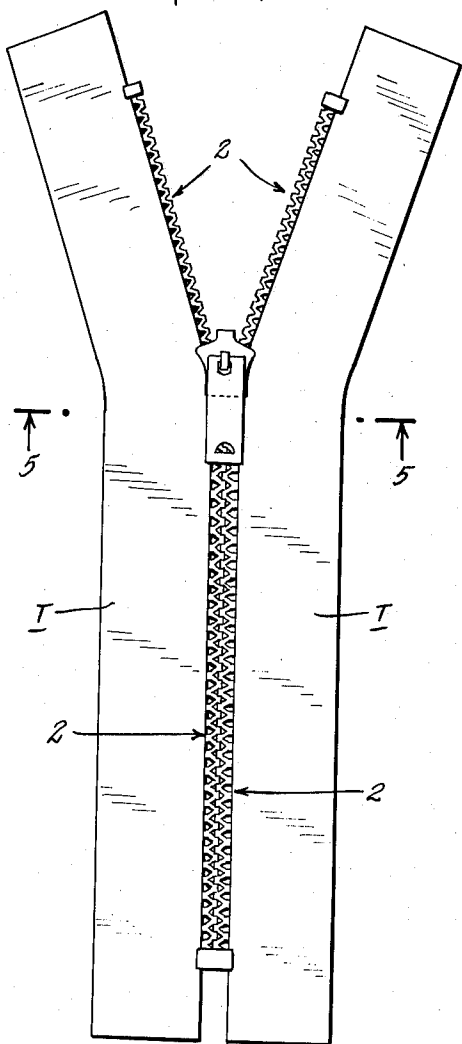


Fig. 6.

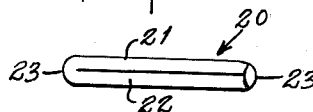


Fig. 7.

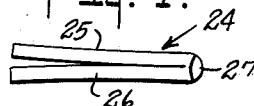


Fig. 8.

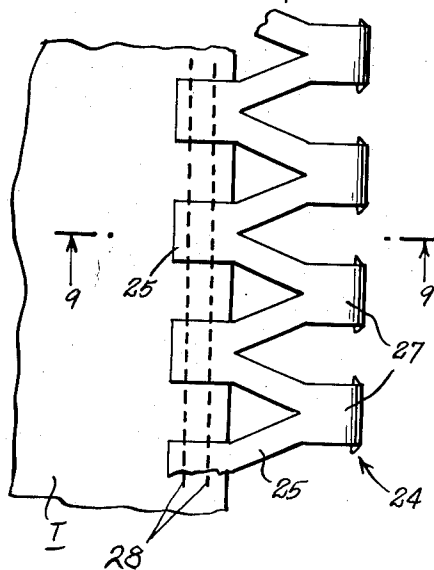


Fig. 5.

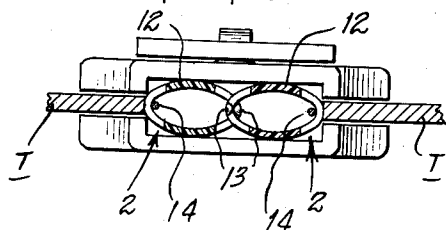
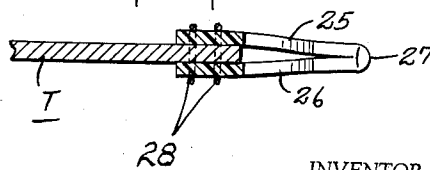


Fig. 9.



INVENTOR.
GEORGE R. STONE
BY *R. E. Meech*
ATTORNEY

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METHOD OF MAKING SLIDE FASTENERS

George R. Stone, Meadville, Pa., assignor to Talon, Inc.,
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This invention relates to a new and improved method of making slide fasteners.

Various types of plastic slide fasteners have been heretofore suggested and used but it was not until recently that they have become most prominent in the commercial trade, possibly due to the advent of new and better plastics. Some of such fasteners are of the pre-formed filament type. That is to say, the filament is formed so as to provide a continuous coiled filament or otherwise deformed so as to provide interlocking scoop formations therealong. The formed filament is attached to the edge of a stringer tape usually by sewing to complete the stringer. It is to such a pre-formed continuous coil type of fastener that the present invention relates.

In the practice of the present invention, the fastener is formed preferably from a continuous length plastic tubular member or from a strip of plastic material folded upon itself so as to provide two plies. One edge of the tubular member or folded material is slotted at spaced apart intervals along one edge thereof with the material then spread by inserting a suitable wedge-like tool in the slots so as to provide a series of spaced apart scoop forming portions which are deformed so as to provide interlocking means thereon. The opposite edge is also preferably similarly slotted at spaced apart intervals and the material also spread at the slots so as to provide means for attaching the formed tubular member or strip to the edge of a suitable stringer tape, preferably by stitching so as to provide a slide fastener stringer. The stringers are then cut to the desired length and interlocked with an opposed companion stringer and a slider assembled thereon so as to provide a complete slide fastener in a manner well known to those skilled in the art.

It is an object of the invention to provide an improved method of making a plastic slide fastener which is not only simple and inexpensive in its fabrication and construction, but at the same time, efficient and effective in its use.

It is a further object of this invention to provide a new method of making a plastic slide fastener which is strong and rugged and one which can be conveniently attached to the stringer tape.

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 an enlarged schematic view showing diagrammatically the tools for making a fastening device in accordance with the present invention,

FIG. 2 is a sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary view of a slide fastener made from stringers according to the invention.

FIG. 4 is a plan view of a completed slide fastener showing a slider mounted thereon,

FIG. 5 is a sectional view taken on line 5—5 of FIG. 4;

FIG. 6 is a cross sectional view of another embodiment of my invention showing a collapsed or flattened elongated tubular member,

FIG. 7 is a cross sectional view of still another embodiment showing an elongated folded strip which may be

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used for making a fastening device in accordance with the present invention,

FIG. 8 is a fragmentary plan view of a fastening device made from the strip, as shown in FIG. 7, showing how it may be attached to a stringer tape, and

FIG. 9 is a sectional view taken on line 9—9 of FIG. 8.

Referring more particularly to the drawings, there is shown in FIG. 1, the various steps performed on an elongated or tubular member for forming a fastening device in accordance with the present invention. There is shown in this figure for the purpose of illustration, an elongated or continuous tubular member 2 substantially oval shape in cross section, but it will be understood that it may be an elongated member having a cross section such as shown in FIGS. 6 and 7 of the drawings and the same steps are performed thereon as a tubular member which will presently be described. In such an elongated or tubular member, there is provided opposed spaced-apart side walls 3 and edge or end walls 4 and 5 so as to provide a continuous circumferential wall. This elongated tubular member is preferably made from nylon, perlon or any other suitable plastic material, including rubber.

The first step in the practice of the present invention, as shown in FIGS. 1 and 2, is the cutting of transversely extending slots 6 and 7 in the edge or end wall portions 4 and 5 on either side of the tubular member 2. These slots extend from the outer edges 4 and 5 to a point intermediate the width of the tubular member and the slots on one side are staggered relative to the slots on the opposite side. These slots are cut preferably, as illustrated, by means of a pair of circular saws S with one arranged at each side of the tubular member but it will be understood that any other suitable means may be employed for cutting these slots.

The next step is to widen or expand these slots 6 and 7 on either side of the tubular so as to provide widened or expanded slots 6a and 7a, respectively. These slots may be widened or expanded by any suitable tools, such as wedge-like reciprocating tools W. As a result of this widening or expanding step it will be understood that there is provided head portions 8 on one side of the tubular member and attaching portions 9 on the opposite side thereof. Thus, it will be seen that as a result of this step the length of the tubular is extended or expanded, and that there is provided on one side thereof, a series of spaced-apart head portions 8 and on the opposite side a series of spaced-apart loop-like attaching portions 9 with both the head portions and attaching portions being successively interconnected by means of the diagonally disposed portion 12.

In the next step, in the practice of the present invention, the head portions 8 are deformed or upset preferably by means of a tool D in cooperation with an opposed wedge-like tool C so as to provide interlocking projections 13 on each of head portions on both the upper and lower sides thereof. It will be understood that these interlocking projections 13 are adapted to cooperate with and engage behind corresponding interlocking projections on the head portions of an opposed or companion fastening device so as to interlock the same in a manner well known to those skilled in the art.

After the tubular or elongated member has been formed as above described they may be attached to a stringer tape T or any other flexible carrier so as to provide a completed slide fastener stringer. In the embodiment just described the loop-like attaching portions 9 may be attached or stitched to the edge of a tape T by means of threads or stitching 14, as shown in FIGS. 3 and 5 of the drawings, or they may be stitched to the side thereof.

In FIG. 6 of the drawings there is shown a modification of the present invention, in which the elongated member from which the fastening device is formed from a col-

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lapsed tube 20 so as to provide a continuous circumferential wall having substantially flat superimposed side walls 21 and 22 and edge or end walls 23. Such an elongated member is formed into a fastening device in substantially the same manner as that described for the tubular member 2. Likewise, this type of fastening device may be attached to the edge of the tape in the same manner as that formed from the tubular member.

In FIGS. 7, 8 and 9 there is shown still another embodiment of the invention in which the elongated member is shown as a sheet or strip of material 24 folded upon itself so as to provide side walls 25 and 26 interconnected by an edge or end wall 27. In this construction the free edges may straddle the edge of the tape and sewn thereto, as shown in FIGS. 8 and 9, or they may be disposed in superimposed relation and sewn as at 23 or otherwise suitably attached to one side of the tape at the edge thereof.

It will be understood that after the stringers have been fabricated as previously described, two opposed stringers of the desired length are interlocked substantially as shown in FIG. 3, and a slider and top and bottom stops assembled thereon, if desired, so as to provide a complete slide fastener, in a well known manner, as shown in FIG. 4 of the drawings.

As a result of my invention, it will be seen that there is provided a new and improved plastic slide fastener stringer which may be inexpensively fabricated with the simplest of tools and at a minimum cost. It will also be seen that the interlocking means on the head portions provide an extremely strong interlock whereby a relatively strong fastener results.

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. The method of making a continuous fastening device of the type adapted to interlock with a continuous companion fastening device which comprises providing an elongated member having a pair of opposed wall portions interconnected at least along one edge thereof, forming a series of spaced-apart transversely extending slots in at least one side of said elongated member, each of said slots extending from the edge of said member to a point intermediate the width thereof, forcing a tool into each of said slots so as to widen and expand the same so as to provide a series of spaced-apart interlocking head portions, and finally deforming the material of each of said head portions adjacent the end thereof so as to provide an inter-locking portion on each of said head portions.

2. The method of making a stringer for slide fasteners of the class described which comprises providing an elongated member having a pair of opposed wall portions interconnected at least along one edge thereof, forming a series of spaced-apart transversely extending slots in at least one side of said elongated member, each of said slots extending from the edge of said elongated member to a point intermediate the width thereof, forcing a tool into each of said slots so as to widen and expand the same so as to provide a series of spaced-apart interlocking head portions, deforming the material of each of said head portions adjacent the end thereof so as to provide an interlocking portion on each of said head portions, and finally affixing the opposite edge portion of said elongated member to the edge of a stringer tape.

3. The method of making a continuous fastening device of the type adapted to interlock with a continuous companion fastening device which comprises providing an elongated member having a pair of opposed wall portions interconnected at least along one edge thereof, forming a series of spaced-apart transversely extending slots in the opposite sides of said elongated member, the slots

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on one side being staggered relative to those on the opposite side, each of said slots extending from the edge of said elongated member to a point intermediate the width thereof, forcing a tool into each of said slots on each side of said member so as to widen and expand the same so as to provide a series of spaced-apart interlocking head portions on one side of said elongated member and a series of similar spaced-apart attaching portions on the opposite side thereof, and finally deforming the material of each of said head portions adjacent the end thereof so as to provide an interlocking portion on each of said head portions.

4. The method of making a stringer for slide fasteners of the class described which comprises providing an elongated member having a pair of opposed wall portions interconnected at least along one edge thereof, forming a series of spaced-apart transversely extending slots in the opposite sides of said elongated member, the slots on one side being staggered relative to those on the opposite side, each of said slots extending from the edge of said elongated member to a point intermediate the width thereof, forcing a tool into each of said slots on each side of said member so as to widen and expand the same so as to provide a series of spaced-apart interlocking head portions on one side of said elongated member and a series of similar spaced-apart attaching portions on the opposite side thereof, deforming the material of each of said head portions adjacent the end thereof so as to provide an interlocking portion on each of said head portions, and finally affixing the attaching portions to the edge of a stringer tape.

5. The method of making a continuous fastening device of the type adapted to interlock with a continuous companion fastening device which comprises providing an elongated member having a continuous circumferential wall so as to provide a pair of opposed wall portions interconnected at each edge, forming a series of spaced-apart transversely extending slots in at least one side of said elongated member, each of said slots extending from the edge of said member to a point intermediate the width thereof, forcing a tool into each of said slots so as to widen and expand the same so as to provide a series of spaced-apart interlocking head portions, and finally deforming the material of each of said head portions adjacent the end thereof so as to provide an inter-locking portion on each of said head portions.

6. The method of making a stringer for slide fasteners of the class described which comprises providing an elongated member having a continuous circumferential wall so as to provide a pair of opposed wall portions interconnected at each edge, forming a series of spaced-apart transversely extending slots in at least one side of said elongated member, each of said slots extending from the edge of said member to a point intermediate the width thereof, forcing a tool into each of said slots so as to widen and expand the same so as to provide a series of spaced-apart interlocking head portions, deforming the material of each of said head portions adjacent the end thereof so as to provide an inter-locking portion on each of said head portions, and finally affixing the opposite edge portion of said elongated member to the edge of a stringer tape.

7. The method of making a continuous fastening device of the type adapted to interlock with a continuous companion fastening device which comprises providing an elongated member having a continuous circumferential wall so as to provide a pair of opposed wall portions interconnected at each edge, forming a series of spaced-apart transversely extending slots in the opposite sides of said elongated member, the slots on one side being staggered relative to those on the opposite side, each of said slots extending from the peripheral edge of said elongated member to a point intermediate the width thereof, forcing a tool into each of said slots on each side of said member so as to widen and expand the same so as to provide a

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series of spaced-apart interlocking head portions on one side of said tubular member and a series of similar spaced-apart attaching portions on the opposite side thereof, and finally deforming the material of each of said head portions adjacent the end thereof so as to provide an interlocking portion on each of said head portions.

8. The method of making a stringer for slide fasteners of the class described which comprises providing an elongated member having a continuous circumferential wall so as to provide a pair of opposed wall portions interconnected at each edge, forming a series of spaced-apart transversely extending slots in the opposite sides of said elongated member, the slots on one side being staggered relative to those on the opposite side, each of said slots extending from the edge of said elongated member to a point intermediate the width thereof, forcing a tool into each of said slots on each side of said elongated member so as to widen and expand the same so as to provide a series of spaced-apart interlocking head portions on one side of said elongated member and a series of similar spaced-apart attaching portions on the opposite side thereof, deforming the material of each of said head portions adjacent the end thereof so as to provide an interlocking portion on each of said head portions, and finally affixing the attaching portions to the edge of a stringer tape.

9. The method of making a continuous fastening device of the type adapted to interlock with a continuous companion fastening device which comprises providing a tubular member, forming a series of spaced-apart transversely extending slots in at least one side of said tubular member, each of said slots extending from the peripheral edge of said tubular member to a point intermediate the width thereof, forcing a tool into each of said slots so as to widen and expand the same so as to provide a series of spaced-apart interlocking head portions, and finally deforming the material of each of said head portions adjacent the end thereof so as to provide an interlocking portion on each of said head portions.

10. The method of making a continuous fastening device of a type adapted to interlock with a continuous companion fastening device which comprises providing a tubular member, forming a series of spaced-apart transversely extending slots in the opposite sides of said tubular member, the slots on one side being staggered relative to those on the opposite side, each of said slots extending from the peripheral edge of said tubular member to a point intermediate the width thereof, forcing a tool into each of said slots on each side of said tubular member so

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as to widen and expand the same so as to provide a series of spaced-apart interlocking head portions on one side of said tubular member and a series of similar spaced-apart attaching portions on the opposite side thereof, and finally deforming the material of each of said head portions adjacent the end thereof so as to provide an interlocking portion on each of said head portions.

11. The method of making a stringer for slide fasteners of the class described which comprises providing a tubular member, forming a series of spaced-apart transversely extending slots in at least one side of said tubular member, each of said slots extending from the peripheral edge of said tubular member to a point intermediate the width thereof, forcing a tool into each of said slots so as to widen and expand the same so as to provide a series of spaced-apart interlocking head portions, deforming the material of each of said head portions adjacent the end thereof so as to provide an interlocking portion on each of said head portions, and finally affixing the opposite edge portion of said tubular member to the edge of a stringer tape.

12. The method of making a stringer for slide fasteners of the class described which comprises providing a tubular member, forming a series of spaced-apart transversely extending slots in the opposite sides of said tubular member, the slots on one side being staggered relative to those on the opposite side, each of said slots extending from the peripheral edge of said tubular member to a point intermediate the width thereof, forcing a tool into each of said slots on each side of said tubular member so as to widen and expand the same so as to provide a series of spaced-apart interlocking head portions on one side of said tubular member and a series of similar spaced-apart attaching portions on the opposite side thereof, deforming the material of each of said head portions adjacent the end thereof so as to provide an interlocking portion on each of said head portions, and finally affixing the attaching portions to the edge of a stringer tape.

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