

PATENT SPECIFICATION (11)

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(54) SLIDERS FOR SLIDING CLASP FASTENER

(71) We, YOSHIDA KOGYO K.K., a corporation duly organized under the laws of Japan and existing at No. 1, Kanda Izumicho, 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:—

10 This invention relates to sliders for sliding clasp fasteners and, more particularly, to such a slider which comprises a slider body, a pull tab and a yoke.

15 In the assembling of these slider components there have heretofore been known two typical methods of attaching the yoke to the slider body. One such method is to bring the yoke into snapping engagement with a bail or lug projecting upwardly from the slider body. The other method is to rivet the front and rear end walls and/or the side walls of the yoke into the bail. The first-mentioned method of slider assembly suffers from the drawback that the yoke is susceptible to disengagement from the slider body. The riveting operation in the second-mentioned method is rather time-consuming and tedious and often involves off-specification products due to machining errors. Another difficulty with the latter method is that this method is unsuitable for processing large-size sliders having their pull tabs normally subjected to a relatively large pulling force during the manipulation of the slider.

25 According to the invention, there is provided, a slider for a sliding clasp fastener comprising:

30 a slider body including an upper shield and a lower shield and having a front and a rear end, said shields being connected together by a neck portion at the front end, said upper shield having a plurality of grooves therein extending longitudinally of the slider body, a pull tab having at one end a pintle pivotally connected to said upper shield; a pair of first engaging means provided at the front and rear ends, respectively, of said upper shield; a yoke mounted on said upper shield and having an upper

portion, a pair of longitudinal side walls and a pair of front and rear end walls, said side walls having cut-away recesses through which said pintle extends and providing separated bottom edges engageable in said grooves; and a pair of second engaging means provided at the front and rear end walls, respectively, of said yoke and inter-fitting with said first engaging means, said yoke and upper shield being fused together along their respective engaging surfaces to provide an integral joint.

The invention will be described by way of examples with reference to the accompanying drawings in which preferred embodiments of the present invention are shown. In the drawings:—

Figure 1 is an exploded perspective view, with parts cut away, of a slider constructed in accordance with the invention;

Figure 2 is a fragmentary, transverse cross-sectional view of the slider of Figure 1 taken when the same has been assembled, in a plane through a rear projection extending upwardly from the upper shield; and

Figure 3 is a view similar to Figure 1 but showing another embodiment of the invention.

Figure 1 shows a slider of the automatically locking type generally designated at 10 and essentially comprising a slider body 11, a pull tab 12 and a yoke 13. The slider body 11 has an upper shield 14 and a lower shield 15 connected together at their front ends in spaced opposed relation by an integral neck portion 16 (Figure 2) to provide a substantially Y-shaped guide channel 17 for the passage therein of a pair of rows of fastener elements (not shown). A pair of flanges 18 extend downwardly from the upper shield 14 and a pair of flanges 19 extend upwardly from the lower shield 15, these flanges 18, 19 serving to retain the fastener elements in the Y-shaped guide channel 17 during longitudinal movement of the slider 10 along the rows of interlocking fastener elements (not shown) to open or close the sliding clasp fastener in the well known manner.

The pull tab 12 is generally rectangular

in shape and is apertured at 20 to provide at one end a transversely extending pintle 21 which functions as an axis for the pivotal movement of the pull tab 12.

5 The yoke 13 has the shape of an elongated hollow cap and has an upper portion 22 and two longitudinal side walls 23 directed downwardly therefrom. Each side wall 23 is provided at or near its center with a recess 24 extending upwards from the bottom edge of the respective side wall. The yoke 13 thus provides a pair of front bottom flange edges 25 and a pair of rear bottom flange edges 26, each edge 26 having at its front end a stepped portion 27 for reasons described later.

Front and rear end walls 28, 29 have formed therein cutaway recesses 30, 31, respectively. A pair of transversely opposed ridges 32 project from the side walls 23 into the front recess 30. Similarly, a pair of transversely opposed ridges 33 project from the side walls 23 into the rear recess 31. The front ridges 32 have engaging top surfaces 34 sloping downwardly towards the rear end of the yoke and the rear ridges 33 have similar engaging top surfaces 35 sloping downwardly towards the yoke rear end.

30 The upper shield 14 has a pair of spaced front grooves or indents 36 and a pair of spaced rear grooves or indents 37, these grooves being formed in the upper shield 14 and extending longitudinally of the slider body 11. The front and rear grooves 36, 37 are so dimensioned as to fit with the front and rear bottom edges 25, 26, respectively, of the yoke 13.

40 A pair of substantially T-shaped, front and rear projections 38, 39 respectively extend upwardly from the front and rear ends 40, 41 of the upper shield 14, and have lateral flanges 42, 43 providing engaging undersurfaces 44, 45, respectively, and are adapted to fit in the cut-away recesses 30, 31, respectively. The undersurfaces 44, 45 are sloped downwardly so as to fit snugly with the ridge top surfaces 34 and 35, respectively.

50 A pair of spaced, transversely extending protrusions 46, 47 of triangular cross section are formed on the upper shield 14 and extend intermediate the grooves 36 and 37. The pintle 21 is disposed between the protrusions 46 and 47. A spring member 48 is placed on the upper shield 14 and extends longitudinally across the protrusions 46, 47 and the pintle 21. The spring member 48 has at one end a locking prong 49 directed downwardly therefrom through an aperture 50 in the upper shield 14 and movable into and out of engagement with the fastener elements within the slider body 11.

65 For the assembling of the component members of the slider 10, the pull tab 12

and then the spring member 48 are placed on the upper shield 14. Then, the yoke 13 is placed on the upper shield 14 with the front and rear bottom edges 25, 26 inserted in the front and rear grooves 36, 37, respectively. In this instance, the yoke 13 proper is slightly displaced longitudinally toward the front slider end 40 so as to facilitate the insertion of the bottom edges 25, 26 through the function of the stepped portions 27 which then ride on the front edges of the rear grooves 37. The yoke 13 is slid in and along the grooves 36, 37 toward the slider rear end 41 until the front and rear ridges 32, 33 engage with the lateral flanges 42, 43, respectively, with the top surfaces 34, 35 fully brought into abutment with the undersurfaces 44, 45, respectively.

The yoke 13 is fixed to the upper shield 14 by means of for example ultrasonic welding. More specifically, as shown in Figure 2, the yoke 13 and the upper shield 14 are melted along their respective engaging surfaces and joined together by applying ultrasonic vibrations under pressure to provide an integral joint.

In Figure 3, there is shown a slider 10a constructed according to another embodiment of the invention in which a pair of flanges 50, 51 project from the front and rear walls 28, 29, respectively, into the interior of the cap-like yoke 13a. A pair of cross-sectionally hook-shaped flanges 52, 53 have forwardly and rearwardly opening channels 54, 55, respectively, and project upwardly from the upper shield 14a at the front and rear slider ends 40, 41, respectively, the flanges 52, 53 being adapted to interengage with the flanges 50, 51, respectively. When assembling the yoke 13a onto the slider body 11a, it is pressed against the upper shield 14a until the flanges 50, 51 are snapped into the channels 54, 55, respectively, with the lower edges 25a, 26a of the yoke 13a inserted in the grooves 36a, 37a, respectively. Then, the yoke 13a is fixed to the upper shield 14a by means of ultrasonic welding.

Where the sliders are made out of metal, electric resistance welding or high-frequency induction welding can be used to secure the yoke firmly into position on the slider body. While the embodiments of Figures 1 and 3 illustrate automatically locking sliders, it will be understood that the principles of the present invention may also be applied to non-locking sliders having cap-like yokes.

Advantageously, the yoke 13 (13a) is mounted securely in place on the slider body 11 (11a) by bringing the ridges 34, 35 (Figure 1) or the flanges 50, 51 (Figure 3) into engagement with the projections 38, 39 (Figure 1) or the flanges 52, 53 (Figure 3). The joint between the yoke 13 (13a) and the

slider body 11 (11a) is further strengthened by welding as above stated. During welding operation, the yoke 13 (13a) is held stably in position by the above interfitting parts against accidental displacement which would otherwise be caused by vibrations or other external forces as applied by an ultrasonic horn or other processing devices, or by the biasing force of the spring member 48 disposed within the yoke 13 (13a).

WHAT WE CLAIM IS:—

1. A slider for a sliding clasp fastener comprising:
 - (a) a slider body including an upper shield and a lower shield and having a front and a rear end, said shields being connected together by a neck portion at the front end, said upper shield having a plurality of grooves therein extending longitudinally of the slider body;
 - (b) a pull tab having at one end a pintle pivotally connected to said upper shield;
 - (c) a pair of first engaging means provided at the front and rear ends, respectively, of said upper shield,
 - (d) a yoke mounted on said upper shield and having an upper portion, a pair of longitudinally side walls and a pair of front and rear end walls, said side walls having cut-away recesses through which said pintle extends and providing separated bottom edges engageable in said grooves; and
 - (e) a pair of second engaging means pro-

vided at the front and rear end walls, respectively, of said yoke and interfitting with said first engaging means, said yoke and upper shield being fused together along their respective engaging surfaces to provide an integral joint.

2. A slider according to claim 1 in which said first engaging means are substantially T-shaped projections each having a pair of lateral flanges, and said second engaging means are opposed ridges projecting into cut-away recesses formed in said front and rear end walls of the yoke.

3. A slider according to claim 1 in which said first engaging means are cross-sectionally hook-shaped flanges having forwardly and rearwardly opening channels, and said second engaging means are flanges projecting from said front and rear end walls into the interior of the yoke.

4. A slider according to claim 1 including a spring member disposed within said yoke and having at one end a locking prong directed downwardly through an aperture formed in said upper shield.

5. A slider substantially as herein described with reference to and as illustrated in Figures 1 and 2 or Figure 3 of the accompanying drawings.

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25 at the front and rear ends, respectively, of said upper shield,
(d) a yoke mounted on said upper shield and having an upper portion, a pair of longitudinally side walls and a pair of
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