

Description

This invention relates generally to slide fasteners and particularly to a bottom end stop therefor which is adapted to restrict the movement of a slider at a bottom or lower end of the fastener.

There are known various forms of a row of coupling elements attached to a pair of stringer tapes, which elements are formed by injection molding of a synthetic resin into discrete individual structures each having a coupling head portion with an engaging recess in front, a barrel portion and a heel portion. A row of such coupling elements are mounted with their barrel portions astride a longitudinal edge of each of a pair of stringer tapes so that their coupling head portions protrude beyond the tape edge for interengagement with corresponding head portions on an opposed companion stringer tape. More specifically, the coupling element includes a narrow neck portion intermediate between the coupling head portion and the barrel portion and a pair of shoulder portions located on opposite sides of the neck portion and having respective engaging ribs engageable with the engaging recesses in the neighboring elements.

A typical example of a bottom end stop for use with coupling elements of the above construction is disclosed in JP-Y-56-37605, which end stop is attached to a pair of stringer tapes at one end thereof in such a manner that it merely overlies and joint part of both the coupling head and heel portions of a terminal one of the coupling elements.

Slide fasteners having the above described coupling elements may be effective for eliminating separation or a so-called "chain crack" of the two interengaged stringers which would take place when the fastener is subjected to upwardly directed thrust or stresses exerted for example from inside a bag fully loaded and tightly closed by the slide fastener. The prior art bottom end stop has a drawback in that since it is simply connected in overlying relation to a terminal or endmost coupling element, the "chain crack" is prone to occur at and from between that particular terminal element and the end stop when the slide fastener receives an external thrust force tending to split the two engaged stringers of the fastener.

It may be theoretically possible to preclude the problem of "chain crack" with the afore-mentioned type of slide fastener by providing a bottom end stop with an extra portion engageable with the engaging rib of the terminal coupling element. However, in as much as such end stops are mostly injection-molded, a hot melt of plastics material in the cavity of the mold tends to leak from the engaging recess in the coupling element and fill up between the coupling head portion of a terminal element and the neck portion of an adjoining coupling element, rendering it difficult to open or close the fasteners.

EP-A-0 287 972, on which the preamble of claim

1 is based, discloses a bottom end stop for a slide fastener, said slide fastener comprising: - a pair of stringer tapes; two rows of discrete coupling elements, one row disposed along and secured to a longitudinal inner edge of each stringer tape; and a slider reciprocally movable along the rows of coupling elements; each coupling element having a bulged coupling head, a first recess formed in a front end of said head, a neck, a barrel, a slot formed in said barrel for mounting said coupling element on said inner edge, first and second shoulders formed between said neck and said barrel, first and second ribs projecting from a respective one of said first and second shoulders towards said head, and a pair of heels extending from a rear end of said barrel;

said bottom end stop being secured to a bottom end portion of each of said stringer tapes and being adapted to restrict the movement of said slider;

wherein said bottom end stop has first and second forked portions defining therebetween a bay for receiving a coupling head of a terminal coupling element, and wherein a second recess is formed in said first forked portion for receiving a rib of said terminal coupling element, said first forked portion extending between said neck and said head of said terminal coupling element.

However, the bottom end stop disclosed in EP-A-0 287 972 is a two-part bottom end stop, with one part of the end stop attached to each stringer tape. Accordingly, the bottom end stop of EP-A-0 287 972 will not be effective at eliminating "chain crack".

In the sliding clasp fastener disclosed in GB-A-1 531 943, which corresponds to the above-mentioned JP-Y-56-37605, there is no clearance between the bottom end stop on the one hand and the terminal coupling element on the other hand, to admit any part of a molding tool.

According to the present invention there is provided a sliding clasp fastener as claimed in claim 1.

The sliding clasp fastener of the invention overcomes the difficulties of the prior art.

The dependent claims 2 to 4 refer to particular embodiments of the slide fastener according to claim 1.

The invention will be described by way of example with reference to the drawings, wherein: -

Figure 1 is a fragmentary plan view of a slide fastener having a bottom end stop embodying the invention;

Figure 2 is a cross-sectional view taken on the line II - II of Figure 1;

Figure 3 is a perspective view of the bottom end stop shown in Figure 1;

Figure 4 is a schematic plan view showing a lower half of a mold used to form the end stop of the invention;

Figure 5 is a perspective view of a coupling element to which the end stop of the invention is ap-

plied; and

Figure 6 is a plan view of a slide fastener carrying the bottom end stop of the invention to restrict the movement of a slider.

Referring now to the drawings and firstly to Figure 6, there is shown a slide fastener F which comprises a pair of stringer tapes T₁ and T₂, a row of discretely arranged coupling elements E secured to and along a longitudinal inner or beaded edge Ta, (Tb) of each of the tapes T₁, T₂ and a slider S reciprocally movable over and along the rows of coupling elements E to take the latter into and out of engagement with each other so as to close and open the slide fastener F in a manner well known in the art.

A bottom end stop 10 embodying the invention is secured to the bottom or lower end portions of the respective tapes T₁ and T₂ and adapted to restrict or limit thereat the movement of the slider S.

A single unit coupling element E, with which the end stop 10 of the invention is associated, is shown in Figure 5. The element E is formed by injection-molding of a plastic material into a multi-shape structure having a bulged coupling head 11 with an engaging recess 12 formed in its front end, a reduced neck 13, a generally square barrel 14 with a slot 15 formed therein for mounting the element E astride the inner edge of the tape T₁ (T₂), shoulders 16a, 16b formed between the neck 13 and the front end of the barrel 14, a pair of engaging ribs 17a, 17b, projecting from the respective shoulders 16a, 16b toward the head 11 and adapted to engage with the recesses 12 of two neighboring elements E and a pair of heels 18a, 18b extending from the rear end of the barrel 14 and adapted as a guide rail for the slider S.

Referring now to Figures 1 - 3 shows a bottom end stop 10 provided in accordance with the invention. The end stop 10 is in the form of a generally rectangular block and has forked portions 19a, 19b at one of its ends defining therebetween a bay 20 for receiving the coupling head 11 of a terminal or endmost element Ea. As better shown in Figure 3, the end stop 10 is provided with longitudinal slots 21a, 21b formed in opposite side walls 22a, 22b for receiving the beaded edges Ta, Tb of the respective stringer tapes T₁, T₂ and with a recess 23 in the forked portion 19a for receiving the engaging rib 17a of the terminal coupling element Ea. The forked portion 19a itself forms a protuberance which extends and fits into the space between the neck 13 and the head 11 of the terminal element Ea. Designated at 24a and 24b are guide rails similar to and aligned with the heels 18a and 18b of the coupling elements E for guided sliding engagement with the side flanges of the slider S. The guide rails 24a and 24b terminate at abutments 25a and 25b respectively, which are formed on opposite sides of the end stop 10 for abutting engagement with the rear end of the slider S to arrest the latter there in place.

Figure 4 schematically illustrates an injection

mold 26 (a lower half part thereof) which may be utilized to form the bottom end stop 10 according to the invention. Prior to the molding operation, a lower end portion of a chain of slide fastener stringers including two to three initial coupling elements E is placed in a non-molding recess 27 of the mold 26.

A molding cavity 28 contiguous to the non-molding recess 27 opens partly into the terminal element Ea so that the forked portion or protuberance 19a of the bottom end stop 10 is formed by the reduced neck 13 of the terminal element Ea. The cavity 28 has a hook-shaped partition 29 for forming the bay 20 of the end stop 10 and for peripherally encompassing the major portion of the bulged head 11 of the terminal element Ea so as to isolate the engaging recess 12 in the head 11 thereby eliminating the penetration or leak of the molding material into the succeeding elements E. The end stop 10 is thus formed by introducing a hot melt of plastics material into the mold 26 via gate 30.

It will be readily apparent from Fig. 4 that, where the hook-shaped partition 29 is, there has to be a clearance provided in the bay 20 for a major portion of the coupling head 11 of said terminal coupling element Ea, said clearance serving, during the molding of the bottom end stop 10, to admit the hook-shaped partition 29. This clearance is very visible in Fig. 1.

Claims

1. A slide fastener (F) comprising: - a bottom end stop (10); a pair of stringer tapes (T₁, T₂); two rows of discrete coupling elements (E), one row disposed along and secured to a longitudinal inner edge (Ta, Tb) of each stringer tape (T₁, T₂); and a slider (S) reciprocally movable along the rows of coupling elements (E); each coupling element (E) having a bulged coupling head (11), a first recess (12) formed in a front end of said head (11), a reduced neck (13), a barrel (14), a slot (15) formed in said barrel (14) for mounting said coupling element (E) on said inner edge (Ta, Tb), first and second shoulders (16a, 16b) formed between said neck (13) and said barrel (14), first and second ribs (17a, 17b) each projecting from a respective one of said first and second shoulders (16a, 16b) towards said head (11), and a pair of heels (18a, 18b) extending from a rear end of said barrel (14);

said bottom end stop (10) being secured to a bottom end portion of each of said stringer tapes (T₁, T₂) and being adapted to restrict the movement of said slider (S);

wherein said bottom end stop (10) has first and second portions (19a, 19b) forming a fork and defining therebetween a bay (20) for receiving a coupling head (11) of a terminal coupling



plied; and

Figure 6 is a plan view of a slide fastener carrying the bottom end stop of the invention to restrict the movement of a slider.

Referring now to the drawings and firstly to Figure 6, there is shown a slide fastener F which comprises a pair of stringer tapes T₁ and T₂, a row of discretely arranged coupling elements E secured to and along a longitudinal inner or beaded edge Ta, (Tb) of each of the tapes T₁, T₂ and a slider S reciprocally movable over and along the rows of coupling elements E to take the latter into and out of engagement with each other so as to close and open the slide fastener F in a manner well known in the art.

A bottom end stop 10 embodying the invention is secured to the bottom or lower end portions of the respective tapes T₁ and T₂ and adapted to restrict or limit thereat the movement of the slider S.

A single unit coupling element E, with which the end stop 10 of the invention is associated, is shown in Figure 5. The element E is formed by injection-molding of a plastic material into a multi-shape structure having a bulged coupling head 11 with an engaging recess 12 formed in its front end, a reduced neck 13, a generally square barrel 14 with a slot 15 formed therein for mounting the element E astride the inner edge of the tape T₁ (T₂), shoulders 16a, 16b formed between the neck 13 and the front end of the barrel 14, a pair of engaging ribs 17a, 17b, projecting from the respective shoulders 16a, 16b toward the head 11 and adapted to engage with the recesses 12 of two neighboring elements E and a pair of heels 18a, 18b extending from the rear end of the barrel 14 and adapted as a guide rail for the slider S.

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Figure 4 schematically illustrates an injection

mold 26 (a lower half part thereof) which may be utilized to form the bottom end stop 10 according to the invention. Prior to the molding operation, a lower end portion of a chain of slide fastener stringers including two to three initial coupling elements E is placed in a non-molding recess 27 of the mold 26.

A molding cavity 28 contiguous to the non-molding recess 27 opens partly into the terminal element Ea so that the forked portion or protuberance 19a of the bottom end stop 10 is formed by the reduced neck 13 of the terminal element Ea. The cavity 28 has a hook-shaped partition 29 for forming the bay 20 of the end stop 10 and for peripherally encompassing the major portion of the bulged head 11 of the terminal element Ea so as to isolate the engaging recess 12 in the head 11 thereby eliminating the penetration or leak of the molding material into the succeeding elements E. The end stop 10 is thus formed by introducing a hot melt of plastics material into the mold 26 via gate 30.

It will be readily apparent from Fig. 4 that, where the hook-shaped partition 29 is, there has to be a clearance provided in the bay 20 for a major portion of the coupling head 11 of said terminal coupling element Ea, said clearance serving, during the molding of the bottom end stop 10, to admit the hook-shaped partition 29. This clearance is very visible in Fig. 1.

Claims

1. A slide fastener (F) comprising: - a bottom end stop (10); a pair of stringer tapes (T₁, T₂); two rows of discrete coupling elements (E), one row disposed along and secured to a longitudinal inner edge (Ta, Tb) of each stringer tape (T₁, T₂); and a slider (S) reciprocally movable along the rows of coupling elements (E); each coupling element (E) having a bulged coupling head (11), a first recess (12) formed in a front end of said head (11), a reduced neck (13), a barrel (14), a slot (15) formed in said barrel (14) for mounting said coupling element (E) on said inner edge (Ta, Tb), first and second shoulders (16a, 16b) formed between said neck (13) and said barrel (14), first and second ribs (17a, 17b) each projecting from a respective one of said first and second shoulders (16a, 16b) towards said head (11), and a pair of heels (18a, 18b) extending from a rear end of said barrel (14);

said bottom end stop (10) being secured to a bottom end portion of each of said stringer tapes (T₁, T₂) and being adapted to restrict the movement of said slider (S);

wherein said bottom end stop (10) has first and second portions (19a, 19b) forming a fork and defining therebetween a bay (20) for receiving a coupling head (11) of a terminal coupling



element (Ea), and wherein a second recess (23) is formed in said first fork-forming portion (19a) for receiving a rib (17a) of said terminal coupling element (Ea), said first fork-forming portion (19a) extending between said neck (13) and said head (11) of said terminal coupling element (Ea);

the slide fastener (F) being characterised in that the bottom end stop is a one-piece bottom stop (10); in that it is formed by injection-molding a plastics material onto said stringer tapes (T₁, T₂) after said coupling elements (E) have been attached to said stringer tapes (T₁, T₂); and in that a clearance is provided in the bay (20) for a major portion of the coupling head (11) of said terminal coupling element (Ea), said clearance serving, during the molding of the bottom end stop (10), to admit a hook-shaped partition (29) of a molding cavity (28) of an injection mold (26), the said partition (29) in use forming the bay (20) of the end stop (10) and peripherally encompassing said major portion of the bulged head (11) of the terminal element (Ea) so as to isolate the engaging recess (12) therein.

2. A slide fastener according to claim 1 characterized in that the bottom end stop (10) further includes longitudinal slots (21a, 21b) in opposite sides thereof for receiving the inner edges (Ta, Tb) of said tapes (T₁, T₂).
3. A slide fastener according to claim 1 characterized in that the bottom end stop (10) further includes guide rails (24a, 24b) similar to and aligned with the heels (18a, 18b) of said coupling elements (E) for guided engagement with said slider (S).
4. A slide fastener according to claim 1 characterized in that the bottom end stop (10) further includes abutments (25a, 25b) at which said guide rails (24a, 24b) respectively terminate and which are abuttingly engageable with the rear end of said slider (S) to arrest the latter in place.

Patentansprüche

1. Reißverschluß (F), umfassend: - ein unteres Begrenzungsteil (10); zwei Tragbänder (T₁, T₂); Reihen einzelner Kuppelglieder (E), wobei jeweils eine Reihe entlang einem inneren Längsrand (Ta, Tb) jedes Tragbandes (T₁, T₂) angeordnet und befestigt ist; und einen Schieber (S), der längs der Kuppelgliederreihen (E) hin- und herbewegbar ist; wobei jedes Kuppelglied (E) einen ausgebauchten Kupplungskopf (11), eine in einem vorderen Ende des Kupplungskopfes (11) ausgebildete erste Ausnehmung (12), einen verjüngten

Hals (13), einen Rumpf (14), einen in dem Rumpf (14) ausgebildeten Schlitz (15) zum Anbringen des Kuppelglieds (E) an dem inneren Rand (Ta, Tb), erste und zweite zwischen dem Hals (13) und dem Rumpf (14) gebildete Schultern (16a, 16b), von der ersten und zweiten Schulter (16a, 16b) zum Kupplungskopf (11) hin vorspringende erste und zweiten Rippen (17a, 17b) und zwei vom hinteren Ende des Rumpfes (14) ausgehende Haken (18a, 18b) hat;

wobei das untere Begrenzungsteil (10) an einem unteren Endbereich jedes Tragbandes (T₁, T₂) befestigt ist und die Bewegung des Schiebers (S) begrenzen kann;

wobei das untere Begrenzungsteil (10) erste und zweite Bereiche (19a, 19b) hat, die eine Gabel bilden und dazwischen eine Bucht (20) zur Aufnahme des Kupplungskopfes (11) eines endseitigen Kuppelglieds (Ea) begrenzen, und wobei in dem ersten die Gabel bildenden Bereich (19a) eine zweite Ausnehmung (23) ausgebildet ist, um eine Rippe (17a) des endseitigen Kuppelglieds (Ea) aufzunehmen, wobei sich der erste die Gabel bildende Bereich (19a) zwischen dem Hals (13) und dem Kupplungskopf (11) des endseitigen Kuppelglieds (Ea) erstreckt;

wobei der Reißverschluß (F) dadurch gekennzeichnet ist, daß das untere Begrenzungsteil ein einstückiges Begrenzungsteil (10) ist; daß es durch Spritzgießen eines Kunststoffmaterials auf die Tragbänder (T₁, T₂) gebildet ist, nachdem die Kuppelglieder (E) an den Tragbändern (T₁, T₂) befestigt wurden; und daß in der Bucht (20) ein Zwischenraum für den Hauptbereich des Kupplungskopfes (11) des endseitigen Kuppelglieds (Ea) vorgesehen ist, wobei dieser Zwischenraum beim Gießen des unteren Begrenzungsteils (10) dazu dient, eine hakenförmige Trennwand (29) eines Formhohlraums (28) einer Spritzgießform (26) aufzunehmen, wobei diese Trennwand (29) im Gebrauch die Bucht (20) des Begrenzungsteils (10) formt und den Hauptbereich des ausgebauchten Kopfes (11) des endseitigen Kuppelglieds (Ea) umschließt, um die darin angeordnete Eingriffsausnehmung (12) abzuschotten.

2. Reißverschluß nach Anspruch 1, dadurch gekennzeichnet, daß das untere Begrenzungsteil (10) ferner an gegenüberliegenden Seiten Längsschlitze (21a, 21b) zur Aufnahme der Innenränder (Ta, Tb) der Tragbänder (T₁, T₂) aufweist.
3. Reißverschluß nach Anspruch 1, dadurch gekennzeichnet, daß das untere Begrenzungsteil (10) ferner Führungsschienen (24a, 24b) aufweist, die den Haken (18a, 18b) der Kuppelglieder (E) ähneln und mit diesen zum geführten Ein-



griff mit dem Schieber (S) fluchten.

4. Reißverschluß nach Anspruch 1, dadurch gekennzeichnet, daß das untere Begrenzungsstück (10) ferner Anschläge (25a, 25b) aufweist, an denen die Führungsschienen (24a, 24b) enden und an denen das hintere Ende des Schiebers (S) zur Anlage gelangt, um diesen festzulegen.

Revendications

1. Fermeture à glissière (F) qui comprend :

- une butée (10) d'extrémité inférieure,
- une paire de bandes d'accrochage (T_1 , T_2),
- deux rangées d'éléments d'accouplement (E) séparés, une rangée étant placée le long du bord longitudinal intérieur (T_a , T_b) de chaque bande d'accrochage (T_1 , T_2) en lui étant fixée, et
- un curseur (S) déplaçable en va-et-vient le long des rangées d'éléments d'accouplement (E),

chaque élément d'accouplement (E) comportant une tête d'accouplement (11) renflée, un premier évidement (12) formé dans l'extrémité avant de ladite tête, un col (13) plus étroit, un corps (14), une fente (15) formée dans ledit corps (14) pour monter ledit élément d'accouplement (E) sur ledit bord intérieur (T_a , T_b), des premières et secondes épaules (16a, 16b) formées entre ledit col (13) et ledit corps (14), des premières et secondes nervures (17a, 17b) dépassant chacune de l'une respective desdites épaules (16a, 16b) en direction de ladite tête (11), et une paire de talons (18a, 18b) partant de l'extrémité arrière dudit corps (14),

ladite butée d'extrémité inférieure (10) étant fixée à la partie d'extrémité inférieure de chacune desdites bandes d'accrochage (T_1 , T_2) et étant apte à arrêter le mouvement dudit curseur (S),

dans laquelle ladite butée d'extrémité inférieure (10) comprend des première et seconde parties (19a, 19b) qui forment une fourche et définissent entre elles une baie (20) pour recevoir la tête d'accouplement (11) d'un élément terminal d'accouplement (E_a) et dans laquelle un second évidement (23) est formé dans ladite première partie (19a) formant la fourche pour recevoir une nervure (17a) dudit élément terminal d'accouplement (E_a), ladite première partie (19a) qui forme la fourche s'étendant entre ledit col (13) et ladite tête (11) dudit élément terminal d'accouplement (E_a),

la fermeture à glissière (F) étant caractérisée en ce que la butée d'extrémité inférieure est une butée d'extrémité (10) en une seule pièce, en

ce qu'elle est formée par moulage par injection d'une matière plastique sur lesdites bandes d'accrochage (T_1 , T_2) après que lesdits éléments d'accouplement (E) ont été fixés auxdites bandes d'accrochage (T_1 , T_2) et en ce qu'un jeu est prévu dans la baie (20) pour une partie principale de la tête d'accouplement (11) dudit élément terminal d'accouplement (E_a), ledit jeu servant, pendant le moulage de la butée d'extrémité inférieure (10) à recevoir une cloison (29) en forme de crochet de la cavité de moulage (28) d'un moule d'injection (26), l'utilisation de ladite cloison formant la baie (20) de ladite butée d'extrémité (10) et entourant la périphérie de ladite partie principale de la tête renflée (11) de l'élément terminal (E_a) afin d'isoler l'évidement de mise en prise (12) qui s'y trouve.

2. Fermeture à glissière selon la revendication 1, caractérisée en ce que la butée d'extrémité inférieure (10) comprend en outre des fentes longitudinales (21a, 21b) dans ses côtés opposés pour recevoir les bords intérieurs (T_a , T_b) desdites bandes d'accrochage (T_1 , T_2).

3. Fermeture à glissière selon la revendication 1, caractérisée en ce que la butée d'extrémité inférieure (10) inclut en outre des rails de guidage (24a, 24b) semblables aux talons (18a, 18b), avec lesquels ils sont alignés, desdits éléments d'accouplement (E) destinés à un engagement guidé avec ledit curseur (S).

4. Fermeture à glissière selon la revendication 1, caractérisée en ce que la butée d'extrémité inférieure (10) inclut en outre des arrêts (25a, 25b) au niveau desquels se terminent respectivement lesdits rails de guidage (24a, 24b) et qui viennent en contact aboutant avec l'extrémité arrière dudit curseur (S) pour arrêter ce dernier en place.