

[54] END STOP MEMBER FOR SLIDING CLASP  
FASTENERS

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[75] Inventor: Hiroyuki Ebata, Uozu, Japan

[73] Assignee: Yoshida Kogyo Kabushiki Kaisha,  
Tokyo, Japan

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Primary Examiner—Roy D. Frazier  
Assistant Examiner—Darrell Marquette  
Attorney, Agent, or Firm—Frank J. Jordan

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[51] Int. Cl.<sup>2</sup>..... A44B 19/36

[58] Field of Search..... 24/205.11 F

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UNITED STATES PATENTS

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[57] ABSTRACT

A sliding clasp fastener is provided at the bottom end thereof with an end stop for terminating the movement of a slider thereat. The end stop includes side foil members of reduced thickness adhesively bonded to opposed stringer tapes of the fastener, each foil member projecting longitudinally of the fastener for a distance corresponding to a pitch or pitches of fastener elements thereby holding these elements against cracking open when the slider has been brought into abutting engagement with the end stop.

2 Claims, 3 Drawing Figures

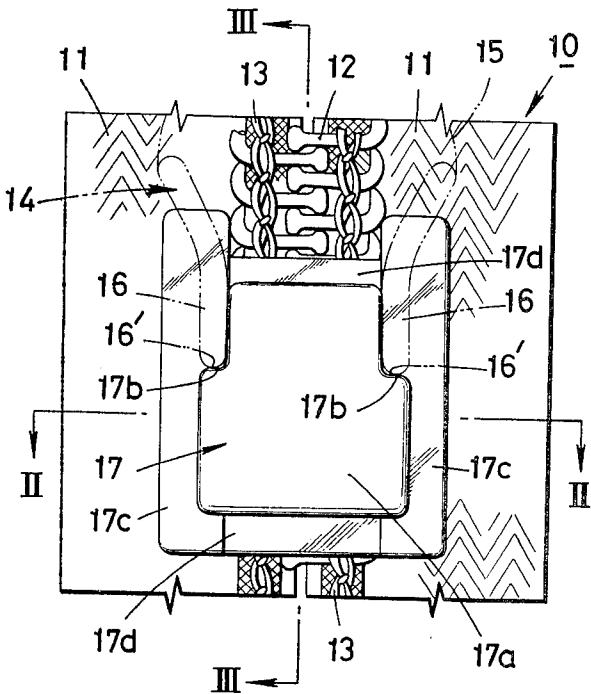


FIG. 1

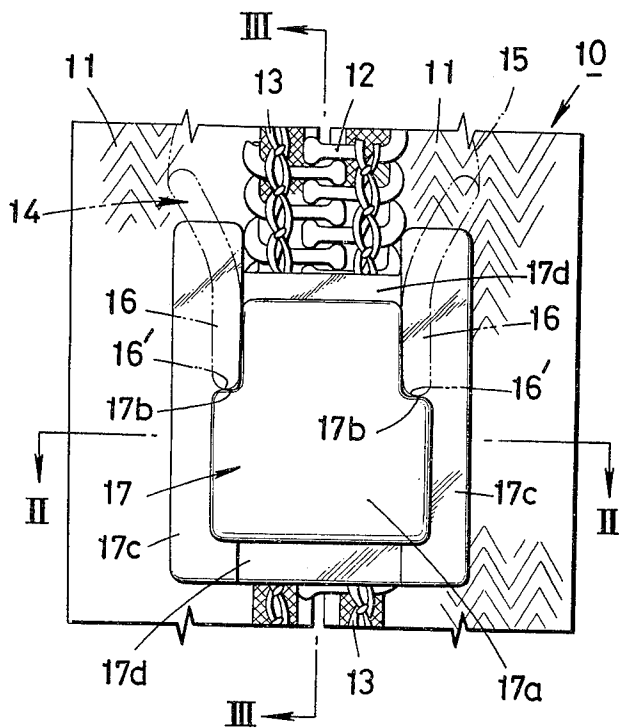


FIG. 3

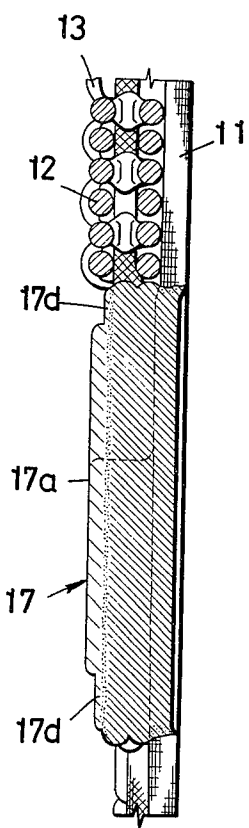
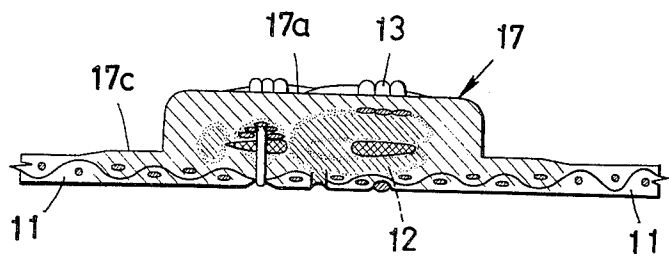


FIG. 2



## END STOP MEMBER FOR SLIDING CLASP FASTENERS

### BACKGROUND OF THE INVENTION

This invention relates to sliding clasp fasteners and more particularly to an improved end stop for use in restricting the movement of the slider thereof.

A sliding clasp fastener contemplated in the practice of the invention comprises a pair of oppositely disposed stringer tapes each carrying along their respective longitudinal edges a row of interlocking fastener elements formed from a continuous plastic filament into a spiral or meandering structure, and a slider arranged to move along the longitudinal edges of the stringer tapes to take the fastener elements into and out of engagement with one another thereby closing and opening the fastener. To restrict the movement of the slider at a predetermined point on the fastener, there are usually employed end stops anchored in place at a top and a bottom end region of the fastener. It is to the bottom end stop which the present invention relates.

There are known different types and forms of bottom end stops for preventing the slider from running off the rows of fastener elements. One such known end stop is formed by simply melting a group of plastic fastener elements together adjacent the bottom end of the fastener. Another end stop known in the art is formed by also melting or fusing a plastic film together with the fastener elements, and causing the molten material to spread over the full width of the fastener, with a stopper element formed at the upper end of the molten region. There is further known an end stop which consists of a relatively narrow plastic film fused to impregnate the fastener over its entire width and a stopper element projecting centrally of the impregnated area for engagement with the slider.

The first mentioned prior art end stop has the disadvantage that it is liable to excessive wear or damage from repeated abutting engagement direct with the neck of the slider connecting its wing members and hence has very short service life.

The aforementioned second end stop is arranged such that the stopper element is brought into impinging contact with the flanged end of the slider, with the results that it is often separated from the fastener tape. Since the plastic film is applied to the entire width of the fastener, this area of the fastener tape becomes stiff, rendering it difficult to run a sewing stitch therealong.

The third known end stop has the drawback that the fastener is susceptible to flexing about the boarder defined between the plastic impregnated region and the non-impregnated region of the fastener where the sewn stitches are restricted to move and hence are liable to become torn off or damaged.

A further disadvantage which is common to the various conventional end stop devices is that when the chain of interlocking fastener elements is broken off, it is extremely difficult to bring the chain completely back into meshed condition.

### SUMMARY OF THE INVENTION

Whereas, it is the primary object of the invention to eliminate most, if not all, of the above noted difficulties of the prior art end stops.

A more specific object of the invention is to provide an improved bottom end stop which is anchored firmly

into position on the fastener against severe impinging forces applied by the slider and which has therefore increased service life.

Another specific object of the invention is to provide an improved bottom end stop which has structural features designed to stabilize the position of both fastener elements and stringer tapes in the vicinity of the end stop and to prevent the tendency of the chain of fastener elements to become broken or ruptured up to a last group of coupled elements adjacent the end stop.

These and other objects and features of the invention will be better understood from the following description of a preferred embodiment taken in connection with the accompanying drawings wherein like reference numerals denote like parts.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a sliding clasp fastener to which a bottom end stop according to the invention is attached;

FIG. 2 is a transverse cross-sectional view taken on the line II—II of FIG. 1; and

FIG. 3 is a longitudinal cross-sectional view taken on the line III—III of FIG. 1.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, there is shown a sliding clasp fastener 10 of the conventional type which comprises a pair of oppositely disposed stringer tapes 11, 11 a row of fastener elements 12 secured by sewing threads 13 to the longitudinal inner edge of each tape 11 and a slider 14 mounted on the fastener for reciprocal movement along the opposed longitudinal edges of the stringer tapes 11, 11 to cause the fastener elements 12 to come into and out of engagement with one another in the usual manner.

The fastener elements 12 are made from a continuous plastic filament and formed into a spiral structure as shown. The slider 14 partly shown in FIG. 1 is of the usual construction consisting generally of spaced-apart upper wing (not shown) and lower wing 15, respectively, inwardly bent to form side flanges 16, 16 and connected by a neck (not shown) in such a manner as to provide substantially a Y-shaped channel for guiding the movement of the fastener elements 12 there-through.

Designated at 17 is a bottom end stop provided in accordance with the invention, which end stop is adapted for restricting or terminating thereat the downward movement of the slider 14 when the latter is manipulated to open the fastener 10. The bottom end stop 17 is made of a plastic material such as thermoplastic resin and consists of a central body 17a adhesively covering a plurality of interengaged fastener elements 12 and having shoulders 17b, 17b laterally projecting for abutting engagement with flange ends 16', 16' respectively of the slider 14, first reduced or thinned-out foil portions 17c, 17c extending longitudinally on opposite sides of the body 17a and adhesively bonded to the respective stringer tapes 11, 11, and second reduced or thinned-out foil portions 17d, 17d extending laterally on opposite ends of the body 17a and downwardly stepped so as to lie below the surface of the body 17a, said portions 17d, 17d being fused together with the fastener elements 12.

With this structure, the central body 17a becomes completely circumferentially surrounded by the first reduced foil portions 17c, 17c and the second reduced foil portions 17d, 17d including upper and lower portions.

The first foil portions 17c, 17c further extend beyond the forward end of the reduced foil upper portion 17d and prevent the tapes 11, 11 thereat from flexing or otherwise moving. This will ensure that when the element chain is cracked open or broken apart, the end-most fastener elements remain in coupled condition thereby greatly facilitating the re-engagement or re-coupling of the rows of fastener elements 12 by the action of the slider 14.

The second foil portions 17d, 17d which are integrally bonded by fusion to fastener elements 12 adjacent opposite ends of the central body 17a serve to bond these elements 12 intimately to the tapes, 11, 11. The second foil portion 17d which is positioned at the forward or upper end of the body 17a does not come directly into abrasive contact with the slider 14 and thereby protects the end stop 17 against detachment from the fastener.

The end stop 17 constructed as above may be provided by means of high-frequency heating or supersonic processing whereby a starting plastic material in the form of a strip, chip or film is moulded into the form illustrated, which is integral with both fastener elements 12 and tapes 11, 11 to provide a unitary bond structure strong enough to withstand severe stresses exerted by the slider 14.

What is claimed is:

1. In a sliding clasp fastener of the type which com-

prises a pair of oppositely disposed stringer tapes each carrying along their respective longitudinal edges a row of interlocking fastener elements made of a continuous plastic filament and a slider having side flanges and mounted on the fastener for reciprocal movement along said longitudinal edge, the improved bottom end stop member for restricting the movement of the slider which end stop member is formed of a thermoplastic material and which consists of a central body adhesively covering a plurality of interengaged fastener elements and having shoulders laterally projecting for abutting engagement with the side flange ends of the slider, further engaged fastener elements extending beyond the ends of said central body first reduced or thinned out foil portions longitudinally extending on opposite sides of said body and adhesively bonded to the respective stringer tapes, and second reduced or thinned-out foil upper and lower portions extending laterally on opposite ends of said body and downwardly stepped so as to lie below the surface of said body thereby preventing the upper portion from coming into abrasive contact with the slider, said central body being completely circumferentially surrounded by said first reduced portions and said second reduced foil upper and lower portions, and said second foil upper and lower portions being fused to said further fastener elements to form a unitary body with said end stop member and said interengaged fastener elements.

2. An improved bottom end stop member as defined in claim 1 wherein said first foil portions extend beyond the forward end of said reduced foil upper portion.

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