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(54) SLIDER FOR CONCEALED SLIDING CLASP FASTENERS

(71) We, YOSHIDA KOGYO K. K., a Corporation duly organized under the laws of Japan and existing at No. 1, Kanda Izumi-cho, Chiyoda-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates generally to sliding clasp fasteners, and more specifically to a sliding clasp fastener of the concealed type wherein the fastener elements are completely hidden under the stringer tapes when the sliding clasp fastener is closed thereon. Even more specifically, the invention is directed to the improved configuration of a slider for use with such concealed sliding clasp fasteners.

As is well known, the rows of interlocking fastener elements of a concealed sliding clasp fastener are usually affixed to folded portions along the opposed longitudinal edges of a pair of stringer tapes, respectively. These concealed sliding clasp fastener stringers, moreover, are secured to respective folds set inwardly along the edges defining a desired closure opening in an article, so that the slider is required to travel under at least three superposed layers of cloth or the like in the act of coupling or uncoupling the stringers. As later referred to in connection with the accompanying drawings, there are cases where the concealed sliding clasp fastener thus attached to the article is arranged across a seam joining two pieces of cloth of that article. The slider of the concealed sliding clasp fastener is then required to travel under an unduly thick region consisting of at least seven superposed layers.

If the concealed sliding clasp fastener is mounted along a curved path on the article, or if cross-wise pulling forces are exerted which tend to urge the fastener stringers away from each other, then the folded portions of, in particular, the aforesaid thick region rise away from the general

plane of the article and turn toward the slider travelling along the rows of fastener elements.

As heretofore constructed, the slider for use with the concealed sliding clasp fasteners under consideration has a flared front end and a contracted rear end, the flared front end being of course significantly greater in width than the contracted rear end. The folded portions of the thick region that have risen away from the article plane as above stated are forced against the flared front end of the slider from both lateral sides thereof, thereby offering substantial frictional resistance to the movement of the slider along the fastener elements as can be seen from Figure 8. This has been the principal reason why the prior art slider cannot be pulled smoothly under the thick region that often exists in the article to which the concealed sliding clasp fastener is attached.

According to the invention, there is provided a concealed slide fastener comprising a slider having a body having a front end and a rear end, a separator mounted centrally at said front end of said body, and a generally Y-shaped guide channel formed by said separator in combination with a pair of flanges formed along parts of the respective marginal edges of said body and a pair of lips extending inwardly from the tops of the respective flanges, for guiding therethrough the rows of interlocking fastener elements of the concealed slide fastener to couple or uncouple the same, the slider body having a generally flat bottom plate, a front end portion of said plate having a portion which is defined by a pair of generally parallel spaced-apart lateral edges, and of which the width is the maximum width of said front end portion of said plate, the spacing of said lateral edges being substantially equal to the sum of the width of said separator and the combined widths of the respective rows of fastener elements to be guided through said guide channel, said maximum width portion extending forwardly beyond

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said flanges and lips to receive and guide said rows of fastener elements toward said guide channel.

5 The invention will be described by way of examples with reference to the accompanying drawings which illustrate, by way of example only, some preferred embodiments of the invention and wherein like reference characters denote corresponding parts of the several views, and wherein:

10 Figure 1 is a perspective view of a slider for concealed sliding clasp fasteners which is constructed in accordance with this invention;

15 Figure 2 is a sectional view taken along a plane parallel to the bottom wall of the slider shown in Figure 1, the view also showing rows of interlocking fastener elements of a concealed sliding clasp fastener for use with the slider in order to clearly reveal the dimensional relationship between the front end portion of the slider body and the fastener elements;

20 Figure 3 is a top plan view of a slider constructed by way of another preferred embodiment of the invention, the slider being shown with its pull tab and connector ring omitted;

25 Figure 4 is a rear perspective view showing a pair of stringers of the concealed sliding clasp fastener as attached to an articles having a seam arranged across the stringers;

30 Figure 5 is a rear plan view explanatory of the rising of the folded portions of the concealed sliding clasp fastener of Figure 4 as a result of lateral pulling forces exerted on the article from both sides of the fastener, the view also showing the slider of Figures 1 and 2;

35 Figure 6 is a sectional view taken along the plane of line VI—VI in Figure 5 and looking in the direction of the arrows;

40 Figure 7 is also a sectional view taken along the plane of line VII—VII in Figure 5 and looking in the direction of the arrows; and

45 Figure 8 is a further sectional view taken along the plane of line VI—VI in Figure 5 and looking in the direction of the arrows, but showing a conventional slider being used.

50 The slider 10 illustrated in Figures 1 and 2 includes a body 11 having a front end 12 and a rear end 13. The slider body 11 is composed essentially of a bottom wall or plate 14 and a pair of flanges 15 formed along parts of the respective marginal edges of the bottom wall. A pair of lips 16 extend inwardly from the tops of the respective flanges 15 in bilaterally symmetrical arrangement with respect to the longitudinal axis of the slider body. An island or separator 17 is fixedly mounted on

the bottom wall 14 in a central position at the front end thereof. As may now be apparent, a substantially Y-shaped guide channel is formed through the slider body 11 for guiding therethrough the rows of fastener elements 18 of a concealed sliding clasp fastener in the act of coupling or uncoupling the same in the usual manner. A pawl 19 is connected to the separator 17 as by a pin 20, and a pull tab 21 is coupled to the slider body via a connector ring 22 loosely surrounding the pawl 19.

As shown in Figure 2, the maximum width of the front end 12 of the slider body 11 is made substantially equal to the sum of the width of the separator 17 and the combined widths of the respective rows of fastener elements 18 to be guided through the guide channel of the slider 10.

It will appear from a consideration of Figure 2 that no substantial difference in transverse dimension exists between the front end 12 and rear end 13 of the slider body 11. If desired, the transverse dimension of the slider body 11 can be made exactly the same in the longitudinal direction thereof, as clearly shown in Figure 3.

Figure 4 illustrates the pair of stringers of the concealed sliding clasp fastener as attached to an article 23 in cross-wise arrangement with its thick region 24 previously mentioned in connection with the description of the prior art. When lateral pulling forces are exerted on this article 23 from both sides of the concealed sliding clasp fastener, as indicated by the arrows in Figure 5, the folded portions 25 of the thick region 24 rise away from the general plane of the article 23 and turn toward the slider 10 travelling along the rows of fastener elements 18.

However, since the width of the front end 12 of the slider body 11 is literally minimized as above explained, the raised folded portions 25 of the thick region 24 present no serious obstacle against the movement of the slider 10 along the rows of fastener elements 18, as will be seen from the cross-sectional views given in Figures 6 and 7. The slider 10 can therefore be pulled smoothly along the elements 18 of the concealed sliding clasp fastener, only with minimum frictional resistance exerted by the folded portions 25.

WHAT WE CLAIM IS:—

1. A concealed slide fastener comprising a slider having a body having a front end and a rear end, a separator mounted centrally at said front end of said body, and a generally Y-shaped guide channel formed by said separator in combination with a pair of flanges formed along parts of the respective marginal edges of said body and

said flanges and lips to receive and guide said rows of fastener elements toward said guide channel.

The invention will be described by way of examples with reference to the accompanying drawings which illustrate, by way of example only, some preferred embodiments of the invention and wherein like reference characters denote corresponding parts of the several views, and wherein:

Figure 1 is a perspective view of a slider for concealed sliding clasp fasteners which is constructed in accordance with this invention;

Figure 2 is a sectional view taken along a plane parallel to the bottom wall of the slider shown in Figure 1, the view also showing rows of interlocking fastener elements of a concealed sliding clasp fastener for use with the slider in order to clearly reveal the dimensional relationship between the front end portion of the slider body and the fastener elements;

Figure 3 is a top plan view of a slider constructed by way of another preferred embodiment of the invention, the slider being shown with its pull tab and connector ring omitted;

Figure 4 is a rear perspective view showing a pair of stringers of the concealed sliding clasp fastener as attached to an article having a seam arranged across the stringers;

Figure 5 is a rear plan view explanatory of the rising of the folded portions of the concealed sliding clasp fastener of Figure 4 as a result of lateral pulling forces exerted on the article from both sides of the fastener, the view also showing the slider of Figures 1 and 2;

Figure 6 is a sectional view taken along the plane of line VI—VI in Figure 5 and looking in the direction of the arrows;

Figure 7 is also a sectional view taken along the plane of line VII—VII in Figure 5 and looking in the direction of the arrows; and

Figure 8 is a further sectional view taken along the plane of line VI—VI in Figure 5 and looking in the direction of the arrows, but showing a conventional slider being used.

The slider 10 illustrated in Figures 1 and 2 includes a body 11 having a front end 12 and a rear end 13. The slider body 11 is composed essentially of a bottom wall or plate 14 and a pair of flanges 15 formed along parts of the respective marginal edges of the bottom wall. A pair of lips 16 extend inwardly from the tops of the respective flanges 15 in bilaterally symmetrical arrangement with respect to the longitudinal axis of the slider body. An island or separator 17 is fixedly mounted on

the bottom wall 14 in a central position at the front end thereof. As may now be apparent, a substantially Y-shaped guide channel is formed through the slider body 11 for guiding therethrough the rows of fastener elements 18 of a concealed sliding clasp fastener in the act of coupling or uncoupling the same in the usual manner. A pawl 19 is connected to the separator 17 as by a pin 20, and a pull tab 21 is coupled to the slider body via a connector ring 22 loosely surrounding the pawl 19.

As shown in Figure 2, the maximum width of the front end 12 of the slider body 11 is made substantially equal to the sum of the width of the separator 17 and the combined widths of the respective rows of fastener elements 18 to be guided through the guide channel of the slider 10.

It will appear from a consideration of Figure 2 that no substantial difference in transverse dimension exists between the front end 12 and rear end 13 of the slider body 11. If desired, the transverse dimension of the slider body 11 can be made exactly the same in the longitudinal direction thereof, as clearly shown in Figure 3.

Figure 4 illustrates the pair of stringers of the concealed sliding clasp fastener as attached to an article 23 in cross-wise arrangement with its thick region 24 previously mentioned in connection with the description of the prior art. When lateral pulling forces are exerted on this article 23 from both sides of the concealed sliding clasp fastener, as indicated by the arrows in Figure 5, the folded portions 25 of the thick region 24 rise away from the general plane of the article 23 and turn toward the slider 10 travelling along the rows of fastener elements 18.

However, since the width of the front end 12 of the slider body 11 is literally minimized as above explained, the raised folded portions 25 of the thick region 24 present no serious obstacle against the movement of the slider 10 along the rows of fastener elements 18, as will be seen from the cross-sectional views given in Figures 6 and 7. The slider 10 can therefore be pulled smoothly along the elements 18 of the concealed sliding clasp fastener, only with minimum frictional resistance exerted by the folded portions 25.

WHAT WE CLAIM IS:—

1. A concealed slide fastener comprising a slider having a body having a front end and a rear end, a separator mounted centrally at said front end of said body, and a generally Y-shaped guide channel formed by said separator in combination with a pair of flanges formed along parts of the respective marginal edges of said body and





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5 a pair of lips extending inwardly from the
10 tops of the respective flanges, for guiding
15 therethrough the rows of interlocking
fastener elements of the concealed slide
fastener to couple or uncouple the same,
the slider body having a generally flat
bottom plate, a front end portion of said
plate having a portion which is defined by a
pair of generally parallel spaced-apart
lateral edges, and of which the width is the
maximum width of said front end portion of
said plate, the spacing of said lateral edges
being substantially equal to the sum of the
width of said separator and the combined
widths of the respective rows of fasteners
elements to be guided through said guide

channel, said maximum width portion
extending forwardly beyond said flanges
and lips to receive and guide said rows of
fastener elements toward said guide
channel.

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2. A sliding clasp fastener as claimed in
Claim 1, wherein the maximum width of
said front end of said body is equal to the
width of said rear end thereof.

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3. A sliding clasp fastener substantially as
herein described with reference to and as
illustrated in the accompanying drawings.

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