Aug. 26, 1952 A. ZAHEL 2,607,976

UNLOCKABLE SLIDE FOR HOOKLESS FASTENERS

Filed May 17, 1949 3 Sheets-Sheet 1

FIG. 1.

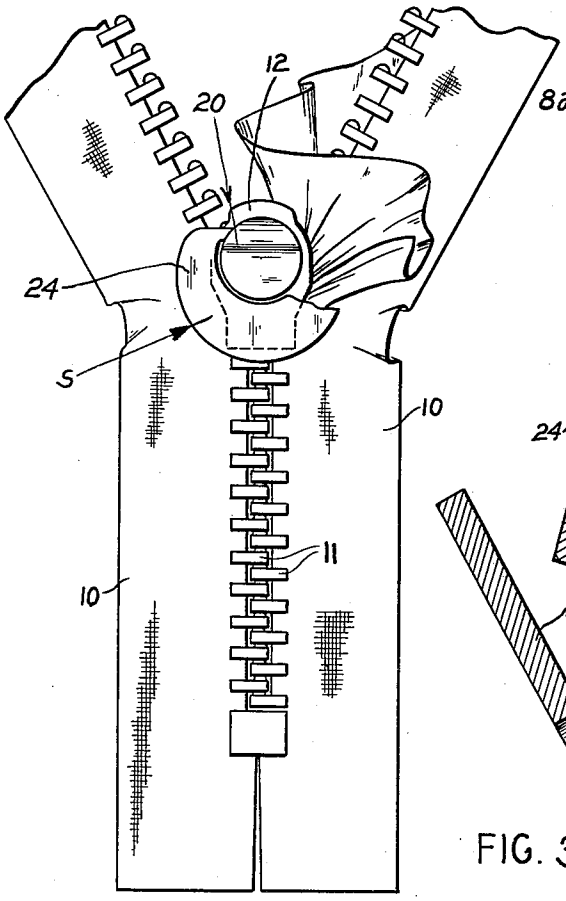


FIG. 2.

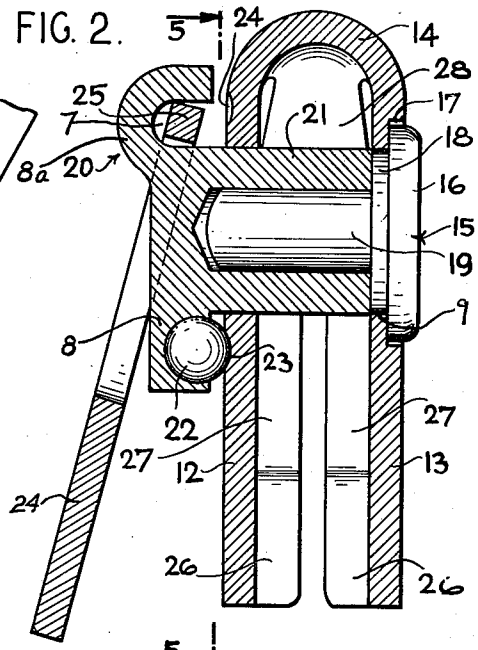


FIG. 3.

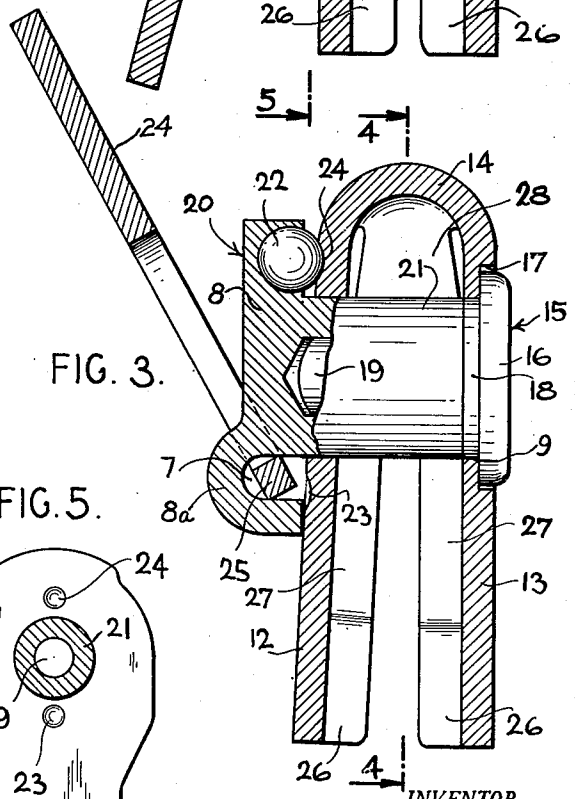


FIG. 4

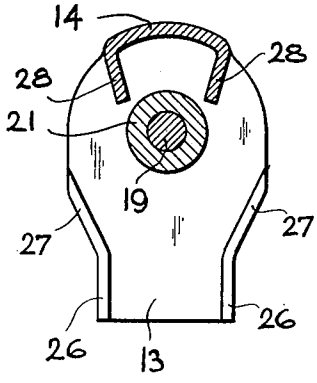


FIG. 5.

INVENTOR.
ALEX ZAHEL

BY

Mock & Blum

ATTORNEYS.

Aug. 26, 1952 A. ZAHEL 2,607,976

UNLOCKABLE SLIDE FOR HOOKLESS FASTENERS

Filed May 17, 1949 3 Sheets-Sheet 2

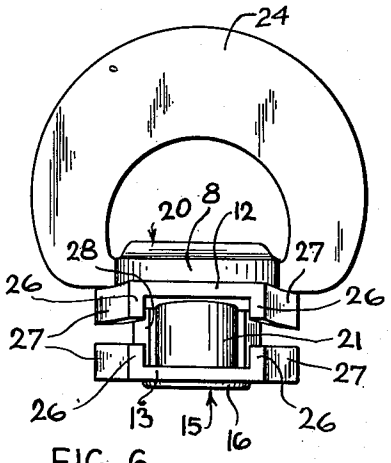


FIG. 6.

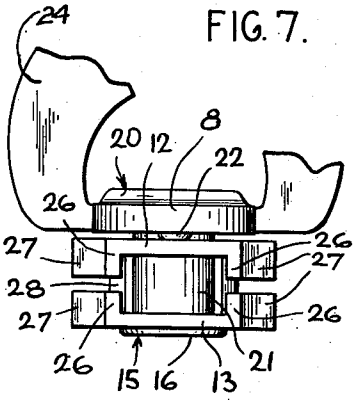


FIG. 7.

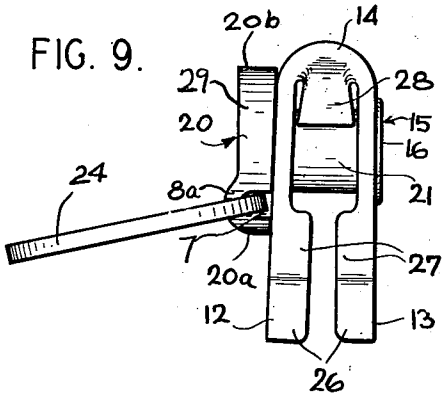


FIG. 9.

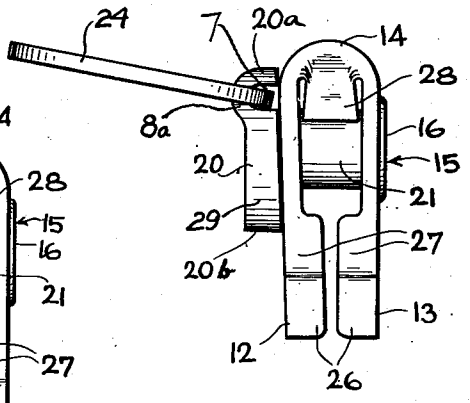


FIG. 10.

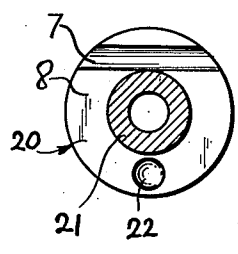


FIG. 8.

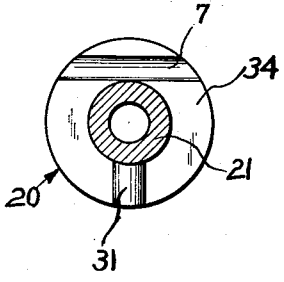


FIG. 17.

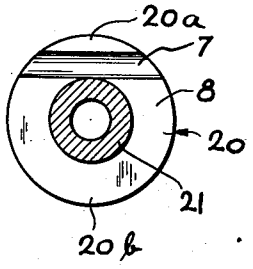


FIG. 11.

INVENTOR.
ALEX ZAHEL

BY

ATTORNEYS.

Aug. 26, 1952 A. ZAHEL 2,607,976

UNLOCKABLE SLIDE FOR HOOKLESS FASTENERS

Filed May 17, 1949 3 Sheets-Sheet 3

FIG. 12.

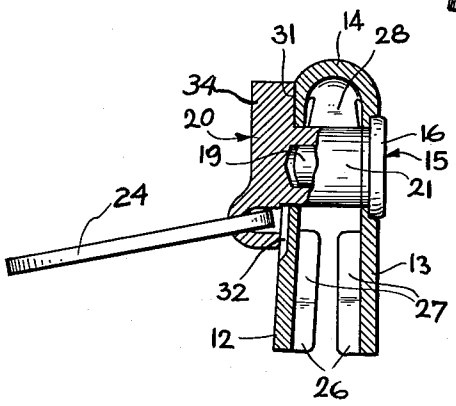


FIG. 13.

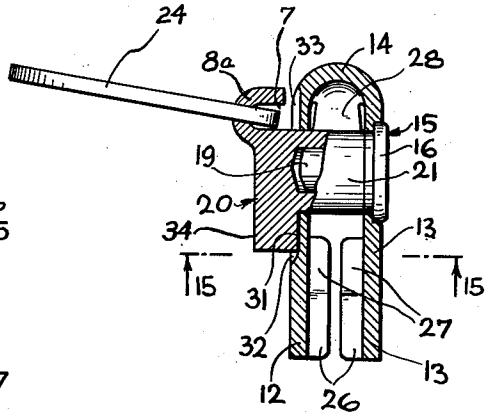


FIG. 14.

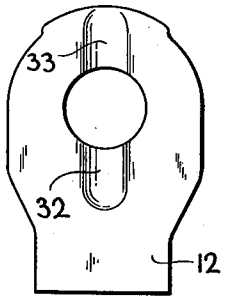


FIG. 15.

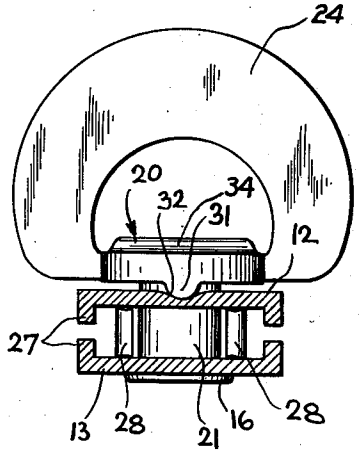
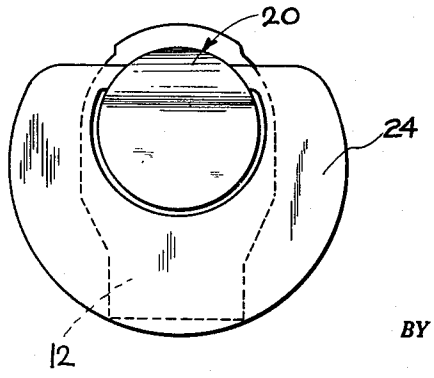


FIG. 16.



INVENTOR.
ALEX ZAHEL

BY

Mock & Blum

ATTORNEYS.

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UNITED STATES PATENT OFFICE

2,607,976

UNLOCKABLE SLIDE FOR HOOKLESS FASTENERS

Alex Zahel, Yorktown Heights, N. Y., assignor, by mesne assignments, to Kee Zipper Corporation, New York, N. Y., a corporation of New York

Application May 17, 1949, Serial No. 93,791

8 Claims. (Cl. 24—205.15)

1

This invention relates to a new and improved slider for hookless fasteners or zippers.

It is known to make a slider whose body has two parallel and longitudinal walls whose rear ends are separated from each other, and whose front ends are integral with a transverse yoke. The rear end-part of each said wall has been provided with two parallel and longitudinal edge-flanges, which serve as guides for the longitudinal to-and-fro movement of the slide. The intermediate part of each said wall has been provided with two edge-flanges which are inclined to each other, and which diverge forwardly. These divergent edge-flanges are throat-flanges which interengage the zipper elements when the slide is moved forwardly in its locking direction.

The slide may accidentally engage the fabric of the flexible stringers or garment or other article which is provided with the zipper fastener. The zipper elements may accidentally jam with each other or with the slide.

According to this invention, the transverse yoke is resilient. If the longitudinal walls are free to move relative to each other, said yoke maintains said longitudinal walls inclined to each other and rearwardly divergent. When said walls are thus inclined to each other, the slider can be moved forwardly in its locking direction without interengaging the zipper elements, because the transverse flanges of said walls then sufficiently clear the bases of the zipper elements. If there is a jam for any reason, or if the slider engages the fabric of the garment or other article, said longitudinal walls are caused to assume said divergent or non-operating positions. The slider can then be moved forwardly in its normal locking direction without interengaging the zipper elements.

An improved transverse post-assembly is provided between said resilient yoke and the rear ends of said longitudinal walls. Each longitudinal wall is provided with a transverse bore between said yoke and its rear end. One of the elements or parts of said post-assembly is a transverse pin which has a bearing-flange of greater width than said pin, and an enlarged outer end-head. Said bearing-flange fits turnably in a bore of one longitudinal wall and said enlarged end-head turnably abuts a part of said wall.

The second or other part or element of said post-assembly includes a socket or sleeve whose outer cylindrical wall fits turnably in the bore of the respective longitudinal wall. Said other part or element of the post-assembly also has a head which is external to the respective longitudinal wall.

2

Said transverse pin is located in the recess of said socket, and said socket and pin are fixed to each other, as by a force-fit or drive fit.

Said head and the outer face of the respective adjacent longitudinal wall are shaped to provide cam-means or pressure means.

When the post-assembly is turned to a selected release position, said longitudinal walls are moved to said divergent or non-operating positions by the flexure of the resilient yoke.

When said post-assembly is turned to a selected holding position, the longitudinal walls are moved towards each other from said divergent or non-operating positions against the flexure of the yoke, until the throat-flanges of said longitudinal walls are in operating position to interengage the zipper elements when the slider is moved forwardly.

The transverse resilient yoke may be under zero flexure or under selected flexure when said transverse post-assembly is turned to its selected release position.

This construction makes it possible quickly and cheaply to assemble the parts of the post-assembly with the preformed body of the slider.

In the preferred embodiment, the head of the second part or element has a turnable anti-friction member assembled therewith, and located between said head and the outer face of the respective adjacent longitudinal wall, and said outer face is optionally and preferably planar. Said anti-friction member is preferably a ball, which has a bearing in the inner face of said head. Said ball contacts at all times with the outer face of the respective adjacent longitudinal wall. Said outer face is optionally and preferably provided with respective recesses, in which said ball is partially located in the release and holding positions of said post-assembly. Said recesses are longitudinally spaced, and they may be in longitudinal registration, so that the post-assembly is turned 180° between its release position and its holding position. When said ball registers with the front recess, the flexure of the resilient yoke maintains the longitudinal walls in their divergent and non-operating positions.

When said ball registers with the rear recess, said walls are maintained preferably parallel to each other, in their operating positions.

When the slider is moved rearwardly, the outer wall of said socket, which is optionally and preferably cylindrical, disengages the zipper elements.

Other objects and advantages and features of my invention are disclosed in the annexed description and drawings, which illustrate three preferred embodiments thereof.

Figs. 1 and 16 are common to the three embodiments. The other figures of the first embodiment are Figs. 2–8. The other figures of the second embodiment are Figs. 9–11. The other figures of the third embodiment are Figs. 12–15 and Fig. 17.

Fig. 1 is a top plan view which shows two longitudinal rows of hookless fastener or zipper elements, whose bases are fixed to the usual flexible stringers or fabric pieces. The zipper elements are shown as interengaged at one end of the stringers. A piece of fabric is shown as caught in the slider. Part of the representation of the slider has been omitted. The longitudinal walls of the body of the slider are parallel to each other, and in their operating positions;

Fig. 2 is a longitudinal section of the slider, partially in side elevation. The longitudinal walls of the slider are shown parallel to each other, in their operating positions;

Fig. 3 is similar to Fig. 2, showing the longitudinal walls of the slider in transversely divergent and non-operating positions;

Fig. 4 is a section on the line 4—4 of Fig. 3;

Fig. 5 is a section on the line 5—5 of Fig. 2;

Fig. 6 is a rear end elevation of the slider, with its longitudinal walls divergent, corresponding to Fig. 3;

Fig. 7 is a view similar to Fig. 6, when the longitudinal walls of the slider are parallel to each other, corresponding to Fig. 2. Part of the representation of the handle of the slider has been omitted;

Fig. 8 is an inner plan view of the head of the post-assembly;

Fig. 9 is a side elevation of the slider of the second embodiment, with its longitudinal walls divergent, as in Fig. 3;

Fig. 10 is similar to Fig. 9, showing said longitudinal walls parallel, as in Fig. 2;

Fig. 11 is an inner plan view of the head of the post-assembly of the second embodiment;

Fig. 12 is a longitudinal section, partially in side elevation, of the slider of the third embodiment, showing its longitudinal walls divergent, as in Fig. 3;

Fig. 13 is similar to Fig. 12, showing said longitudinal walls parallel, as in Fig. 2;

Fig. 14 is a top plan view of the body of the slider of the third embodiment, with the turnable post-assembly removed;

Fig. 15 is a lateral section along the line 15—15 of Fig. 13;

Fig. 16 is a top plan view of the slider of the respective three embodiments; and

Fig. 17 is a bottom plan view of the head of the turnable post-assembly of the third embodiment.

First embodiment

The body of slide S has longitudinal walls 12 and 13, connected at their front ends by a resilient and integral transverse front yoke 14, which normally holds walls 12 and 13 in the divergent positions of Fig. 3, unless walls 12 and 13 are subjected to a counter-force to hold them in the parallel positions of Fig. 2.

These walls 12 and 13 are identical. As shown in Fig. 4, each wall has a rear end-portion of uniform width which has parallel, transverse guide flanges 26, an outwardly tapered intermediate portion which has outwardly divergent and transverse throat flanges 27, and a rear portion whose shape is shown accurately in Fig. 4.

Front yoke 14 is integral with parallel and longitudinal tongues 28, which are located intermediate walls 12 and 13 and which limit their angular movement towards each other. Said tongues 28 may abut or be very close to the inner faces of walls 12 and 13, when said walls are in the parallel operating positions of Fig. 2.

Fig. 1 shows conventional zipper elements 11, arranged in two longitudinal rows, and having bases which are fixed to the flexible stringers or fabric pieces 10.

Fig. 1 shows the zipper elements 11 interengaged below slide S.

Wall 13 has a cylindrical bore 9, which is adjacent a cylindrical recess 17 of wall 13.

The transverse cylindrical pin 19 is integral with cylindrical bearing-flange 18, which is located wholly in bore 9 and which fits closely and turnably in bore 9. Flange 18 is integral with end-head 16, which turnably abuts the inner annular wall of recess 17. The parts 19, 18, 16 comprise a pin-unit 15 of the post-assembly.

This transverse pin-unit 15 is assembled with a transverse socket-unit 20, which has a head 8 which is integral with a socket or sleeve 21. This sleeve 21 has an outer cylindrical wall, which fits turnably in a bore of wall 12. Said sleeve 21 has an inner cylindrical face, in which pin 19 is located. The free or inner end-wall of sleeve 21 abuts bearing flange 18. Sleeve 21 and pin 19 are permanently assembled by a force fit or other means. The units 20 and 15 thus form a post-assembly which is freely turnable relative to walls 12 and 13.

At one end thereof, head 8 has a rib 8*a* which provides a channel recess 7, which is open adjacent wall 12.

The handle 24 has a cut-out which provides an end-bar 25, which is located turnably in channel recess 7. The post-assembly can be turned by handle 24, which is also tiltable relative to the post-assembly.

At the end opposed to channel recess 7, head 8 has a bearing recess of part-spherical shape, in which part of a ball 22 is turnably located.

The outer face of wall 12 is planar and it has two longitudinally alined and shallow recesses 23 and 24, of part-spherical shape.

When the post-assembly 20—15 is turned by handle 24 to the release position of Fig. 3, a part of ball 22 interfits with front recess 24, close to resilient yoke 14, which is then free to turn walls 12 and 13 to the divergent positions of Fig. 3. While walls 12 and 13 are in said divergent or non-operating positions, slider S can be moved forwardly of its position of Fig. 1, without interengaging the zipper elements 11. The jam can thus be easily cleared, because the guide flanges 26 and the throat flanges 27 clear the zipper elements 11 while walls 12 and 13 are in said divergent positions.

The resilience of yoke 14 releasably holds balls 22 in registration with front recess 24.

Upon exerting sufficient turning force by means of handle 24, the post-assembly 20—15 is turned to the holding position of Fig. 2, in which ball 22 is in registration with the rear recess 23, thus releasably holding walls 12 and 13 in their operating positions. During this turning movement, the freely rotating ball 22 and the planar outer face of wall 12 operate as anti-friction cam-means.

The units 20 and 15 can be easily assembled with each other and with ball 22 and the preformed units 12—14—13, preferably while the ball 22 is in temporary registration with front recess

24, especially if sleeve 21 and pin 19 have a force fit or drive fit.

The anti-friction ball 22 and end-head 16 prevent any axial movement of post-assembly 20—15 relative to walls 12 and 13.

Second embodiment

The post-assembly 20—15 is the same as the first embodiment, save that ball 22 and recesses 23 and 24 are omitted, and the second unit 20 has a cam-head 29. Said head 29 is thicker at its end 20*b* than at its end 20*a* and said thickness varies uniformly between ends 20*b* and 20*a*, so that the inner face of the turnable head 29 operates as a cam member.

When the thick end 20*b* is located forwardly and adjacent yoke 14, the walls 12 and 13 are in the divergent position of Fig. 9, which corresponds to Fig. 3.

When the thick end 20*b* is located rearwardly, as shown in Fig. 10, the walls 12 and 13 are in the same parallel position as in Fig. 2.

In this embodiment, as in the first embodiment, the post-assembly is turned through an arc of 180° from one selected release position to another selected holding position.

Third embodiment

This is generally the same as the second embodiment, save for a modified head 34 of unit 20. This head 34 has a convex cam nose 31, which is preferably of part-cylindrical shape.

As shown in Fig. 14, the outer face of wall 12 has longitudinal and longitudinally alined concave recesses 33 and 34, which have concave walls. The curvature of the convex part of cam-nose 31 is preferably greater than the curvature of the concave walls of recesses 33 and 34.

The cam-nose 31 and grooves 33 and 32 cooperate in the same manner as the ball 22 and recesses 24 and 23 of the first embodiment.

In each embodiment the two parts of the turnable post-assembly may be fixed or connected to each other in any manner.

The first embodiment is highly preferred.

When the slider is moved rearwardly to disengage the interengaged zipper elements 11, the cylindrical sleeve 21 operates to tilt the zipper elements so as to disengage them.

The ball 22 is, in effect, a part of the inner face of the head 8 of the first embodiment.

Hence, in each embodiment, the inner face of the head 8, 29, or 34 and the outer face of the respective adjacent longitudinal wall 12, are shaped to provide cam-means to force the longitudinal walls 12 and 13 to their operating positions, and to maintain said walls 12 and 13 in their operating positions. In the second embodiment, there is full contact between the inner face of head 29 and the outer face of wall 12, when the post-assembly is in holding position. There is sufficient friction between said abutting faces to releasably hold the post-assembly in its holding position.

Preferred embodiments of this invention have been disclosed, but numerous changes and omissions and additions can be made without departing from its scope.

I claim:

1. A slider for hookless fasteners, said slider having a body which has longitudinal walls whose front ends are joined by a transverse resilient yoke, the rear ends of said walls being transversely movable relative to each other, each said wall having a transverse bore between its front end and its rear end, a transverse and turnable post-assembly which includes a pin unit and a socket unit, each said unit being associated with a respective longitudinal wall, said pin unit including a pin which is located between said walls and which extends turnably through one of said bores, said pin unit having an end-stop-head which turnably abuts the respective associated adjacent longitudinal wall, the socket unit including a socket member which has an outer wall which fits turnably in the bore of the respective associated longitudinal wall, said pin being located in said socket member and being fixed to said socket member, said socket unit including a head which is external to the respective associated longitudinal wall, an anti-friction member connected to said head and contacting the outer face of the associated longitudinal wall, said post-assembly being turnable to a selected release position and to a selected holding position, said longitudinal walls having transverse throat flanges which are forwardly divergent, said outer face having longitudinally spaced front and rear recesses, said anti-friction member being located partially in said front recess when said post-assembly is in said release position, said anti-friction member being located partially in said rear recess when said post-assembly is in said holding position, the flexure of said yoke maintaining said throat-flanges in non-operating position when said post-assembly is in said release position, said anti-friction member and said end-head forcing said longitudinal walls towards each other to move said throat flanges to operating positions when said post-assembly is turned to its selected holding position.

2. A slider according to claim 1, in which said pin unit has a bearing flange intermediate said pin and said end-stop-head, said bearing flange being of greater width than said pin and of less width than said end-stop-head, the edge-wall of said socket member abutting said bearing flange.

3. A slider according to claim 1, in which said pin unit has a bearing flange intermediate said pin and said end-stop-head, said bearing flange being of greater width than said pin and of less width than said end-stop-head, the edge-wall of said socket member abutting said bearing flange, said pin and said socket member having a force fit.

4. A slider according to claim 1, in which said yoke is under flexure when said post-assembly is in said release position.

5. A slide for longitudinally disposed hookless fasteners, said slide having longitudinal top and bottom walls, said walls having front and rear ends, said rear ends being integral with a resilient rear transverse yoke which biases said walls transversely away from each other to selected separated positions, said walls having flange means which are operative and located to slidably engage and interlock the hookless fasteners when said slide is moved longitudinally rearwardly relative to said hookless fasteners, a transverse pin turnably connected to the bottom wall of said slide and extending through an opening of said top wall and being turnable about its axis relative to both walls, said pin having an enlarged head which abuts the upper face of said top wall, the bottom of said head having a portion comprising an anti-friction member which is turnably positioned within a recess in the bottom face of said head and which extends below the remainder of said head, said head portion being

positioned forwardly of said pin in a first turned position of said pin, said head portion then forcing said longitudinal walls against the action of said yoke toward each other from said selected separated positions to selected proximate positions, said head portion being positioned rearwardly of said pin in a second turned position of said pin, the flexure of said yoke then overcoming the force of said head portion on said walls, said walls to move them to said selected separated positions, said walls being closer to each other in said selected proximate positions than in said selected separated positions, said pin being located and operative to separate said hookless fasteners when said slide is moved longitudinally forwardly.

6. A slide in accordance with claim 5, in which said top wall has depressions in the upper face thereof which are respectively positioned forwardly and rearwardly of said pin, said anti-friction member being partially located within said front depression in said first turned position of said pin, said anti-friction member being partially located in said rear depression in said second turned position of said pin, said anti-friction member being removable from both said depressions by exerting a force on said head to turn same about the axis of said pin.

7. A slide for longitudinally disposed hookless fasteners, said slide having longitudinal top and bottom walls, said walls having front and rear ends, said rear ends being integral with a resilient rear transverse yoke which biases said walls transversely away from each other to selected separated positions, said walls having flange means which are operative and located to slidably engage and interlock the hookless fasteners when said slide is moved longitudinally rearwardly relative to said hookless fasteners, a transverse pin turnably connected to the bottom wall of said slide and extending through an opening of said top wall and being turnable about its axis relative to both walls, said pin having an enlarged head which abuts the upper face of said top wall, the bottom of said head having a portion comprising an anti-friction member which is turnably positioned within a recess in the bottom face of said head and which extends below the remainder of said head, said head portion being positioned forwardly of said pin in a first turned position of said pin, said head portion then forcing said longitudinal walls against the action of said yoke toward each other from said selected separated positions to selected proximate positions, said head portion being positioned rearwardly of said pin in a second turned position of said pin, the flexure of said yoke then overcoming the force of said head portion on said walls, said walls to move them to said selected separated positions, said walls being closer to each other in said selected proximate positions than in said selected separated positions.

8. A slide in accordance with claim 7, in which said top wall has depressions in the upper face thereof which are respectively positioned forwardly and rearwardly of said pin, said anti-friction member being partially located within said front depression in said first turned position of said pin, said anti-friction member being partially located in said rear depression in said second turned position of said pin, said anti-friction member being removable from both said depressions by exerting a force on said head to turn same about the axis of said pin.

ALEX ZAHEL.

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