March 31, 1959 L. H. MORIN 2,879,588

METHOD OF AND APPARATUS FOR ASSEMBLING SLIDERS WITH SEPARABLE FASTENER STRINGERS

Filed June 24, 1952 3 Sheets-Sheet 1

Fig. 1.

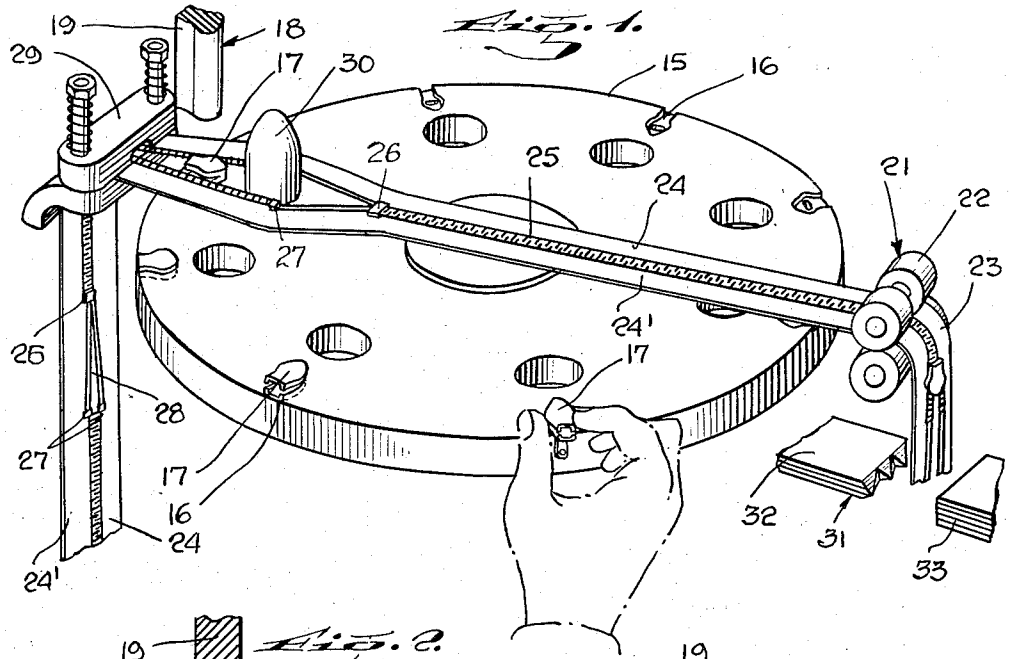


Fig. 2.

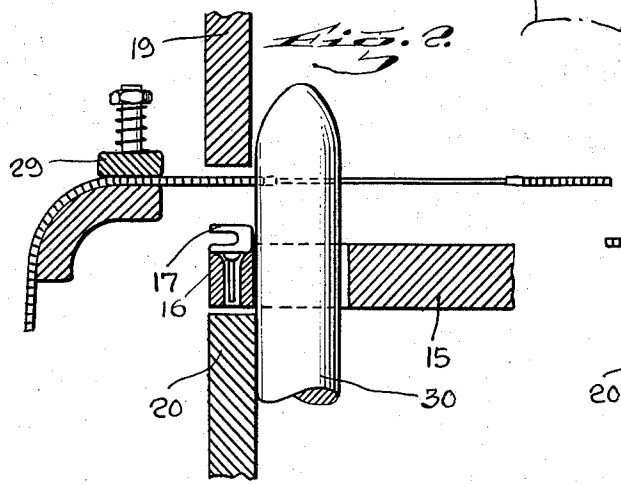


Fig. 3.

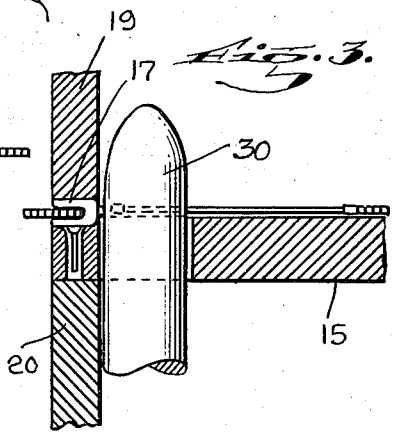


Fig. 4.

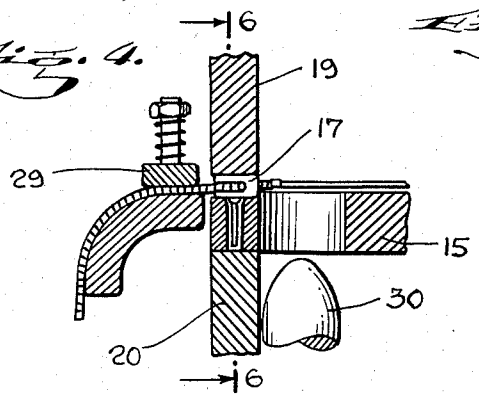
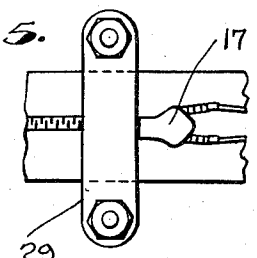


Fig. 5.



INVENTOR
LOUIS H. MORIN
BY
Howard Thompson
ATTORNEY

March 31, 1959 L. H. MORIN 2,879,588

METHOD OF AND APPARATUS FOR ASSEMBLING SLIDERS WITH SEPARABLE FASTENER STRINGERS

Filed June 24, 1952 3 Sheets-Sheet 2

Fig. 6.

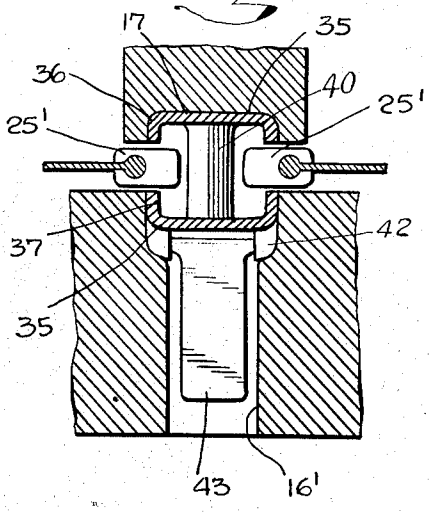


Fig. 7.

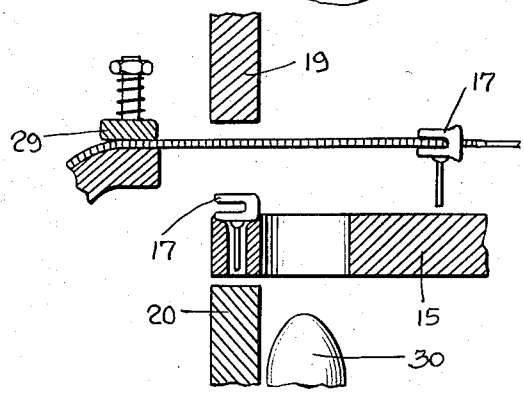


Fig. 8.

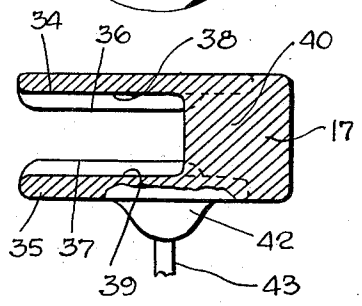
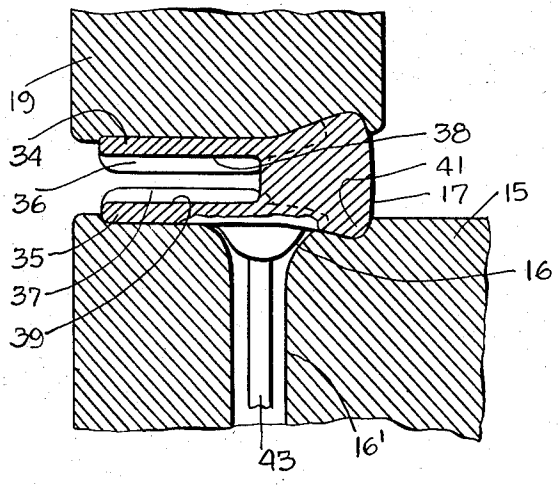


Fig. 9.



INVENTOR
LOUIS H. MORIN

BY
Howard P. Thompson
ATTORNEY

March 31, 1959 L. H. MORIN 2,879,588

METHOD OF AND APPARATUS FOR ASSEMBLING SLIDERS WITH SEPARABLE FASTENER STRINGERS

Filed June 24, 1952 3 Sheets-Sheet 3

Fig. 10.

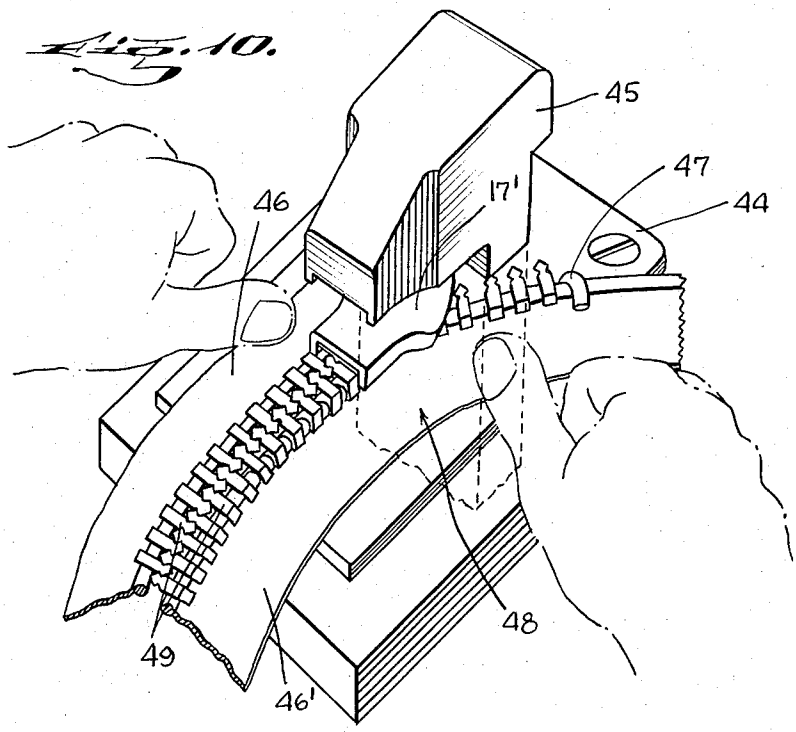
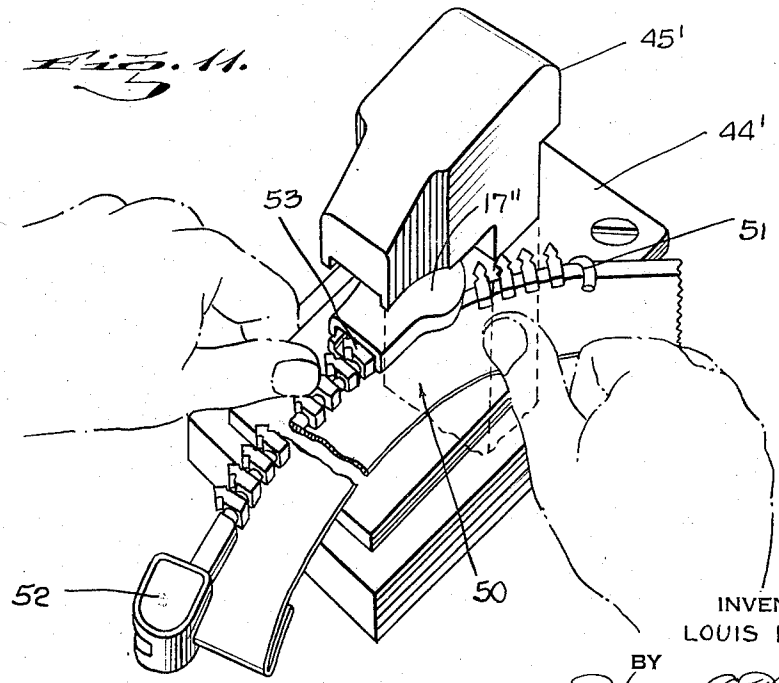


Fig. 11.



INVENTOR
LOUIS H. MORIN
BY
Howard E. Thompson
ATTORNEY

United States Patent Office 2,879,588 Patented Mar. 31, 1959

2,879,588

METHOD OF AND APPARATUS FOR ASSEMBLING SLIDERS WITH SEPARABLE FASTENER STRINGERS

Louis H. Morin, Bronx, N.Y.

Application June 24, 1952, Serial No. 295,244

10 Claims. (Cl. 29—408)

This invention relates to the production of separable fasteners employing stringers with a slider operating along the stringers to couple and uncouple the same. More particularly, the invention deals with what I term a continuous slider assembly, wherein sliders can automatically be attached to a pair of stringers, to which end stops have been attached so as to produce completely assembled separable fastener stringers. Still more particularly, this method can be utilized in a continuous production run wherein scoops and end stops are attached to long stringer tapes and sliders assembled to each stringer length of the tapes and, then, later the tapes severed to form the predetermined separable fasteners.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed and, in which the separate parts are designated by suitable reference characters in each of the views and in which:

Fig. 1 is a diagrammatic view illustrating one adaptation of my invention.

Fig. 2 is an enlarged sectional view through part of the apparatus diagrammatically seen in Fig. 1.

Fig. 3 is a view similar to Fig. 2 showing a different position.

Fig. 4 is a view similar to Figs. 2 and 3 with the parts in another position.

Fig. 5 is a plan view of the structure as seen in Fig. 4, omitting part of the construction.

Fig. 6 is an enlarged section on the line 6—6 of Fig. 4.

Fig. 7 is a view similar to Fig. 1, showing the parts in a different position.

Fig. 8 is a sectional view through a slider blank.

Fig. 9 is a sectional view through the blank, indicating compression of the blank to the fitting size on the stringers.

Fig. 10 is a perspective view diagrammatically illustrating another method of assembling sliders to the pairs of stringer tapes; and

Fig. 11 is a view similar to Fig. 1 showing another adaptation of my invention.

In practice, it has been customary in the production of separable fasteners to first produce the stringer tapes, then to join a pair of stringer tapes, either with a slider to be used, or with a tool slider, then to attach the bottom stops, after which the slider is attached to the stringers and, finally, the top stops are applied. These several operations require considerable handling and added equipment by way of machine for accomplishing the several results.

The purpose of my present invention is to materially simplify the production of separable fasteners by attaching sliders onto the stringers, after end stops have been attached to the stringer tapes, so that separable fasteners can be produced continuously from the point of attachment of the scoops to the stringer tapes, the invention comprising joining the tapes, attaching the end stops thereto, applying the slider to each separable fastener

unit of the joined tapes, and then finally cutting the tapes to form individual separable fastener lengths.

In Fig. 1 of the drawing, I have illustrated one adaptation of my invention and, in said figure, 15 represents a dial or indexing table suitably rotatably mounted and having, at its peripheral edge, sockets 16 for the reception of slider blanks 17, the blanks being inserted into the sockets 16 by hand or in any other desired manner. The table 15 is intermittently rotated in timed relation to the operation of the machine to bring the sockets 16 with the blanks 17 therein in spaced relation to a slider forming station 18, at which station is arranged a punch 19 and anvil support 20, the latter serving to back up the table 15 in the operation of compressing the slider blank 17, as later described.

At 21 is diagrammatically illustrated a feed station comprising pairs of feed rollers 22 and 23 intermittently actuated to feed the stringer tapes 24, 24' to bring successive fastener units 25 thereof into registering position with the station 18. It will be noted, at the left of Fig. 1 of the drawing, that the tapes 24, 24' are delivered to the station 18 in assembled form and with bottom stops 26 and top stops 27 attached to the ends of each fastener unit 25, thus leaving between the units 25 the free tape spacings 28 which form the tape ends, as usually employed on separable fasteners for attachment to supports.

Adjacent the station 18 is a spring tensioned clamp unit 29 for applying slight tension to the tapes 24, 24' to maintain the same in position in the operation of attaching the slider to the stringers, the clamp being movable toward the station 18 at the time of attaching the slider to the stringers, as later described. Also arranged adjacent the station 18 and at an opposite side with respect to the clamp 29 is a tapered separator finger 30, the finger 30 being movable vertically or longitudinally with respect to the punch 19 and serves to spread the tapes 24, 24' for entrance of the slider blank 17 between the spread tapes, as diagrammatically seen in Fig. 1, preparatory to assembling the slider on the tapes.

Beyond the feed station 21, I provide a trimming station 31 comprising a severing or trimming knife 32 and anvil 33 for severing the tapes 24, 24' substantially centrally of the blank space 28 in forming the final separable fastener units 25.

In delivery of the stringer tapes 24, 24' to the station 18, these tapes will be delivered after the scoops thereof have been plated or coated with any desired materials and it is important to point out that, with my method of attaching the sliders to the stringers, no injury takes place to the plating or coating as a definite control is provided to limit the degree of compression, so that opposed walls 34 and 35 of the slider blank 17, note Fig. 8, are brought together into closer and parallel relationship to each other, as noted in Fig. 9 of the drawing, but to such a degree as to not engage upper and lower surfaces of the scoops of the stringer tapes 24, 24'. The degree of this compression will be definitely controlled, it being understood that sufficient clearance is provided between the downturned flanges 36, 37 of the walls 34, 35 to provide free passage of the fastener scoops 25' through the space between said flanges in the slider blank 17. Note, in this connection, Fig. 6 of the drawing.

Then the walls 34 and 35 are compressed, as seen for example in Fig. 9, to have these flanges overlie the outer edges of the scoops 25' and with the inner surfaces 38 and 39 of the walls 34 and 35 spaced with respect to upper and lower or outer opposed surfaces of the stringer scoops.

It will be noted from a comparison of Figs. 8 and 9 of the drawing that the connecting web 40 of the slider blank 17 is reshaped at its outer end or at the thicker wall portion, as noted at 41 in Fig. 9 and these operations can

be performed on a cast slider blank with a degree of compression up to 40% or 50% without any danger of destruction or breakdown of the material employed. It will also be apparent from a consideration of Figs. 8 and 9 that the slider blank includes a pull pivot portion 42, to which a pull 43 has been previously attached, the table 15 or the socket 16 thereof being apertured as seen at 16' to receive the pull 43, as noted in Fig. 9 of the drawing.

Considering now Figs. 2, 3, 4, 5 and 7 in conjunction with Figs. 1 and 6, the successive steps in the operation of attaching the slider will be understood when taken in connection with the following statement.

In Fig. 2, the finger 30 has been shown raised to spread the stringers 24 and 24' and this result is accomplished with the table 15 in a lowered position, the table having been rotated to bring one of the blanks 17 beneath the punch 19. The table is then raised to bring the slider into position between the spread stringers and the scoops 25' thereon, as noted in Fig. 1, after which, the anvil 20 has been raised onto the lower surface of the table 15 and the punch 19 is moved down into contact engagement with the slider blank 17 to definitely position the blank on the table, after which the finger 30 is lowered, as noted in Fig. 4; the stringer tapes 24, 24' are then drawn by the rollers 22, 23 to move the scoops 25' of the stringers into the channel of the slider blank as partly noted in Fig. 6 of the drawing and more completely shown in Fig. 5, after which the punch 19 is depressed to compress the slider from the position shown in Fig. 8 to that illustrated in Fig. 9, thus assembling the slider on the scoops of one of the fastener units 25 intermediate the stop end portions thereof defined by the stops 26 and 27.

In the above operation, it will be noted that the tension clamp 29 has been moved into close proximity to the punch 19 so as to support the engaged scoops in close proximity to the narrow end of the slider body.

Upon completing the above operation, the parts are then moved into the position substantially as diagrammatically shown in Fig. 7, the rollers 22 and 23 feed the tape to quickly bring another fastener length into position above the finger 30 and, at the same time, the table 15 is rotated to bring another slider blank into position beneath the punch 19, whereupon, the finger is again raised to the position shown in Fig. 2 and the above operation is repeated.

In Fig. 10 of the drawing, I have shown another method of procedure, wherein a stationary anvil 44 is provided which is recessed to receive a slider blank 17', similar to the blank 17, and at 45 is shown a punch, actuated by suitable means vertically through the bedplate of the anvil in compressing the slider blank in the manner specifically described above.

In Fig. 10, two stringers 26, 26' are shown generally similar to the stringers 24, 24' and to which the end stops are attached, one of the top stops being indicated at 47 and here the stringers or each fastener unit 48 of the stringers will have the scoops 49 of the stringers uncoupled so as to spread the stringers for passage laterally between the flanges of the slider 17' in the manner described above, after which, the stringers will be moved to a position, such as shown in Fig. 10, to bring the coupled scoops in alinement with the contracted end of the slider. Thereafter, the punch 45 will be depressed by any suitable means to compress the slider in attaching the same to the fastener unit 48. In other words, in Fig. 10 of the drawing, I have diagrammatically shown an adaptation, wherein the table 15 is dispensed with, as is also the clamp 29, feed rollers 22 and 23 and finger 30, it being understood that, as each fastener unit is brought to the slider attaching station defined by the anvil 44 and punch 45, the stringers will be separated by hand sufficiently to position the same on the slider blank and the stringers will be fed by hand intermittently to bring successive fastener units 48 into position for assemblage.

In Fig. 11, I have shown a slight modification of the

structure shown in Fig. 10, wherein 44' is the anvil; 45' the punch; and 17'' is the slider blank. In Fig. 11, I have shown a method, wherein the slider is attached to what is generally identified as come-apart or separable slide fasteners, that is to say, to a stringer 50 for such a fastener having a top stop 51 at one end and a box part coupling 52 at the other end. In fasteners of this type and kind, the slider is attached permanently to one stringer, namely, that having the box part, and the other stringer is detachably coupled therewith through the box part in manners well known in this art.

With this construction, it will be apparent that the single stringer is simply threaded into the slider blank 17'', after which the punch 45' is actuated to compress the slide blank on the stringer. By applying the slider in this way to the stringer 50 much time can be saved over the conventional method of applying a slider by threading the stringer through it, particularly in the case of long stringers.

In general, not only does the present invention speed up the assembly or application of sliders to stringers, but also it eliminates the need for skilled operators for applying the sliders. It provides an improved sequence of manufacturing steps, beginning with continuous lengths of stringer tapes, which are formed in any suitable or desired manner into a continuous length of coupled stringers. This continuous length of coupled stringers, or zipper chain, as will be understood, comprises successive spaced groups of interlocked scoops, each such group being designated a unit or section. Top stops may be applied to the stringer of each section in a suitable way, for example by the means described in copending application Ser. No. 133,513, filed on December 17, 1949. Following the application of top stops, the continuous zipper chain is passed to a bottom stop applying station where a bottom stop is placed at the bottom of each section, for example by following the teachings of U.S. Patent 2,543,418. If desired, the bottom stops may be attached prior to the top stops. The zipper chain may then be coated, as by enameling the scoops and stops or by electroplating them. The enameling may be carried out in a conventional way by passing the chain between a series of pairs of rolls which apply the enamel, dry it, bake it, etc.; the electroplating may conveniently be performed according to the teachings of U.S. Patent 2,326,707. It will be understood that where a coating is not required, this step may be omitted. The zipper chain is then moved to the slider-applying station as illustrated in Figs. 1 or 10 where a slider is applied to each section in the manner described above.

The slider blank used in the latter step is preferably die cast, it having been found that the web portion of such a slider is deformable and non-resilient, such that after compression there is no "give," i.e., the slider walls do not tend to spring back to their original position. Also, during compression the walls may be maintained parallel to each other. Preferably the web is compressed an amount equivalent to a reduction in the height of the web of 30 to 40%, a 36% reduction being particularly desirable. It may also be seen that in some cases the degree or amount of compression is to a certain extent within the choice of the operator, that is to say, he may apply a slider to stringers of varying scoop widths. In the case of die cast scoops, an additional advantage is apparent because as the dies wear or are lapped to present a new parting line and the scoops produced from them thus decrease in thickness, the operator can still keep constant the distance between the inner surface of a slider wall and the adjacent opposed surfaces of the scoops inside the slider channels. As has been noted, the slider blank may be enameled or electroplated prior to its application to the stringers because the step of compressing it does not injure the enamel or the plate. The blanks are, of course, so constructed that the flanged walls are spaced apart a distance greater than the scoop width of the stringers to

which they are to be applied, this distance being measured between opposed edges of opposed flanges. The blank otherwise has conventional lateral openings and scoop channels, and it has a double channel end and a single channel end.

Coincident with the compression step is the flaring of the entrance of each channel of the slider adjacent the web, as shown in Fig. 9. A flared entrance like this provides for easier joining of the stringers. As will be understood, the flaring of the channel entrances may be omitted and a slider produced in which the walls are parallel to each other throughout.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The method of attaching a slider to a stringer having end stops at end portions thereof, which comprises supporting a channelled slider blank at an assembly station, placing the scoops of a stringer through the side of the blank for positioning within a channel portion of the slider blank, and then compressing the slider blank to form a slider enveloping the scoops within a channel thereof.

2. The method of attaching a slider to coupled stringers having end stops at end portions of the stringers, which comprises separating the coupled stringers adjacent one end thereof and spreading the stringers apart, then positioning a slider blank between the spread stringers, then moving the scoops of the stringers through the sides of the slider blank and within channels of the slider blank, then positioning the scoops so as to dispose coupled scoops at the contracted end of the slider blank, and then compressing the slider blank to form a slider enveloping the scoops of the stringers therein at a position inwardly of said end of the stringers.

3. The method of continuously producing individual lengths of separable fasteners, each length comprising a pair of coupled stringer tapes having top and bottom stops and a slider assembled therewith, which comprises forming a continuous length of coupled stringers from a pair of continuous stringer tapes, each said continuous stringer tape having successive spaced groups of scoops mounted thereon, a pair of opposed groups of scoops of said tapes being interlocked to form a section of coupled stringers, applying a bottom stop to each section, continuously coating the scoops and stops of each section, then advancing each section to a slider-applying station, separating the stringers of each section adjacent the top stop end thereof, positioning a coated slider blank between said separated stringers to aline the latter with lateral openings of the slider blank, moving the separated stringers toward each other to enter each said stringer laterally through one of said openings and into a channel to the slider blank, deforming the web portion of said blank by compressing the same to move the slider walls towards each other while maintaining them parallel and while maintaining the coating of the blank intact, thereby forming a slider in operative position on each said section, coincidently with said compressing step forming a flared entrance in each channel of the slider adjacent the web, and severing each slider-containing section from the remainder of said sections to produce individual separable fastener lengths.

4. The method of continuously producing individual lengths of separable fasteners, each length comprising a pair of coupled stringer tapes having top and bottom stops and a slider assembled therewith, which comprises forming a continuous length of coupled stringers from a pair of continuous stringer tapes, each said continuous stringer tape having successive spaced groups of scoops mounted thereon, a pair of opposed groups of scoops of said tapes being interlocked to form a section, applying top stops to each section of said continuous length of coupled stringers, applying a bottom stop to each said section, then advancing each section to a slider-applying station, separating the stringers of each section adjacent

to the top stop end thereof, positioning a slider blank between said separated stringers to aline the latter with lateral openings of the slider blank, moving the separated stringers towards each other to enter each said stringer laterally through one of said openings and into a channel of the slider blank, deforming the web portion of said blank by compressing the same to move the slider walls towards each other while maintaining them parallel, thereby forming a slider in operative position on each said section, and severing each slider-containing section from the remainder of said sections to produce individual separable fastener lengths.

5. The method of continuously producing individual lengths of separable fasteners, each length comprising a pair of coupled stringer tapes having a slider assembled therewith, which comprises: forming a continuous length of coupled stringers comprising successive spaced groups of interlocked scoops mounted on continuous stringer tapes, each said group of interlocked scoops forming a section, separating the stringers of each section throughout a limited distance adjacent one end portion of a section, positioning a slider blank between said separated stringers to aline each of the latter with a lateral opening in the slide blank, said slider blank having a pair of web-connected flanged walls that are spaced apart a distance greater than the scoop width of the stringers, said distance being measured between opposed edges of opposed flanges, moving said separated stringers of said section towards each other to enter each said stringer laterally through an opening and into a channel of the slider blank, then moving said stringers longitudinally through the slider blank channels a distance sufficient to bring a coupled portion thereof within the blank at the narrow end portion of the blank, deforming the web portion of said blank by compressing the same to move the slider walls towards each other while maintaining them parallel, thereby forming a slider in operative position on said section, and coincidently with said compressing step forming a flared entrance in each channel of the slider adjacent the web.

6. The method of applying a slider to a separable fastener comprising a pair of coupled stringers which comprises: separating the stringers throughout a limited distance adjacent one end portion of the same, positioning a slider blank between said separated stringers to aline each stringer with a lateral opening in the slider blank, said slider blank having a pair of web-connected flanged walls that are spaced apart a distance greater than the scoop width of the stringers, said distance being measured between opposed edges of opposed flanges, moving the separated stringers towards each other to enter each said stringer laterally through an opening and into a channel of the slider blank, then moving the stringers longitudinally through the slider blank channels a distance sufficient to bring a coupled portion of the stringers within the blank at the narrow end portion of the blank, reshaping the web portion of said blank by compressing the same to move the slider walls towards each other while maintaining them parallel, thereby forming a slider in operative position on said fastener.

7. The method of applying a slider to a separable fastener stringer comprising entering the stringer through a lateral opening of the slider blank and into a channel thereof, said slider blank having a pair of web-connected flanged walls that are spaced apart a distance greater than the scoop width of the stringer, said distance being measured between opposed edges of opposed flanges, reshaping the web portion of said blank by compressing the same to move the slider walls towards each other while maintaining them parallel, thereby forming a slider in operative position on said stringer.

8. The method of attaching sliders to spaced coupled stringer sections having end stops at the ends of the scoops of each section and blank tape portions intermediate adjacent scoop sections, which consists in intermittently

feeding the sections to bring a coupled section into registering position with a slider applying station, spreading one end portion of said coupled section at said station, then positioning a slider blank between spread portions of the section, then moving the spread portions of the section to dispose the scoops thereof within channel portions of the slider blank, then compressing the slider blank to form a slider enveloping the scoops in the channels thereof, and then feeding the sections to bring the next successive coupled section into position to receive a slider.

9. Apparatus for applying sliders to separable fastener stringers in the form of a continuous length of coupled stringers comprising successive spaced groups of interlocked scoops mounted on continuous stringer tapes, each said group of interlocked scoops forming a section: comprising a movable slider blank-supporting station, means for intermittently feeding said continuous length of coupled stringers to said station, means adjacent said station for supporting at least an end portion of a section of said continuous length under tension relatively to said station, a movable separator for separating the stringers at said end portion of the section, means for moving said station to position a slider blank thereon between said separated stringers, means for removing the separator to permit the separated stringers to move towards each other and to enter lateral openings in the slider blank, a punch normally spaced from said station and movable to and from said station for compressing the web portion of the blank and thus to move the walls of the blank towards each other, thereby applying a slider to said section, and means for freeing the slider from said station preparatory to feeding the section therefrom.

10. Apparatus for applying sliders to separable fastener stringers in the form of a continous length comprising successive spaced groups of interlocked scoops mounted on continuous stringer tapes, each said group of interlocked scoops forming a section of joined stringers, comprising: a movable slider blank-supporting station, means on one side of the station for supporting at least a portion of one of said sections relatively to the station, a separator on the other side of the station movable in one direction to separate the stringers at one end portion of said section, means for moving the station to position a slider blank thereon between said separated stringers, said separator being movable in the opposite direction to permit the separated stringers to move towards each other and the scoops thereon to enter lateral openings in the slider blank, means normally spaced from the station and movable to and from the same for compressing the web portion of the blank and thus to move the walls of the blank towards each other, thereby applying a slider to said section, means beyond the separator for drawing said section away from the station and introducing a succeeding section thereto, and means adjacent said drawing means for cutting off from said continuous length each section with its applied slider.

References Cited in the file of this patent

UNITED STATES PATENTS

2,219,165	Nedal	Oct. 22, 1940
2,245,335	Frey	June 10, 1941
2,287,263	Nedal	June 23, 1942
2,312,045	Morin	Feb. 23, 1943
2,397,037	Norkin	Mar. 19, 1946
2,474,908	Morin	July 5, 1949
2,640,255	Morrow	June 2, 1953

UNITED STATES PATENT OFFICE

Certificate of Correction

Patent No. 2,879,588 March 31, 1959

Louis H. Morin

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 53, for "26, 26'" read —46, 46'—; column 4, line 15, for "slide blank" read —slider blank—; column 5, line 43, after "section" insert —, applying top stops to each section of said continuous length—.

Signed and sealed this 21st day of July 1959.

[SEAL]

Attest:
KARL H. AXLINE,
Attesting Officer.

ROBERT C. WATSON,
Commissioner of Patents.