Dec. 26, 1950 F. W. CLARKE 2,535,391

END STOP FOR SLIDE FASTENERS

Filed March 23, 1946 3 Sheets-Sheet 1

Fig. 1.

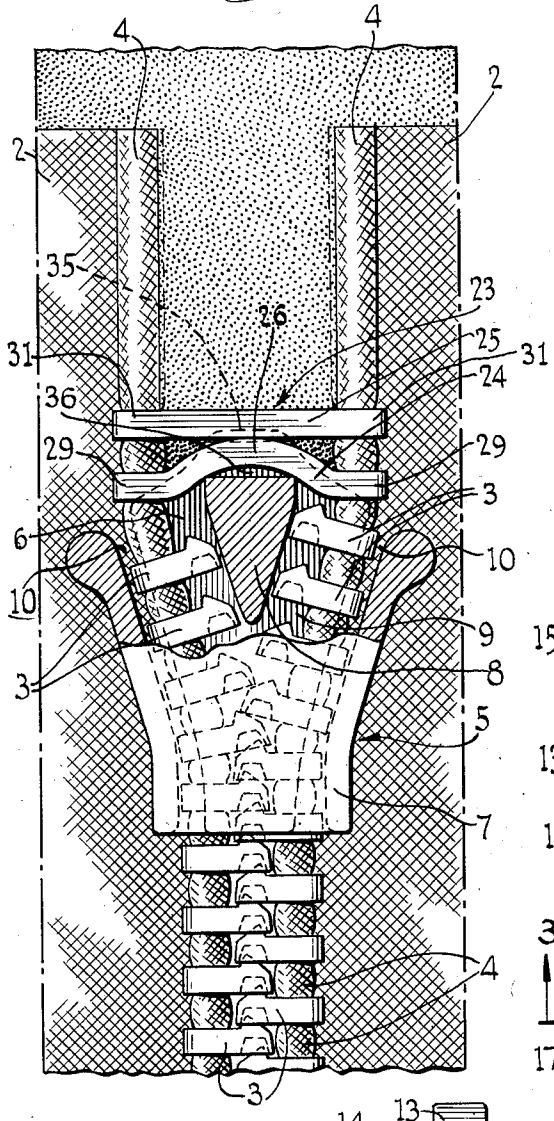


Fig. 2.

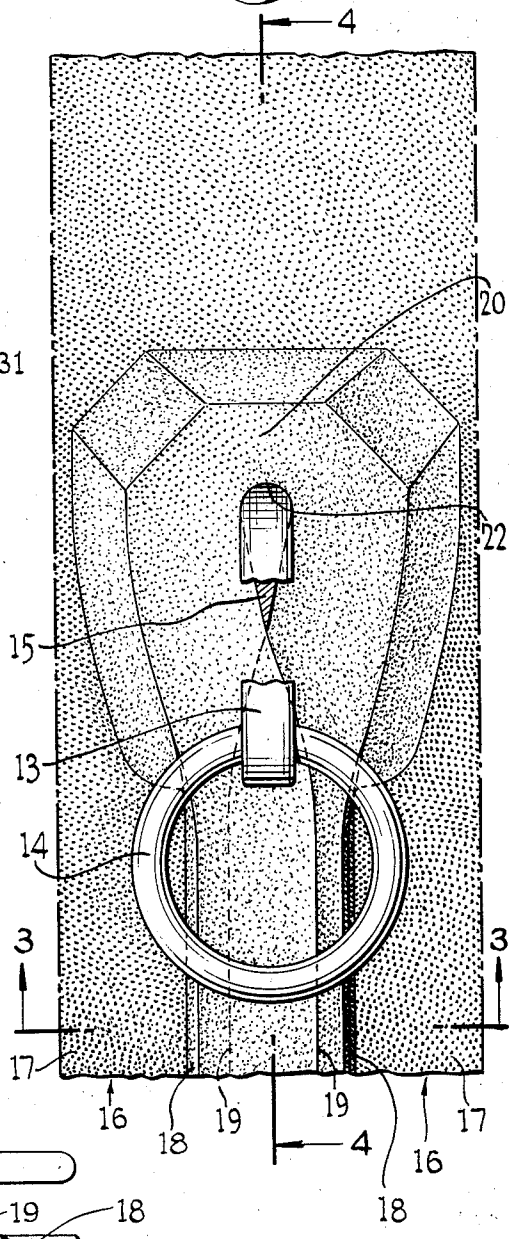
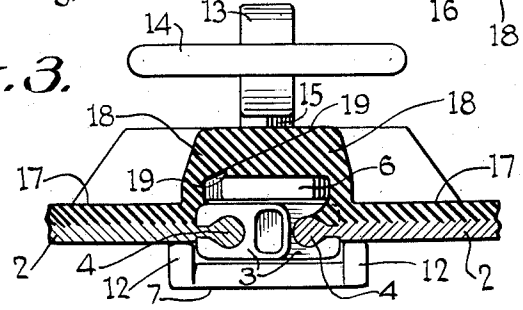


Fig. 3.



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Filed March 23, 1946 3 Sheets-Sheet 2

Fig. 4.

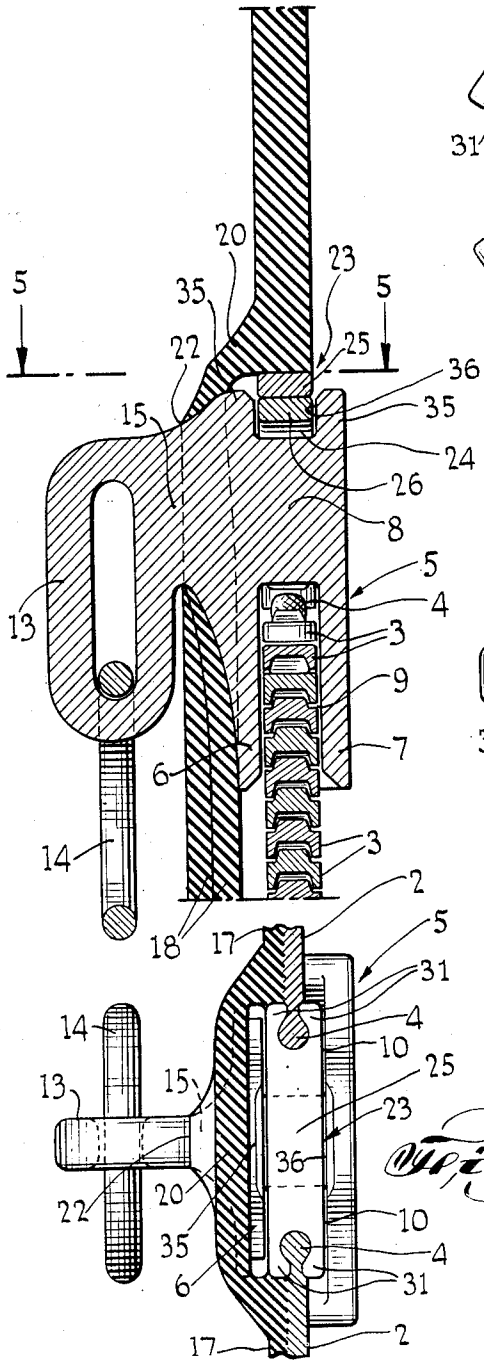


Fig. 9.

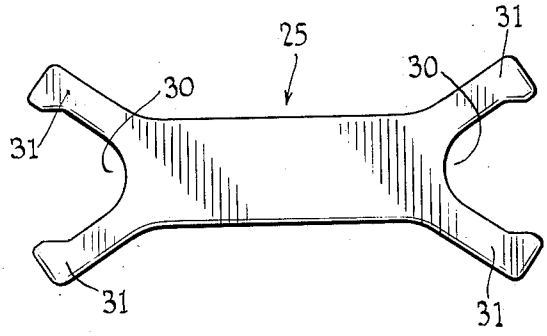


Fig. 10.

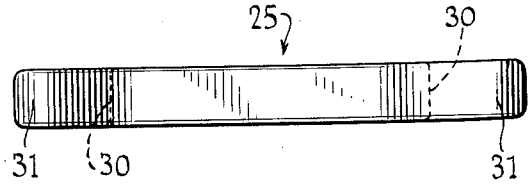


Fig. 11.

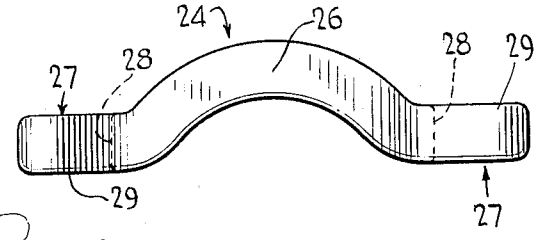


Fig. 5.

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Dec. 26, 1950 F. W. CLARKE 2,535,391

END STOP FOR SLIDE FASTENERS

Filed March 23, 1946 3 Sheets-Sheet 3

Fig. 6.

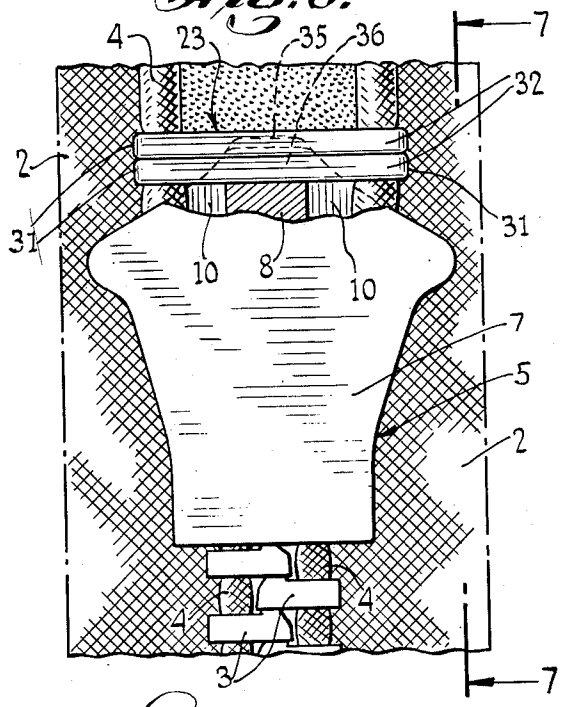


Fig. 7.

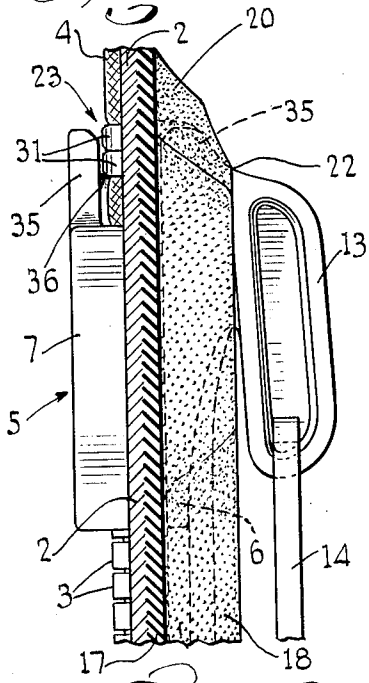


Fig. 8.

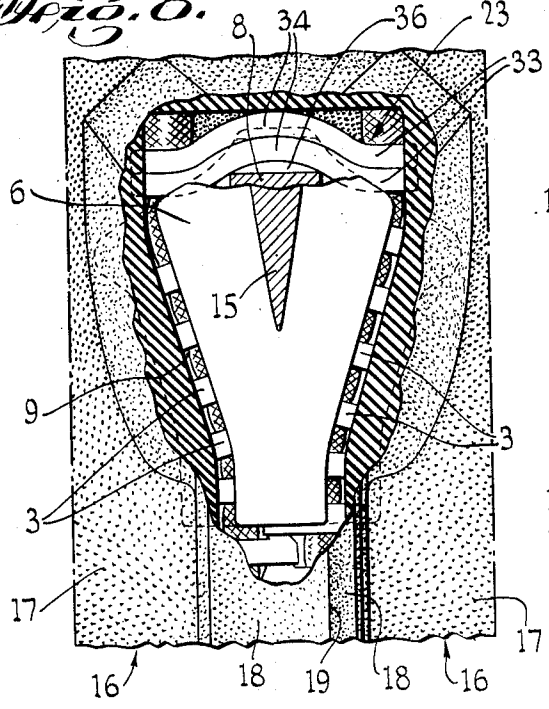
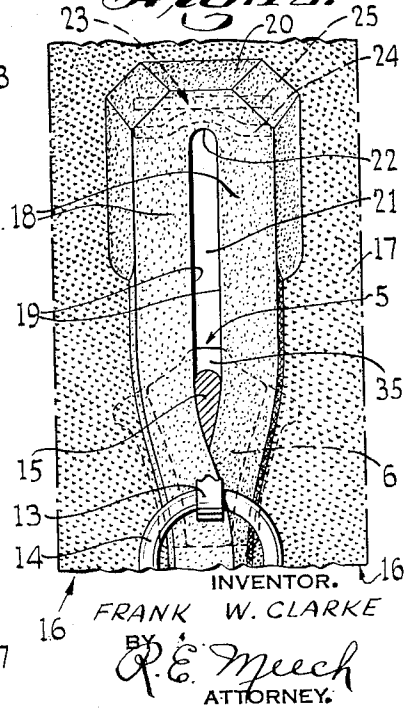


Fig. 12.



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UNITED STATES PATENT OFFICE

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END STOP FOR SLIDE FASTENERS

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Application March 23, 1946, Serial No. 656,691

6 Claims. (Cl. 24—205.11)

1

This invention relates to slide fasteners and, particularly, to an arrangement for interengaging the bridge top top of such fasteners with the slider thereof so as to prevent any relative hinging movement.

In the application of slide fasteners to slits and other closure openings, such as closures in aviation suits and the like, where it is desirable that both ends of the closure opening be closed, a common connection is often provided between the upper ends of the stringer tapes by means of an end member, commonly known as a bridge top stop. Generally, such a bridge top stop consists of a unitary piece of metal which extends between the stringer tape edges. Some of these stops are shaped to conform to the upper end of the slider so that the upper end of the slider and top stop nest together when the slider is disposed in its closed position.

While a conventional top stop arrangement is satisfactory for ordinary closed slits, such as a garment placket, it has been found to be unsatisfactory for such closed end slits wherein a flexible sealing means is used in conjunction with the fastener for sealing the fastener and closure opening against leakage, such as illustrated in the patent to Krupp, No. 2,385,816, dated October 2, 1945. In such a sealing closure, there is provided a pair of rubber-like tapered flexible portions which overlap each other and overlie the fastener elements to form an effective sealing means. These flexible portions are disposed around the lug portion of the slider to which the pull member is attached for manipulating the slider. This lug acts as a plough when the slider is moved in a direction to open the fastener so as to prevent these flexible portions from binding on the slider. When the slider is disposed in its fully closed position at the end of the closure opening, the flexible edge portions of the sealing means fit snugly around the slider lug with the lug extending therebetween.

In order to obtain a sealing effect throughout the entire length of the closure, it is just as important that the sealing means act effectively to seal the fastener at the top or closed end as at any other portion thereof, otherwise, the effectiveness of the sealing means is lost. Herebefore, in the use of a conventional bridge top stop arrangement with such a sealing closure, the flexible portion of the sealing means in the vicinity of the slider, especially around the lug thereof, would tend to gap open when the fastener was flexed in this vicinity when the slider was disposed in its fully closed position thereby permitting leakage between the flexible lips around the slider and lug thereof. This was due primarily to the fact that the bridge top stop and slider were permitted to hinge relative to each other when the fastener was flexed at the upper end of the closure, and it is to an improved bridge top stop and slider arrangement that prevents such hinging that the present invention relates.

2

Accordingly, it is the general object of this invention to provide a means for preventing the bridge top stop and slider from hinging relative to each other when the fastener is closed so as to prevent the sealing means from gapping open in the vicinity of the slider.

It is a more specific object of the present invention to provide a bridge top stop which engages with means carried by the slider so as to prevent any hinging movement of the stop and slider relative to each other when the slider is disposed in its fully closed position.

It is another object of the invention to provide a bridge top stop construction which will prevent any longitudinal movement of the stringer tape edges to which the stop is attached relative to each other and, at the same time, engages the slider so as to prevent any hinging movement of the stop relative to the slider when the slider is disposed in its fully closed position.

It is a further object of this invention to provide a bridge top stop which will hold the stringer tape edges in a slightly spaced relation so as to prevent sticking or jamming of the slider at the end of the opening and which, at the same time, cooperates with the slider to prevent hinging of the stop relative to the slider.

It is still another object of my invention to provide a bridge top stop which is shaped to conform substantially to the upper end of the slider and, at the same time, one which cooperates with the slider to prevent effectively hinging of the stop relative to the slider.

Various other objects and advantages of this invention will be more apparent in the course of the following specification, and will be particularly pointed out in the appended claims.

In the accompanying drawings, there is shown for the purpose of illustration, an embodiment and several modifications thereof which my invention may assume in practice.

In these drawings:

Fig. 1 is a rear view, partly in section, of the end of a slide fastener with which my improved bridge top stop and slider arrangement is incorporated, showing the slider in closed position;

Fig. 2 is a front view of the fastener, as shown

in Fig. 1, with the lug portion of the slider partly broken away so as to show the sealing means around the lug connection;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2;

Fig. 5 is a sectional view taken on line 5—5 of Fig. 4;

Fig. 6 is a rear view, partly in section, of the end of a slide fastener, similar to Fig. 1, showing a modified form of bridge top stop used in connection with the present invention;

Fig. 7 is a sectional view taken on line 7—7 of Fig. 6;

Fig. 8 is a rear view, partly in section, of the end of a slide fastener, similar to Figs. 1 and 6, showing another modified form of bridge top stop which may be used in connection with my invention;

Fig. 9 is a plan view of one part of the bridge top stop;

Fig. 10 is a side view of the stop shown in Fig. 9;

Fig. 11 is a side view of the other part of the bridge top stop; and

Fig. 12 is a front view of the fastener, partly in section, with the slider disposed in a partly open position showing the preferred form of stop incorporated therewith, as shown in Fig. 1.

Referring more particularly to the drawings, my invention is shown incorporated with a conventional type slide fastener consisting, generally, of a pair of stringer tapes 2, having a series of spaced-apart interlocking fastener elements 3 attached to the opposed beaded edges 4 thereof. There is mounted on the fastener elements for longitudinal movement therealong, a slider generally designated at 5, which is adapted to be moved in opposite directions to open and close the fastener in a well-known manner.

The slider shown comprises spaced upper and lower wing portions 6 and 7, respectively, interconnected at one end by a wedge or V-shaped neck portion 8 so as to provide an interior Y-shaped channel 9 having a pair of diverging outlets 10 spaced apart laterally by the neck portion 8. These outlets 10 of the channel serve as exits for the fastener elements 3 when the slider is moved in the direction to open the fastener. When the slider is at the end of the opening in its closed position, as shown in Fig. 1, the beaded edges 4 are spaced rather widely apart, necessarily the same as the exit outlets 10 of the slider channel. There is carried by the lower wing portion 6, a pair of inwardly extending marginal flanges 12 which cooperate with the outer ends of the fastener elements 3 on the inner side of the fastener for guiding the elements into and through the slider channel. The upper wing portion 5 is relatively small and substantially flat and there is carried thereby, a longitudinally extending lug 13 to which there is pivotally attached a pull member 14 for manipulating the slider. The lug 13 at one end is attached to the upper end of the upper wing by means of a substantially wedge-shaped portion 15 with the lower portion of the lug being spaced a slight distance above the upper wing, as clearly shown in Figs. 4 and 7 of the drawings.

There is provided a means for sealing the closure opening and the slide fastener against leakage similar to the sealing closure disclosed in the aforementioned Krupp patent. Such a sealing means comprises a pair of flexible members

16 made of any suitable material but preferably rubber. The body portions 17 of the members 16 are secured to the stringer tapes 2 by any suitable means, such as rubber cement or other suitable adhesive means, but these flexible members are preferably molded or vulcanized integrally with the stringer tapes. Each of the opposed marginal portions 18 of the flexible members 16 are resilient and offset from the body portions 17 and extend over the fastener elements 3 and are spaced a slight distance thereabove and taper to an edge, as at 19. These marginal portions 18 are adapted in one position to overlap each other so as to provide a lip-action sealing means, as clearly shown in Fig. 3.

The ends of the flexible members 16 are joined integrally, as at 20, at the end of the opening adjacent the end of the fastener so as to provide normally a slit 21 therebetween, as shown in Fig. 12. This slit terminates in a flexible tapered U-shaped end, as at 22, so as to provide substantially a lipped edge at the end of the slit.

The marginal portions 18 not only overlie the fastener elements 3, but also the upper wing portion 6 of the slider, and are disposed in under the lug portion 13 carried thereby. The edges 19 of these marginal portions fit snugly around the wedge-shaped lug connecting portion 15 and when the slider is disposed in its fully closed position, as shown in Figs. 2, 4, and 7, the U-shaped end 22 of the slit 21 fits snugly around the upper end of the wedge-shaped portion 15 so as to seal the closure securely around the slider. When the slider is manipulated to open the fastener, as shown in Fig. 12, it will be seen that wedge-shaped portion 15 acts in a plough-like manner to move the marginal portions 18 of the flexible members 16 out of their overlapping position. Due to the fact that the marginal portions 18 are made of a resilient material, such as rubber, it will be seen that the edges 19 thereof bear forcibly against this wedge-shaped portion 15 continuously throughout the travel of the slider along the fastener. These marginal portions are urged normally, due to the inherent resiliency thereof, to position overlying the fastener elements 3 of the respective stringers, as shown in Fig. 3. Accordingly, when the slider is moved in the direction to close the fastener, the wedge-shaped portion 15 will permit the marginal portions 18 to move to their normal position; i. e., overlying the fastener elements in overlapped position so as to provide an effective sealing means. It will be seen that the upper wing portion 6 of the slider is disposed in the space between the marginal portions 15 and the upper side of the fastener elements 3 throughout the movement of the slider along the fastener.

When the slider 5 is disposed in its fully closed position, as shown in Fig. 2, as hereinbefore mentioned, the upper end of the wedge-shaped portion 15 fits snugly into the flexible U-shaped lipped end 22 of the slit 21. While these marginal portions 18, together with the lipped end 22, effectively seal the slit and fastener when the fastener lies flat, it will be seen that the lipped end 22 of the slit and the marginal portions 18 will tend to be displaced from position around the wedge-shaped portion 15 when the fastener and the material around the end of the slit is sharply flexed at a point immediately above the slider. This displacement of these portions will consequently permit leakage around this wedge-shaped portion 15, thereby defeating the sealing effect of the sealing means.

In order to overcome this defect and in accordance with the present invention, there is provided a bridge top stop generally designated at 23, consisting preferably of two separate rigid members 24 and 25 of substantially the same length. Both of these members have a thickness in a plane perpendicular to the stringer tapes 2 substantially equal to that of the fastener elements 3 taken in the same plane. In the preferred form of my invention, as shown in Fig. 1, the inner or lower member 24 has a central portion 26 arcuated so as to conform to the upper end of the slider 5 with which it cooperates in a manner to be described.

This central portion terminates in horizontally extending and substantially parallel end portions 27 which are bifurcated, as at 28, as shown in Figs. 9 and 11, so as to provide a pair of jaw portions 29 on each end for clamping the member to the beaded edges 4 of the stringer tapes 2. The member 24 extends between the opposed beaded edges 4 of the stringer tapes with the bifurcated ends thereof securely clamped thereto at a point a slight distance beyond the endmost fastener elements 3 carried by the stringers. This member 24 is of such length that the jaw or clamping portions on the opposed ends thereof are spaced apart a distance substantially equal to the spacing between the outlets 10 of the slider channel. That is, the arcuated central portion 26 holds the endmost opposed series of fastener elements in spaced relation so as to prevent these elements from sticking or binding on the flanges and the neck portion of the slider when it is moved to its fully closed position. It will be seen that the upper end of the slider nests in the arcuated central portion 26 of the member 24 when in such closed position.

Above or beyond the member 24, there is arranged the member 25 which is preferably flat and straight. This member is similar to the member 24 in that it has bifurcated ends, as at 30, as shown in Figs. 9 and 10, so as to provide jaw portions 31 at each end for clamping this member to the stringer tapes. This member is positioned directly next to the member 24 with the central portion thereof contacting the arcuated central portion 26 of the member 25 and with the clamping or jaw portions thereof secured to the beaded edges 4 of the opposed stringer tape at a spaced distance therefrom. By providing such an arrangement, it will be seen that any longitudinal movement of the opposed beaded edges 4 of the stringer tapes 2 relative to each other will be reduced to a minimum.

In Figs. 6 and 7, there is shown a slight modification of the bridge top stop arrangement of my invention. In this construction the stop consists of a pair of identical rigid members 32, each being of the same design as the member 25 of the preferred form. Both of these members, when clamped to the opposed beaded edges of the stringer tapes, lie directly next to each other throughout their entire length.

In Fig. 8, there is shown another modification of my bridge top stop arrangement. In this construction, there is also provided a pair of rigid identical members 33 with each being of the same design as the member 24 in the preferred construction. These members likewise lie directly next to each other throughout their entire length when clamped to the opposed beaded edges of the stringer tapes with the arcuated central portions 34 nesting in each other and conforming to the upper end of the slider.

Also, according to the present invention, there is carried by the upper end of the slider 5 centrally and adjacent the neck portion 8 thereof, a pair of spaced-apart, substantially parallel, outwardly projecting portions 35 so as to provide a laterally extending or transverse rectangular-shaped open-ended slot or recess 36 in the upper end of the slider. The distance between the spaced-apart portions 35 is slightly greater than the thickness through the stop 23 in a plane perpendicular to the plane of the stringer tapes, as is clearly shown in Figs. 4 and 5, or, the width of the slot 36 is equal substantially to the height of the Y-shaped slider channel 9. The length of this slot is substantially equal to the widest width of the neck portion 8 of the slider. This slot is in alignment with the bridge top stop 23 with which it cooperates in a manner and for a purpose now to be explained.

The slot 30 is provided to house both of the members 24 and 25 of the bridge stop 23 when the slider is moved to its fully closed position at the end of the slit 21; i. e., the projecting portions 35 straddle the stop 23, as shown in Fig. 4. In other words, the bridge top stop 23 and the slot 36 of the slider engage each other so as to provide substantially a key and slot arrangement. By providing such a construction, it will be seen that any pivotal or hinging movement of the stop relative to slider at the closed end of the fastener is prevented due to the fact that the dimensions of the slot and stop are relatively close and that the slider and stop are substantially keyed together when the slider is disposed in such closed position. In view of the fact that the stop and slider are prevented from any relative hinging movement, it necessarily follows that the flexible portions of the sealing means in the vicinity of the stop will not move relative to the upper end of the slider when the closure opening or fastener is flexed in this vicinity. Consequently, the U-shaped lipped end 22 and the marginal portions 18 adjacent thereto will be maintained securely around the wedge-shaped lug connecting portion 15 even though the upper end of the fastener might be bent or flexed, thereby maintaining a seal at all times in the vicinity of the slider regardless of the conditions to which the fastener is subjected. When the slider is manipulated to open the fastener, it will be seen that the bridge stop 23 passes freely out of the open side of the slot 36 thereby permitting free movement of the slider in a direction to open the fastener.

As a result of my invention, it will be seen that there is provided a simple and inexpensive arrangement for preventing any hinging movement of a bridge top stop relative to the slider when the closure or fastener is flexed in the vicinity of the upper end of the fastener which may be conveniently and efficiently incorporated with any type sealing means. The bridge top stop is of such construction that it can be attached to the fastener at the time of the manufacture thereof by the slide fastener manufacturer, and lends itself to cementing or vulcanization in the article or closure with which it is to be used without the need of any special equipment.

While I have shown and described several embodiments which my invention may assume in practice, it will be understood that these embodiments are merely for the purpose of illustration and description, and that other forms may be devised within the scope of my invention as defined in the appended claims.

What I claim as my invention is:

1. In combination, a series of interlocking fastener elements arranged along the opposed edges of a pair of stringer tapes, a slider movable longitudinally of said elements for engaging and disengaging the same, said slider comprising a pair of spaced-apart wing portions connected together at one end by a neck portion so as to define an interior substantially Y-shaped channel, a bridge top stop extending between the opposed edges of said stringer tapes at a point beyond the endmost fastener elements, said stop having means arranged at each end thereof for attaching the same to the opposed edges of said stringer tapes, and means carried by said slider engaging said top stop so as to prevent any hinging movement of said top stop relative to said slider consisting of a pair of spaced-apart substantially parallel portions extending forwardly of the slider adjacent the neck portion thereof so as to define a transverse slot therebetween in which the stop is disposed when the slider is moved to its fully closed position with the extending portions straddling said stop.

2. In combination, a series of interlocking fastener elements attached to the opposed edges of a pair of stringer tapes, a slider movable longitudinally of said elements for engaging and disengaging the same, said slider comprising a pair of spaced-apart wing portions connected together at one end by a neck portion so as to define an interior substantially Y-shaped channel, a bridge top stop comprising a rigid piece of material extending between the opposed edges of the stringer tapes at a point beyond the endmost fastener elements, said stop having jaws arranged on each end thereof for attaching the stop to the opposed stringer tape edges whereby said edges are held securely in spaced relation, means carried by said slider engaging said stop so as to prevent any hinging movement of said stop relative to said slider consisting of a transverse slot arranged in the neck portion at the upper end of the slider in which slot the stop is seated and keyed when the slider is disposed in its fully closed position.

3. In combination, a series of interlocking fastener elements arranged along the opposed edges of material bordering an opening, a slider movable longitudinally of said elements for engaging and disengaging the same, a top stop bridging the end of the opening for limitng the closing movement of said slider, means for sealing the opposed edges of said opening comprising a pair of flexible portions overlying said fastener elements and said top stop, and means carried by said slider engaging said stop when the slider is moved to its fully closed position so as to prevent any hinging movement of said stop relative to said slider when the opening is flexed in the vicinity of said stop thereby preventing the flexible portions of said sealing means from becoming displaced from their sealing position on said fastener elements, said engaging means consisting of a transverse slot arranged in the neck portion at the upper end of the slider in which slot the stop is firmly seated and keyed when the slider is disposed in its fully closed position.

4. In combination, a series of interlocking fastener elements attached to the opposed edges of a pair of stringer tapes, a slider movable longitudinally of said elements for engaging and disengaging the same, said slider comprising a pair of spaced-apart wing portions connected together at one end by a neck portion so as to define an interior substantially Y-shaped channel, a bridge top stop extending between the opposed edges of

said stringer tapes at a point beyond the endmost fastener elements thereof, said bridge top stop consisting of a rigid piece of bar-like material having a jaw-like portion arranged on each end thereof for attaching the same to the opposed stringer tape edges, means attached to said stringers for sealing the space between the opposed edges thereof comprising a pair of flexible portions overlying said fastener elements and said top stop, and means carried by the slider adjacent the neck portion thereof which engages said stop when the slider is moved to its fully closed position so as to prevent any hinging movement of said stop relative to said slider when the stringers are flexed in the vicinity of said stop thereby preventing the flexible portions of said sealing means from becoming displaced from their sealing position on said fastener elements around said slider, said engaging means consisting of a transverse slot arranged in the neck portion at the upper end of the slider in which the stop is firmly seated and keyed when the slider is disposed in its fully closed position.

5. In combination, a series of interlocking fastener elements attached to the opposed edges of a pair of stringer tapes, a slider movable longitudinally of said elements for engaging and disengaging the same, a bridge top stop extending between the opposed edges of said stringer tapes at a point beyond the endmost fastener elements comprising a rigid member having an arcuated central portion and a substantially straight end portion arranged to each side thereof, each of said end portions being bifurcated so as to provide clamping jaws for attaching the member to the opposed stringer tape edges, and means carried by said slider engaging the arcuated central portion of said member so as to prevent any hinging movement of said stop relative to said slider when the latter is moved to its fully closed position against said stop, said engaging means consisting of a transverse slot arranged in the neck portion at the upper end of the slider in which slot the arcuated central portion of said stop is firmly seated and keyed when the slider is disposed in its fully closed position thereagainst.

6. In combination, a series of interlocking fastener elements attached to the opposed edges of a pair of stringer tapes, a slider movable longitudinally of said elements for engaging and disengaging the same, a lug connected to said slider to which a pull member is adapted to be attached, a bridge top stop extending between the opposed edges of said stringer tapes at a point beyond the endmost fastener elements thereof, said stop having clamping portions arranged on each end thereof for attaching the stop to the opposed stringer tape edges, a pair of flexible members overlying said stringers and said fastener elements which members cooperate with each other to provide a seal for said fastener, said flexible members being integrally connected at one end so as to form a flexible lip portion which fits snugly around the upper portion of the connection of said lug with said slider when the slider is disposed in its fully closed position so as to seal the space around said lug connection against leakage, and means carried by the said slider engaging said stop when the slider is moved to its closed position thereagainst so as to prevent any hinging movement of said stop relative to slider when the stringers are flexed in the vicinity of said stop thereby preventing the flexible end lip portion of said flexible members from being displaced from position around said lug connection,

said engaging means consisting of a transverse slot arranged in the neck portion at the upper end of the slider in which slot the stop is firmly seated and keyed when the slider is disposed in its fully closed position.

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