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Harlam et al.

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[45] **March 6, 1973**

[54] **SLIDER CONSTRUCTION FOR SEPARABLE FASTENERS**

[75] Inventors: **Gerald F. Harlam; Marian A. Okolowicz,** both of Providence, R.I.

[73] Assignee: **Pilling Chain Co. Inc.,** West Barrington, R.I.

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[52] **U.S. Cl.** ..... **24/205.15 R**

[51] **Int. Cl.** **A44b 19/26**

[58] **Field of Search** ..... 26/205.15, 205.15 H

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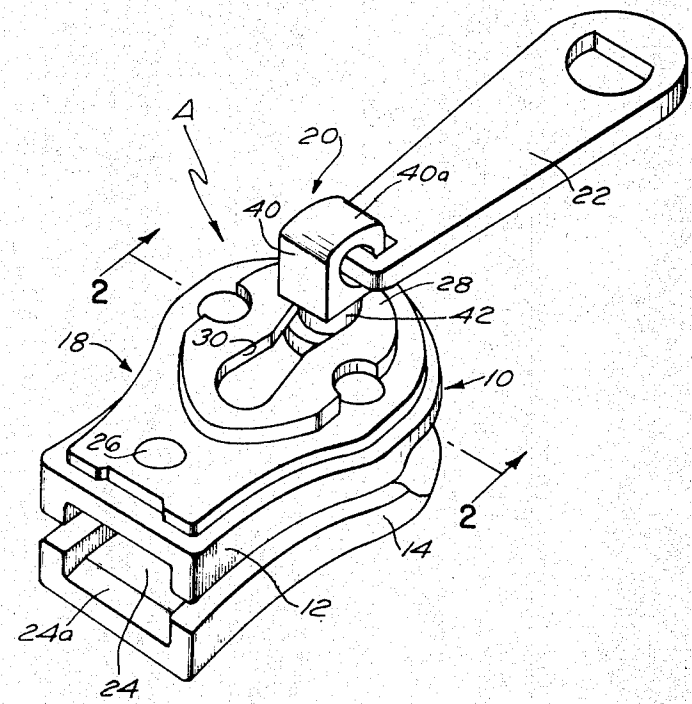
Primary Examiner—Bernard A. Gelak

Attorney—Salter & Michaelson

[57] **ABSTRACT**

A slide fastener including a cast slider body to which is attached a cast plate member, the plate member having a generally longitudinally extending slot formed therein for slidably receiving a rotatable swivel pin to which a tab device is attached, the plate member and slot formed therein being so fashioned that upon manipulation of the tab device and swivel pin, the latter is guided along a precisely defined path, such that there results greater ease of travel of the slider body around corners and the like, thereby effectively improving upon the reliability of the fastener assembly.

6 Claims, 5 Drawing Figures



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SHEET 1 OF 2

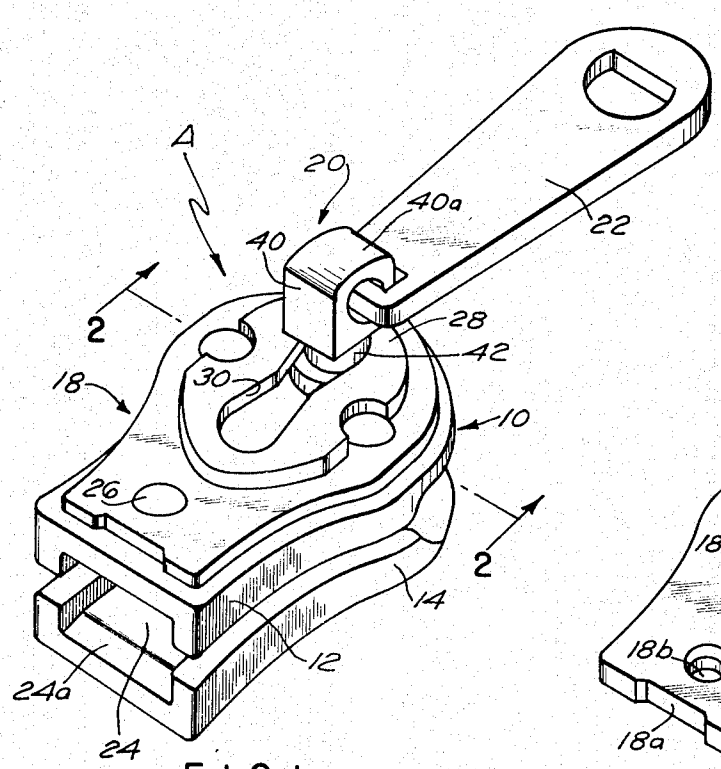


FIG. 1

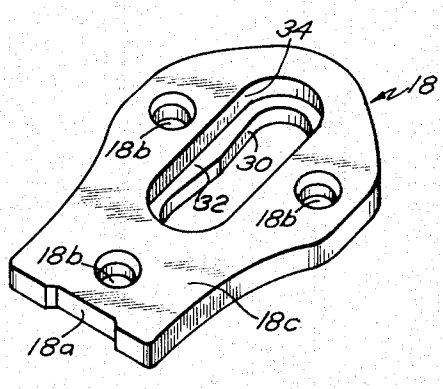


FIG. 3

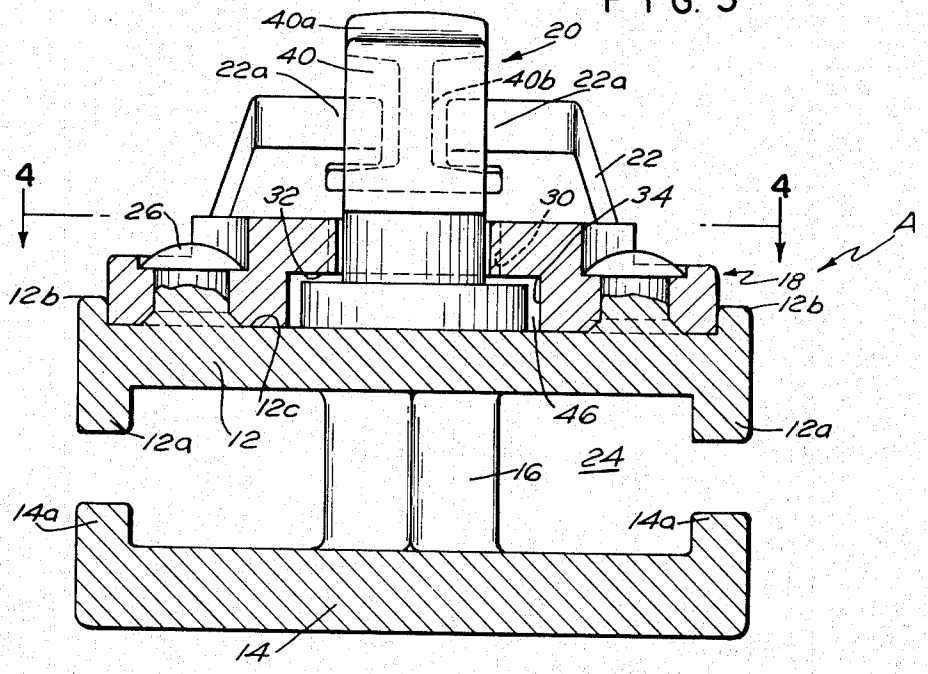


FIG. 2

INVENTORS
GERALD F. HARLAM
MARIAN A. OKOLOWICZ
BY Salter & Michaelson
ATTORNEYS

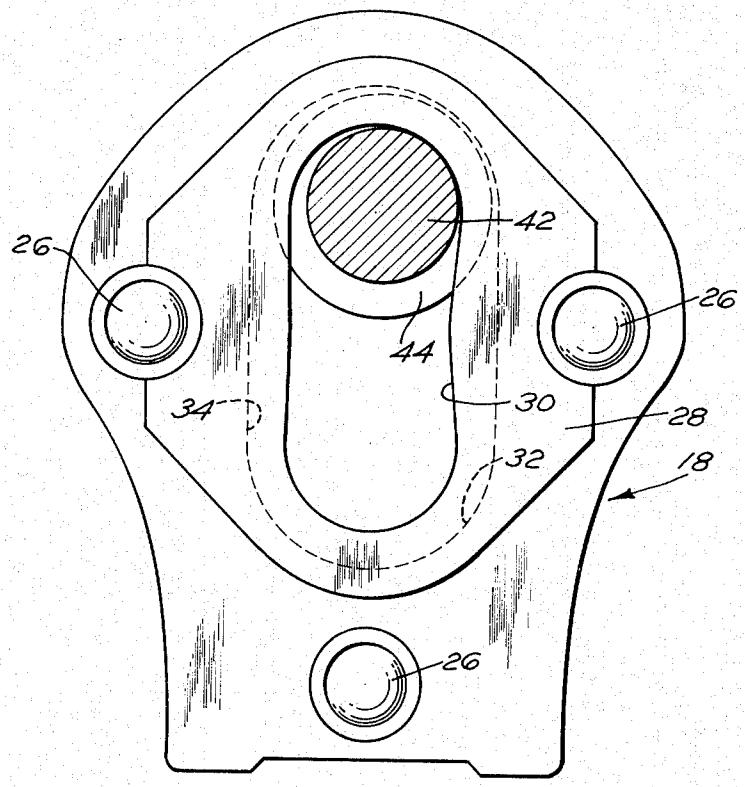


FIG. 4

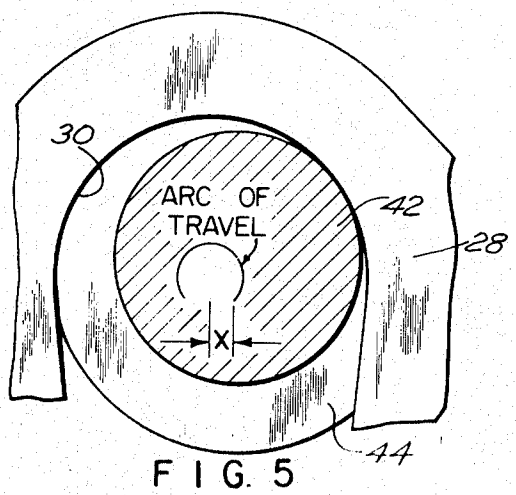


FIG. 5

INVENTORS
GERALD F. HARLAM
MARIAN A. OKOLOWICZ
BY Sutter & Rudnick
ATTORNEYS

SLIDER CONSTRUCTION FOR SEPARABLE FASTENERS

BACKGROUND OF THE INVENTION

The present invention has application in zipper assemblies and more particularly in those zipper assemblies that are incorporated in articles such as luggage, wherein the zipper slider is moved around corners during the opening or closing of the zipper assembly.

Prior to the instant invention, zipper assemblies have been normally constructed such that the tab attached to the slider body was fixed relative to the longitudinal axis of the slider body. Consequently, when the zipper assembly was incorporated in articles which required movement of the slider body around corners, cocking or jamming of the slider body occurred since a lateral twisting component of force was applied to the tab.

It is known in the art to which this invention pertains to provide a slider body for separable fasteners, wherein the top wall of the slider body is formed with an elongated recess or depression into which is fitted an elongated washer slidably receiving a swivel pin having a pull tab attached thereto. In the arrangements as previously known, the transverse dimensions of the recess in the slider body top wall and the washer channel were generally uniform throughout the length thereof, and while a degree of swivel movement of the pin with respect to the slider body recess and washer was theoretically provided, experience has shown that in the constructions described, it was often quite difficult to manipulate the slider body over relatively sharp contoured surfaces, as around corners normally encountered in luggage and the like, with the result that even when dexterity and substantial manual forces were utilized, cocking and jamming of the slider assembly was often quite difficult to avoid. Further, the prior known constructions included stamped and machined parts which greatly increased the cost of manufacture and assembly thereof.

SUMMARY OF THE INVENTION

The present invention is directed to a slide fastener assembly having a cast slider body and to the top wall portion of which is pinned or otherwise secured thereto a cast plate member. Formed in the plate member is a slot having an elongated "hour glass" configuration which generally centrally of the opposite longitudinal ends thereof is convergent or has a reduced transverse dimension. The slot as formed in the plate member has an interior shoulder which defines an opening in the plate member that is transversely greater than the slot and which cooperates with the slider body to receive a swivel pin therein in sliding relation. The slot is dimensioned to provide for offset movement of the swivel pin as the slider assembly moves around a corner of an article, wherein a torque component is created that assists in the travel of the slider body in the non-linear direction. Thus an important aspect of the invention is the provision of an "hour glass" guide slot in the slider body assembly which assures development of a force component during movement of the swivel pin which is off-set of non-linear with respect to the longitudinal centerline of the guide channel or slot and slider body, such that when the swivel pin reaches the longitudinal extremities of the slot during pulling or pushing of the tab device, ease of movement of the slider body around the corners or curved surfaces of a piece of luggage or the like is readily accomplished, with essentially no likelihood of jamming or cocking of the slider assembly.

Other objects, features and advantages of the invention shall become apparent as the description thereof proceeds when considered in connection with the accompanying illustrative drawings.

DESCRIPTION OF THE DRAWINGS

In the drawings which illustrate the best mode presently contemplate for carrying out the present invention:

FIG. **1** is a perspective view of a slider assembly constructed in accordance with the novel aspects of the present invention;

FIG. **2** is a vertical sectional view taken substantially along the line **2—2** of FIG. **1**;

FIG. **3** is a bottom perspective view of the plate member of this invention to illustrate more fully the guide groove configuration;

FIG. **4** is a top plan view of the plate member as viewed along the line **4—4** of FIG. **2**; and

FIG. **5** is an enlarged fragmentary diagrammatic view of a portion of the plate member with the swivel pin received therein to even more clearly show the relative positioning of the parts during travel of the slider assembly.

DESCRIPTION OF THE INVENTION

The slider assembly as embodied in the present invention has particular application for use in a zipper unit, wherein the stringers or chain of the zipper unit are secured on an article in non-linear relation, such as in luggage and other similar articles. As will be described, the slider assembly of the subject invention is designed to freely travel through the non-linear or rounded portions of the stringers without jamming or cocking.

Referring now first to FIGS. **1** and **2** of the drawings, there is shown a slider assembly generally designated by the legend A and which comprises a slider body **10** that is preferably cast in a one-piece integral unit and includes a first or upper wall portion **12** and a second or lower wall portion **14** integrally associated therewith, the wall portions **12** and **14** being spaced apart by an integral connecting portion **16**. The slider assembly A further includes a cast plate member **18** which, as will be described, is separately attached to the slider body top wall portion **12** and slidably receives in cooperation therewith a swivel pin **20** having a tab device **22** connected thereto for imparting a push-pull action to the slider body **10** to couple or uncouple the stringers of the seperable fastener. The swivel pin **20** is also cast as a separate unit, while the tab device **22** is preferably stamped out in the configuration illustrated.

The first or upper wall portion **12** and the second or lower wall portion **14** are formed with discontinuous rim sections **12*a*** and **14*a***, respectively, which define with the post or fastening means **16** a channel **24** having a bevelled entrant opening **24*a*** at one or both ends thereof for reception of the separable fastener stringers (not shown). Cast integrally onto the upper surface **12*c*** of the top wall portion **12** are a plurality of upstanding posts or units **26**, preferably three in number, that are

receivable in appropriately spaced openings 18*b* of the plate 18 for securing the plate 18 to the slider body 10 as further described hereinafter. The upper wall portion 12 of the slider body 10 is also provided with a peripheral lip 12*b* against which bears in seating relation therewith the marginal edge portion of the plate member 18 conveniently recessed at one end as at 18*a*, the plate member 18 being attached to the upper plate portion 12 by the rivets 26 in the manner shown in FIG. 2.

Referring now also to FIG. 3, it will be seen that desirably the plate member 18 generally matches the upper wall portion 12 of the slider body 10 in peripheral contour, and that for ease of assembly the plate member 18 has the openings 18*b* formed therein that are preferably recessed at both ends thereof to receive the rivet means 26 so as to effect attachment of the plate member 18 to the slider body 10. The plate member 18, in accordance with this invention, is precisely contoured on its upper surface thereof with an embossment 28 in which a slot 30 having a semi-elliptical or "hour glass" configuration is formed. Indented under the slot 30 is a shoulder 32 which merges with a substantially elliptical aperture or opening 34 that extends through the lower wall 18*c* of the plate member 18 for the purpose presently to be described.

The swivel pin 20 is formed with an upstanding head portion 40 to which a reduced diameter neck portion 42 is joined. Integrally joined to the reduced neck portion 42 at the lower end thereof is a cylindrical portion 44 that is sized to slide within a passageway 46 defined by the upper surface 12*c* of the slider body top wall portion 12 and the shoulder 32 and opening 34 formed in the plate member 18. As shown in FIGS. 1 and 2, the head portion 40 of the pin member 20 is rounded along the upper surface as at 40*a*, and is formed with diametrically opposed recesses 40*b* which receive therein tongue portions 22*a* of the tab device 22.

As previously described, the slider body 10, plate member 18 and pin 20 are all individually cast and as such can be produced in quantity with a minimum cost. Further, the casting method enables the details of these parts to be obtained which cannot be duplicated by machining. The only element of the assembly that is not cast is the tab 22 which is stamped out in a conventional operation.

In the assembly of the elements, the head portion 40*a* of the pin 40 is first inserted through the opening 34 and slot 30 until the base portion 44 is received beneath the shoulder 32, the lateral dimension of the opening 34 being sufficient to receive the base portion 44 therein; but the diameter of the base portion 44 being greater than the lateral dimension of the slot 30. The assembled pin 40 and plate member 18 are then mounted on the slider body 10, the peripheral contour of the plate member being snugly received within the peripheral lip 12*b* of the wall portion 12, and the rivets 26 being received within the openings 18*b* formed in the plate member 18. The base portion 44 of the pin 40 is slidably entrapped beneath the shoulder 32 while the head portion 40*a* of the pin 40 projects above the embossment 28 of the plate member 18. The assembly is completed by peening over the heads of the rivets 26 to lock the plate member 18 on the slider body 10 and the tab device 22 is attached to the head portion 40 by inserting the tongue portions 22*a* in the recesses 40*b* and squeezing them inwardly to the locked position thereof.

In describing the operation of the slider assembly as embodied in the present invention, reference is now made to FIGS. 4 and 5; and it is assumed that the slider assembly A is mounted for sliding movement on zipper stringers or fasteners (not shown) that are secured in any conventional manner to an article, wherein at least three edges of a cover member are detachable from the main body portion of the article such as in luggage or the like. In this connection, portions of the zipper stringers or fasteners are disposed in non-linear relation and it is necessary for the slider assembly A to travel around corners during the opening or closing of the zipper fasteners.

With the slider body 10 positioned on the stringers of the article, and assuming a pulling force is exerted on the tab device 22 in a direction that is parallel to the longitudinal axis of the slot 30, the swivel pin 20 will be pulled to an end of the slot 30, such that the base portion 44 contacts an end wall of the slot 30. A continued pulling action on the tab device will then cause the slider body 10 to move along the stringers in a closing or unclosing action in a conventional manner. As the slider body 10 approaches a corner of the article cover which requires that the slider body change its direction of travel approximately 90°, the tab device 22 is rotated which rotates the swivel pin 20. A continued pulling action on the tab device would normally cause the slider body 10 to cock and possibly jam as it moves around the corner. However, in the present invention the end portions of the slot 30 are dimensioned so as to provide for non-axial movement of the base portion 44 with respect to the slot 30, whereby the swivel pin 20 is moved along an arc as seen in FIG. 5 to an offset position relative to the longitudinal axis of the slot 30 and the opening 34 that communicates with the slot 30. As illustrated in FIG. 4, the neck portion 42 limits the non-axial movement of the slider body as it engages the peripheral edges of the slot 30.

With the swivel pin 20 having been moved a distance X (FIG. 5) to the offset position, a component of force is created upon continued pulling action on the swivel pin that is directed against the peripheral edges of the slot 30 and opening 34. This component of force defines a torque component of approximately 45° that causes the slider body 10 to move easily around the corner of the article on the zipper stringers without jamming or cocking. Movement of the slider body 10 in the changed direction continues as the swivel pin 20 is rotated and moved back such that the axis thereof lies along the longitudinal axis of the slot 30.

It is seen that the slider assembly embodied in the present invention may be inexpensively constructed and assembled by automatic machinery and that in use thereof, the slider body is traversed around the corners of an article without jamming or cocking on the zipper stringers.

While there is shown and described herein certain specific structure embodying the invention, it will be manifest to those skilled in the art that various modifications and rearrangements of the parts may be made without departing from the spirit and scope of the underlying inventive concept and that the same is not limited to the particular forms herein shown and

described except insofar as indicated by the scope of the appended claims.

We claim:

1. A slider assembly comprising a slider body having spaced upper and lower wall portions, a plate member joined to said upper wall portion and having an elongated opening formed in a surface thereof, an elongated slot formed in the opposite surface of said plate member that communicates with said opening, the lateral dimensions of said slot being less than that of said opening to define an interior shoulder, a swivel pin including a base portion that is dimensioned for being received in said opening but that is restricted from movement into said slot by said interior shoulder, a reduced neck portion joined to said base portion and extending through said slot and terminating in a head portion to which a tab device is joined, said swivel pin being rotatable in said slot and movable the length of said slot depending on the direction of travel of said slider assembly, the diametrical dimension of said neck portion of said swivel pin being less than the transverse dimension of the ends of said slot, wherein the axis of the swivel pin is moved to a position that is offset with respect to the longitudinal axis of said slot, so that the component of force created when the tap device is pulled outwardly will act to move the slider assembly more easily in a non-linear direction, and canting and/or cocking thereof is prevented, said slot in said plate member having a semi-elliptical hour-glass configuration that guides said neck portion to the offset position at an end portion of said slot when said slider assembly is moved in a non-linear direction.

2. A slider assembly, comprising a slider body having spaced upper and lower wall portions, said upper wall portion having a plurality of upstanding posts joined thereto in spaced apart relation, a plate member having a configuration generally corresponding to that of said upper wall portion and being formed with openings therein that are located in spaced relation corresponding to that of said posts, said plate member being received on said upper wall portion and said posts extending through said openings for securement therein, wherein said plate member is fixed to said slider body, and a pin assembly mounted on said plate member and being operable to produce movement of said slider assembly, a lip extending upwardly and around substantially the entire peripheral edge of said upper wall portion, said plate member being snugly received within said peripheral lip when said posts extend through said openings in said plate member, said plate member having an embossment formed on the upper surface thereof, a slot formed in said embossment and communicating with an opening formed in the body of the plate member thereunder, said pin assembly including a base portion that is entrapped in said opening and a neck portion joined to said base portion and that extends through said slot, a head portion joined to the neck portion and extending upwardly therefrom and receiving a tab device on which an outwardly extending force is exerted for moving said slider assembly, said slot and opening being elongated to provide for axial travel of said pin assembly in the initial operation of said slider assembly, and the pin assembly being rotatable within said slot and opening to provide for location of said tab device in that position for exerting the most direct component of force relative to said slider assembly.

3. A slider assembly comprising a slider body having spaced upper and lower wall portions, a plate member joined to said upper wall portion and having an elongated opening formed in a surface thereof, an elongated slot formed in the opposite surface of said plate member that communicates with said opening, the lateral dimension of said slot being less than that of said opening to define an interior shoulder, a swivel pin including a base portion that is dimensioned for being received in said opening but that is restricted from movement into said slot by said interior shoulder, a reduced neck portion joined to said base portion and extending through said slot and terminating in a head portion to which a tab device is joined, said swivel pin being rotatable in said slot and moveable the length of said slot depending on the direction of travel of said slider assembly, the diametrical dimension of said neck portion of said swivel pin being less than the transverse dimension of the ends of said slot, wherein the axis of the swivel pin is moved to a position that is offset with respect to the longitudinal axis of said slot, so that the component of force created when the tab device is pulled outwardly will act to move the slider assembly more easily in a non-linear direction, and canting and/or cocking thereof is prevented, said upper wall portion of said slider body having a plurality of upstanding spaced posts integrally formed thereon, said plate member having a configuration corresponding generally to that of the upper wall portion and being formed with a plurality of openings that are located in corresponding relation with respect to said posts and fixedly receiving the posts therein, said plate member overlying the upper wall portion of said slider body in face-to-face relation and being permanently attached thereto by said posts, said plate member being interfitted on the upper wall portion of said slider body in such a manner that shear deflection of said plate member is resisted when said tab device is pulled outwardly in moving the slider assembly in a non-linear direction.

4. A slider assembly as set forth in claim 3, said plate member having an embossment formed on the upper surface thereof in which said slot is formed, the thickness of the embossment being substantially the thickness of said slot.

5. A slider assembly as set forth in claim 3, means formed on the upper wall portion of said slider body for interfitting said plate member and cooperating with said posts to resist shear deflection when said tab device is pulled outwardly in moving the slider assembly in the non-linear direction.

6. A slider assembly as set forth in claim 5, said interfitting means including a lip extending upwardly and around substantially the entire peripheral edge of said upper wall portion, wherein said plate member is snugly received within said peripheral lip.

* * * * *