

Aug. 22, 1961

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2,996,797

METHOD OF MAKING A SEPARATING END CONNECTION

Filed Oct. 2, 1957

2 Sheets-Sheet 1

Fig. 1.

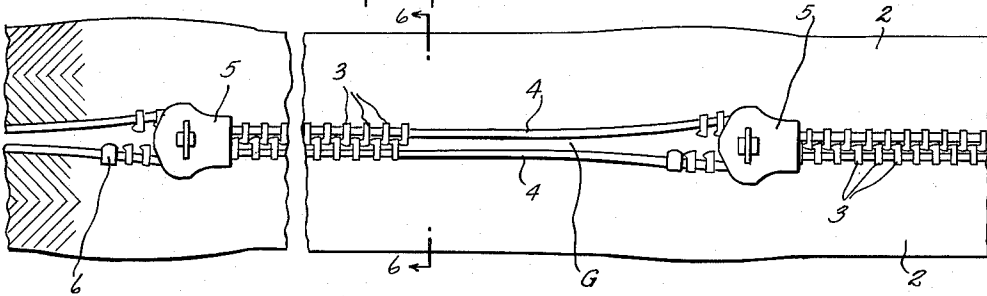


Fig. 2.

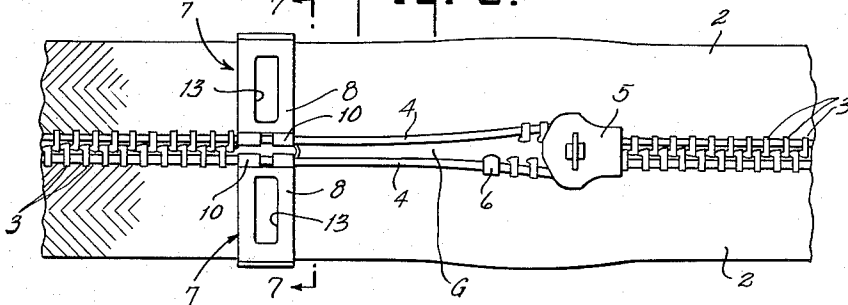


Fig. 3.

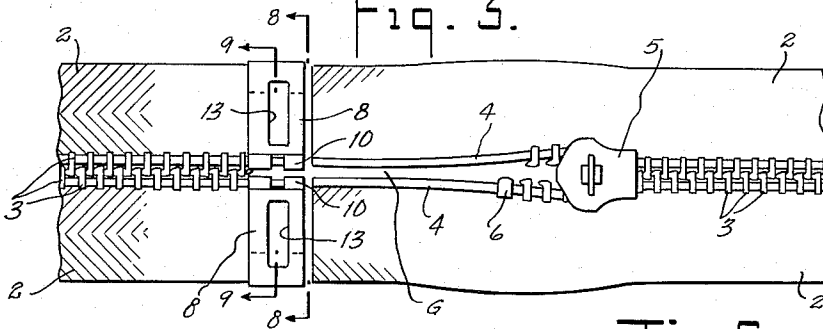


Fig. 4.

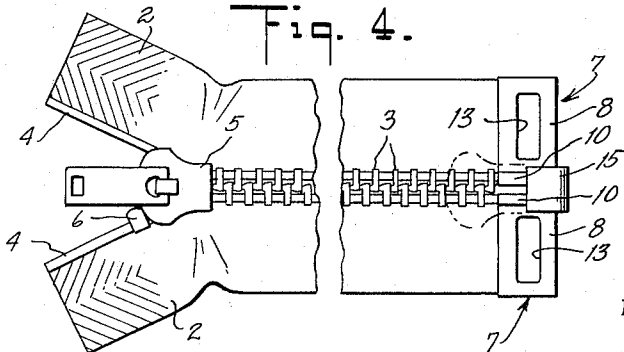
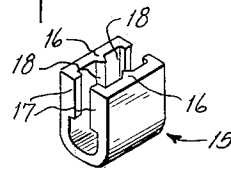


Fig. 5.



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2 Sheets-Sheet 2

Fig. 11.

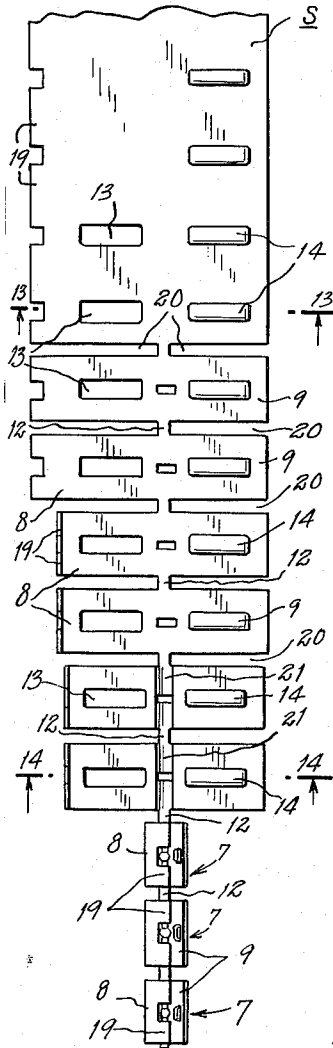


Fig. 12.

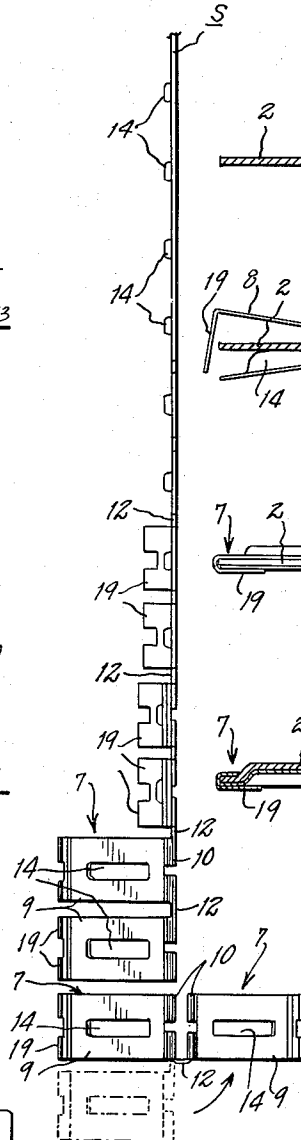


Fig. 6.



Fig. 7.

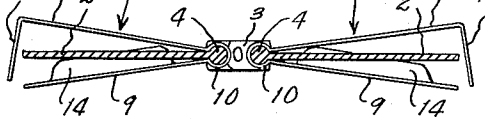


Fig. 8.

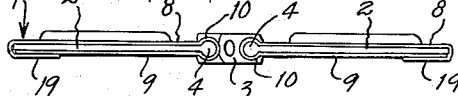


Fig. 9.

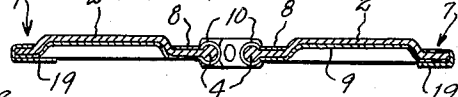


Fig. 13.

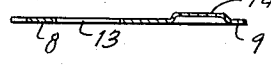


Fig. 14.

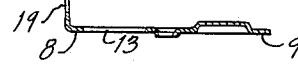


Fig. 15.

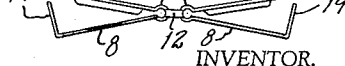
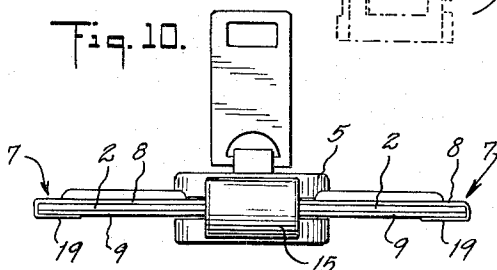


Fig. 10.



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1

2,996,797

METHOD OF MAKING A SEPARATING END CONNECTION

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6 Claims. (Cl. 29-408)

This invention relates to slide fasteners, and more particularly to an improved separating end connection therefor and method of making the same.

In the manufacture of slide fasteners, as is well known to those skilled in the art, it is the conventional practice to provide slide fastener chain which consists of a pair of stringer tapes having a series of spaced-apart interlocking fastener elements attached to their opposed beaded edges with the opposed elements of the respective stringers interengaged. The fastener elements are arranged in groups along the stringer tapes so as to provide a gap between each group and which is called "gap chain." Each group of fastener elements designates the length of fastener desired. After various operation on the "gap" chain, such as applying end stops and sliders thereto, the chain is cut apart at the "gap" space so as to provide individual fasteners.

Some types of slide fasteners are adapted to be completely separated when in use, i.e., the two stringers are completely separated from each other as in jackets and similar applications of fasteners of this type. It is to an improved separating end connection for this type of fastener and to a method of manufacturing the same and assembling it on the "gap" chain, that the present invention relates.

Accordingly, it is the general object of this invention to provide an improved separating end connection having reinforcing tape ends made of a relatively thin sheet of metallic material which can be conveniently and inexpensively fabricated and applied to the stringer tapes while in "gap" chain form and before the stringers are cut apart from one another.

It is another object of the invention to provide an improved method of making metallic reinforcing tape ends which can be secured to both stringer tapes simultaneously and which at the same time are positioned accurately around the beaded edges of the stringer tapes.

It is a more specific object of this invention to provide a pair of reinforcing tape ends which are integrally connected together until after they are securely attached to the stringer tapes whereby the tape ends can be efficiently and effectively attached to the stringer tapes so as to provide a strong and neat construction.

It is a further object of the present invention to provide an improved separating end connection which consists of a minimum number of parts and which is simple and inexpensive in its construction and, at the same time, efficient and effective in its use.

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 a plan view of a fragment of a length of slide fastener chain showing sliders assembled thereon,

FIG. 2 is a plan view of a fragment of slide fastener chain showing the first step in accordance with the present invention of attaching the reinforcing end members to the stringer tapes,

FIG. 3 is a plan view similar to FIG. 2, showing the

2

stringer tapes severed below the reinforcing end members, the second step in accordance with my method,

FIG. 4 is a plan view of a finished slide fastener showing the completed separating end connection assembled thereon,

FIG. 5 is a perspective view of the retainer member, FIG. 6 is a sectional view taken on line 6-6 of FIG. 1, FIG. 7 is a sectional view taken on line 7-7 of FIG. 2, FIG. 8 is a sectional view taken on line 8-8 of FIG. 3, FIG. 9 is a sectional view taken on line 9-9 of FIG. 3, FIG. 10 is a bottom end view of the finished fastener as shown in FIG. 4,

FIG. 11 is a plan view of a strip of flat metallic stock showing the steps in fabricating the reinforcing end connection of my invention therefrom,

FIG. 12 is a side view of the strip shown in FIG. 11, FIG. 13 is a sectional view taken on line 13-13 of FIG. 11,

FIG. 14 is a sectional view taken on line 14-14 of FIG. 11, and

FIG. 15 is an end view of a connected pair of reinforcing end members.

Referring more particularly to the drawings, there is shown in FIGS. 1 to 3, a length of so-called "gap" slide fastener chain which consists of a pair of continuous length stringer tapes 2 having a series of spaced-apart interlocking fastener elements 3 attached to the opposed beaded edges 4 thereof which are arranged in groups therealong so as to provide a gap space G between each group. On each group, there is arranged a slider 5 for longitudinal movement therealong, when the fastener is completed, for engaging and disengaging the fastener elements 3 in a well known manner. At the upper end of each of the groups of elements, there is attached to the beaded edge 4 of at least one of the stringer tapes adjacent the endmost fastener element thereof, a top stop 6 for limiting the movement of the slider in the closing direction.

The improved separating end connection of the present invention consists of a pair of identical reinforcing end members 7, preferably made of a relatively thin sheet of metallic material, which are disposed around the stringer tapes 2 in each of the gap spaces G adjacent the lower endmost fastener elements 3 of each group, as shown in FIG. 2. Each of the reinforcing end members 7 consist of a pair of spaced-apart similar substantially rectangular-shaped portions 8 and 9 which are adapted to be folded upon one another at a tube-like portion 10 arranged along one edge thereof. These reinforcing members 7 are initially formed in pairs, as more clearly shown in FIGS. 12 and 15 of the drawings, and connected at the lower end thereof by means of a relatively thin bridge-like portion 12 so as to space the opposed tube-like portions 10 accurately from one another. In the rectangular-shaped portion 8 of each end member, there is arranged an elongated transversely extending slot 13 and in the other rectangular-shaped portion 9, there is provided an elongated transversely extending embossed or raised portion 14 which has dimensions slightly smaller than the slot 13 with which it co-operates in a manner to be described. Along the other edge of the rectangular-shaped portion 8, there are arranged lateral extensions 19.

In assembling the connected pair of reinforcing end members on the stringer tapes 2 the tapes are first positioned between the opposed rectangular-shaped portions 8 and 9 of each of the end members with the beaded edges 4 snapped into position in the respective tube-like portions 10 of the respective end members, as shown in FIGS. 2 and 7, so that the end members are positioned in each of the gap spaces G immediately below the lower endmost fastener elements of the slide fastener chain.

3

The rectangular-shaped portions 8 and 9 of each of the end members are then forced together and the extensions 19 carried by the portion 8 bent over the outer edge of the opposed portion 9, as shown in FIGS. 3 and 8, so as to securely attach the end members to the respective tapes. In such position it will be seen that the tapes are securely clamped between the portions 8 and 9 and that the tape will be forced into and through the slots 13 of the portion 8 by the embossed portion 14 of the portion 9 so as to further aid in anchoring the end members to the stringer tapes.

Throughout this clamping operation of the end members to the tapes, it will be understood that the end members are still connected together by the bridge-like portion 10 as the lower end thereof which is now disposed between the opposed beaded edges 4 of the stringer tapes. This is an important feature in that it holds the end members in their proper position with respect to the tapes and the beaded edges thereof until they are securely attached thereto.

After the reinforcing end members have been secured to the tape stringers as above described, the bridge-like portion 12 is cut away and removed and preferably at the same time the stringer tapes 2 are severed transversely thereof immediately below the end members, in each of the gap spaces G, as shown in FIGS. 3 and 8, so as to provide a plurality of individual fastener lengths with each having a reinforcing end member arranged thereon at the lower end of the endmost fastener element of the respective stringers.

As shown in FIG. 5, there is provided a conventional box-like retainer member 15 having spaced-apart web walls 16 and spaced-apart marginal flange portions 17 so as to provide a slot 18 at either side thereof. This retainer member is positioned on the tube-like portion 10 of the end members so that the lower ends of the tube-like portions are housed therein, as shown in FIG. 4. The retainer member 15 is then securely attached to one of the tube-like portions 10 by a clamping action or by another suitable means with the tube-like portion 10 of the other reinforcing end member loosely and removably disposed therein, whereby the two stringers may be completely separated from one another in a manner well known to those skilled in the art.

Attention is now directed to FIGS. 11 through 15 of the drawings, which show the improved method of forming the reinforcing end members 7 and which will now be described. There is provided a relatively thin strip of sheet metal S along one side of which there is formed a series of spaced-apart, elongated, transversely extending slots 13 and along the other side a series of elongated, transversely extending, embossed portions 14. There is also formed along the marginal edge of the strip a plurality of spaced-apart extensions 14. The strip is then cut transversely, as at 20, so as to provide a series of reinforcing end members 7 connected centrally thereof by the bridge-like portions 12 and so as to provide the similar rectangular-shaped portions 8 and 9. In the next step the central portion of the strip between each of the rectangular-shaped portions 8 and 9 of each of the reinforcing end members 7 is arcuated or embossed, as at 21, so as to later provide the tube-like portions 10. The rectangular-shaped portions 8 and 9 are then bent toward one another at the arcuated or curved portions 21, as shown at the lower end of FIGS. 11 and 12, so that the portions 8 and 9 are spaced from one another and so as to provide the tube-like portions 10 along one edge thereof. This completes the fabrication of the individual end members which are still inter-connected by means of the bridge-like portion 12.

After the reinforcing end members 7 have been completely formed they are severed from the formed strip in pairs. That is to say, alternate bridge-like portions 12 are severed or removed so as to provide a pair of reinforcing end members connected by a bridge-like portion

4

12. The reinforcing members are then bent at the bridge-like portion 12 inter-connecting them so that one reinforcing member is disposed opposite the other and in the same place with the tube-like portions 10 of the respective members being spaced from one another and still connected by the bridge-like portion 12, as shown at the lower end of FIG. 12 of the drawings. This provides an assembly of a pair of reinforcing end members 7 which are attached to the stringer tapes 2 in the manner which has been hereinbefore described.

The box-like retainer member 15 is then positioned and assembled on the tube-like portions 10 of the reinforcing end members 7 in a manner which has been previously described so as to provide a finished separating slide fastener.

As a result of my invention, it will be seen that there is provided a separating end connection having an integral pin-tube-plate design which readily lends itself to the employ of a straight line method of assembly instead of the so-called "batch" method which requires numerous handlings and operations for individual fasteners and which are time consuming and involve several costly processing machines and equipment. Also, this method of snapping on the reinforcing tape ends insures complete coverage by the components of the cords at the beaded edge of the stringers, which is important and difficult to attain by other methods, especially on smaller size fasteners. It will readily be seen that when the plates are compressed around the tape, the cords are compressed for secure anchorage, which is further aided by the unique tape lock.

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.

What I claim as my invention is:

1. In the manufacture of slide fasteners of the class described, the method of forming and finishing tape ends of separating fastener stringers which comprises providing a continuous length of slide fastener chain consisting of a pair of stringer tapes having a series of spaced-apart interlocking and interengaged fastener elements attached to the opposed edges thereof, said fastener elements being arranged in groups along said stringer tapes so as to provide gap spaces therebetween, providing a pair of thin metallic reinforcing tape ends integrally connected together by a thin bridge-like portion, folding each one of said pair of tape ends around each of the opposed edges of each of the stringer tapes in each of the gap spaces adjacent the endmost fastener elements of each of said groups so as to be securely attached to the respective stringer tapes, severing said bridge-like portion and both of the stringer tapes transversely thereof at a point immediately below each of said tape ends so as to provide a plurality of individual fastener lengths, and finally securely attaching a retainer member to one of said tape ends of each of said lengths at the bottom inner edge thereof.

2. In the manufacture of slide fasteners of the class described, the method of forming and finishing tape ends of separating fastener stringers which comprises providing a continuous length of slide fastener chain consisting of a pair of stringer tapes having a series of spaced-apart interlocking and interengaged fastener elements attached to the opposed edges thereof, said fastener elements being arranged in groups along said stringer tapes so as to provide gap spaces therebetween, providing a pair of identical reinforcing tape ends one for each of said stringer tapes connected together at one end by a thin bridge-like portion and made from thin sheet metallic material, each of said tape ends consisting of two similar rectangular-shaped portions folded one upon the other, folding the two portions one upon the other around each of the stringer tapes

in each of the gap spaces adjacent the endmost fastener elements of each of said groups so as to be securely attached to the respective stringer tapes, severing the bridge-like portion and both of the stringer tapes transversely thereof at a point immediately below each of said tape ends so as to provide a plurality of individual fastener lengths, and finally securely attaching a retainer member to one of said tape ends of each of said lengths at the bottom inner edge thereof.

3. In the manufacture of slide fasteners of the class described, the method of forming and finishing tape ends of separating fastener stringers which comprises providing a continuous length of slide fastener chain consisting of a pair of stringer tapes having a series of spaced-apart interlocking and interengaged fastener elements attached to the opposed edges thereof, said fastener elements being arranged in groups along said stringer tapes so as to provide gap spaces therebetween, providing a reinforcing tape end for each of said stringer tapes, each of said reinforcing tape ends being identical and being made of a relatively thin sheet of metallic material and connected together at one end by a thin bridge-like portion, each of said tape ends consisting of two substantially rectangular-shaped portions folded one upon the other along the inner edge thereof, one of said rectangular-shaped portions having an elongated transversely extending slot arranged therein, the other of said rectangular-shaped portions having an elongated transversely extending embossed portion struck up from the material thereof corresponding in shape with said slot with which it co-operates, positioning the connected pair of tape ends around each of said stringer tapes in each of the gap spaces adjacent the endmost fastener elements of each of said groups whereby the embossed portion of one of the rectangular-shaped portions of each pair forces the stringer tape into and through the elongated slot in the opposed respective rectangular-shaped portion of each pair so as to securely anchor the tape ends to the respective stringer tapes, severing the bridge-like portion and both of the stringer tapes transversely thereof at a point immediately below each of said tape ends so as to provide a plurality of individual fastener lengths, and finally securely attaching a retainer member to one of said tape ends of each of said lengths at the bottom inner edge thereof.

4. In the manufacture of reinforcing tape ends for slide fasteners of the completely separating type, the method which comprises providing a relatively thin strip of metallic material, slotting the strip transversely at spaced intervals along both sides thereof so that the slots extend inwardly from each of the marginal edges of the strip to a point intermediate the width thereof whereby a series of pairs of substantially rectangular-shaped portions are provided with each pair connected to the next adjacent pair by a narrow bridge-like portion centrally of the strip, bending the rectangular-shaped portions toward one another between the bridge-like portions so as to provide a series of tape ends successively connected to one another by the bridge-like portions, severing pairs of connected tape ends from the formed strip at alternate bridge-like portions so as to provide a pair of tape ends connected by a bridge-like portion, and finally bending each pair of connected tape ends at the bridge portion relative to one another so that both tape ends lie in substantially the same plane and in side-by-side relation with the opposed inner edges of the tape ends spaced from one another in parallelism.

5. In the manufacture of reinforcing tape ends for slide

fasteners of the completely separating type, the method which comprises providing a relatively thin strip of metallic material, slotting the strip transversely at spaced intervals along both sides thereof so that the slots extend inwardly from each of the marginal edges of the strip to a point intermediate the width thereof whereby a series of pairs of substantially rectangular-shaped portions are provided with each pair connected to the next adjacent pair by a narrow bridge-like portion centrally of the strip, arcuating the central portion of each of said pair of rectangular-shaped portions longitudinally thereof between said interconnecting bridge-like portions, bending the rectangular-shaped portions toward one another at the respective arcuated portions so as to provide a series of tape ends successively connected to one another by the bridge-like portions and so as to form the arcuated portion therebetween into substantially a tube-like portion, severing pairs of connected tape ends from the formed strip at alternate bridge-like portions so as to provide a pair of tape ends connected by a bridge-like portion, and finally bending each pair of connected tape ends at the bridge portion relative to one another so that both tape ends lie in substantially the same plane and in side-by-side relation with the opposed tube-like portions of the tape ends spaced from one another in parallelism.

6. In the manufacture of reinforcing tape ends for slide fasteners of the completely separating type, the method which comprises providing a relatively thin strip of metallic material, slotting the strip transversely at spaced intervals along both sides thereof so that the slots extend inwardly from each of the marginal edges of the strip to a point intermediate the width thereof whereby a series of pairs of substantially rectangular-shaped portions are provided with each pair connected to the next adjacent pair by a narrow bridge-like portion centrally of the strip, forming a transversely extending slot in each of the rectangular-shaped portions to one side of the center thereof, forming a transversely extending embossed portion in each of the rectangular-shaped portions to the other side of the center thereof directly opposite said last mentioned slots, arcuating the central portion of each of said pair of rectangular-shaped portions longitudinally thereof between said interconnecting bridge-like portions, bending the rectangular-shaped portions toward one another at the respective arcuated portions so as to provide a series of tape ends successively connected to one another by the bridge-like portions and so as to form the arcuated portion therebetween into substantially a tube-like portion, severing pairs of connected tape ends from the formed strip at alternate bridge-like portions so as to provide a pair of tape ends connected by a bridge-like portion, and finally bending each pair of connected tape ends at the bridge portion relative to one another so that both tape ends lie in substantially the same plane and in side-by-side relation with the opposed tube-like portions of the tape ends spaced from one another in parallelism.

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