

PATENT SPECIFICATION (11)

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(54) LOCK SLIDER FOR 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:—

10 This invention relates to sliders for sliding clasp fasteners, and more particularly to improvements in a slider of the type which can be locked against movement in a desired position on rows of interlocking fastener elements upon manual turning of a pull tab to a recumbent position on the slider body, that is, to a plane substantially parallel to the planes of the paired wings or plate members of the slider body.

20 A lock slider has been suggested wherein the pull tab is integrally provided with a locking pawl which, when the pull tab is manually pivoted to the recumbent position, engages and presses the fastener elements against the slider body thereby locking the slider against movement in either direction. Being connected in a cantilever fashion to the pull tab, however, the locking pawl undergoes elastic deformation in engaging the fastener elements as above. The pressure exerted by the conventional locking pawl is therefore insufficient for the positive locking of the slider.

35 As an additional disadvantage, the elastic deformation of the conventional locking pawl inevitably occurs concentratedly at its end connected to the pull tab. In the use of the lock slider, therefore, the locking pawl easily suffers permanent deformation at that end. The amount of this permanent deformation gradually increases until at last the locking pawl becomes incapable of locking the slider.

40 The present invention seeks to overcome the above noted problems of the prior art and to provide an improved lock slider which can be positively locked against movement and which will retain this positive locking function for a greatly extended length of time.

According to the invention, there is provided a slider which can be locked against movement in a desired position on rows of interlocking fastener elements of a sliding clasp fastener, comprising a body having top and bottom wings which are connected at their front ends so as to provide therebetween a Y-shaped guide channel for the fastener elements, there being an aperture in the top wing of the body, a pull tab connected at one end to the top wing of the body for pivotal motion relative to same about a predetermined axis, a locking pawl on said one end of the pull tab intruding into the guide channel in the body through the aperture in its top wing, the locking pawl having a predetermined point of contact with the fastener elements for pressing same against the bottom wing of the body when the pull tab is in a recumbent position on the body, the predetermined contact point of the locking pawl being disposed forwardly of the predetermined axis of the pivotal motion of the pull tab when the latter is in the recumbent position, and an abutment formed on the inside surface of the top wing of the body and disposed forwardly of the aperture therein so as to be abutted upon by a tip of the locking pawl when the pull tab is in the recumbent position, the predetermined contact point of the locking pawl being disposed rearwardly of its tip when the pull tab is in the recumbent position.

The invention will now be described in greater detail, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a perspective view of a lock slider constructed in accordance with the principles of this invention;

Figure 2 is an enlarged, cross-sectional view taken along line II—II of Figure 1; and

Figure 3 is a perspective view, partly broken away, of the pull tab of the lock slider of Figures 1 and 2.

With reference first and in particular to Figure 1 of the above drawings, a preferred form of a lock slider in accordance with this invention is broadly composed of a body 10 and a pull tab 11, with the latter being pivot-

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ally connected to the former. The slider body 10 comprises a pair of flanged top and bottom wings or plate members 12 and 13 which are connected at their front ends, directed toward the left as viewed in Figures 1 and 2, by an integral neck 14 so as to provide therebetween the usual Y-shaped guide channel for rows of interlocking fastener elements indicated at 15 in Figure 2.

10 The top wing 12 of the slider body 10 has formed thereon a pair of inverted U-shaped lugs 16 and 17 which are spaced from each other in the transverse direction of the slider body and which are integrally connected by a connective portion 18. In this particular embodiment, the lugs 16 and 17 together with the connective portion 18 are formed integral with the slider body top wing 12 by punching and embossing the latter. This construction is by way of example only, however, and is subject to a variety of modifications within the scope of the present invention. The slider body top wing 12 has formed therein an aperture 19 which is located between the pair of lugs 16 and 17 and rearwardly of the neck 14.

25 As best illustrated in Figure 3, the pull tab 11 has a pair of opposed L-shaped portions 20 and 21 formed at one end thereof. Parts of these L-shaped portions 20 and 21 are somewhat loosely engaged in the respective lugs 16 and 17 on the slider body 10 so as to permit pivotal motion of the pull tab 11 relative to the body about an axis indicated at 22 in Figure 2.

35 Also formed at said one end of the pull tab 11 is a locking pawl 23 which is substantially J-shaped as seen in a longitudinal section of the pull tab as in Figure 2 and which is located between the pair of L-shaped portions 20 and 21. The locking pawl 23 can partly intrude into the guide channel in the slider body 10 through the aperture 19 in its top wing 12.

40 Figures 1 and 2 show the pull tab 11 in a recumbent position on the slider body 10, with the pull tab extending rearwardly of the slider body and lying in a plane substantially parallel to the planes of the wings 12 and 13. With the pull tab 11 thus maintained in the recumbent position, its locking pawl 23 projects forwardly and downwardly into the guide channel in the slider body 10, making contact at its predetermined point 24 with the interlocking fastener elements 15 for pressing same against the slider body bottom wing 13. The slider is thus locked against movement in either direction on the rows of fastener elements 15.

50 It will be noted from Figure 2 that the predetermined contact point 24 of the locking pawl 23 with the fastener elements 15 is disposed forwardly of the axis 22 of the pivotal motion of the pull tab 11 by a distance D when the pull tab is in the recumbent position on the slider body. It will also be seen that

the locking pawl 23 extends forwardly, when the pull tab 11 is in the recumbent position, beyond its contact point 24 with the fastener elements 15.

55 Seen at 25 in Figure 2 is an abutment formed on the inside surface of the slider body top wing 12 and disposed just forwardly of the aperture 19 therein. The tip 26 of the curved pawl 23 rests against the abutment 25 when the pull tab 11 is in the recumbent position. In the illustrated embodiment, the top wing 12 is reduced in thickness at its portion providing the abutment 25, as by application of pressure or by removal of the material, in order that the pull tab 11 may be smoothly pivoted to and away from the recumbent position in the use of the slider.

60 It is clear from the foregoing that with the pull tab 11 in the recumbent position, the slider is locked as the locking pawl 23 presses the fastener elements 15 against the slider body bottom wing 13 with its tip 26 resting against the abutment 25 and with the L-shaped pull tab portions 20 and 21 resting against the lugs 16 and 17. Desirably, therefore, some measure should be taken to reduce the possibility of deformation of the locking pawl 23 to a minimum. As an example of such measures, the locking pawl of this particular embodiment has a groove 27 formed as by stamping, the groove 27 extending longitudinally therein and terminating short of the pawl tip 26, so that the locking pawl is mostly formed into the shape of a U in cross section for improved strength.

65 The bottom wing 13 of the slider body 10 has formed in its inside surface a depression 28 for partly receiving and engaging the fastener elements 15 as they are pressed by the locking pawl 23. This depression 28 is bounded at its front end by a sloping surface 29 such that the particular fastener elements being pressed by the locking pawl 23 will be stably maintained in the correct attitude.

70 Inevitably, the locking pawl 23 suffers some elastic deformation as same presses the fastener elements 15 against the slider body bottom wing 13 in the above described manner upon pivotal motion of the pull tab 11 to the recumbent position. In spite of the energy thus stored in the locking pawl 23, the pull tab 11 is not to be easily pivoted away from its recumbent position to unlock the slider. This is because the contact point 24 of the locking pawl 23 is disposed forwardly of the axis 22 of the pivotal motion of the pull tab 11 relative to the slider body 10. The lock slider according to this invention can therefore be held locked positively once the pull tab 11 is pivoted to the recumbent position on the slider body 10.

75 Furthermore, with the pull tab 11 in the recumbent position, the locking pawl 23 is maintained in its working position of Figure 2 not only by the lugs 16 and 17 but also by

the abutment 25 in engagement with the pawl tip 26. The locking pawl 23 is therefore supported at its opposite ends, so to say, so that the locking pawl, while undergoing elastic deformation as aforesaid, functions to positively press the fastener elements 15 against the slider body bottom wing 13 at its contact point 24. Still further, since such elastic deformation of the locking pawl does not occur concentratedly at its end 30 connected to the pull tab 11, the locking pawl does not suffer permanent deformation for a markedly extended length of time.

15 WHAT WE CLAIM IS:—

1. A slider which can be locked against movement in a desired position on rows of interlocking fastener elements of a sliding clasp fastener, comprising a body having top and bottom wings which are connected at their front ends so as to provide therebetween a Y-shaped guide channel for the fastener elements, there being an aperture in the top wing of the body, a pull tab connected at one end to the top wing of the body for pivotal motion relative to same about a predetermined axis, a locking pawl on said one end of the pull tab intruding into the guide channel in the body through the aperture in its top wing, the locking pawl having a predetermined point of contact with the fastener elements for pressing same against the bottom wing of the body when the pull tab is in a recumbent position on the body, the predetermined contact point of the locking pawl being disposed forwardly of the predetermined axis of the pivotal motion of the pull tab when the latter is in

the recumbent position, and an abutment formed on the inside surface of the top wing of the body and disposed forwardly of the aperture therein so as to be abutted upon by a tip of the locking pawl when the pull tab is in the recumbent position, the predetermined contact point of the locking pawl being disposed rearwardly of its tip when the pull tab is in the recumbent position.

2. A slider as recited in claim 1, wherein the bottom wing of the body has a depression formed in its inside surface for partly receiving the fastener elements pressed by the locking pawl.

3. A slider as recited in claim 2, wherein the depression has a sloping surface at its front end.

4. A slider as recited in claim 1, wherein the locking pawl has a groove formed longitudinally therein.

5. A slider as recited in claim 1, wherein the body has lug means formed on its top wing, and wherein the pull tab has at said one end thereof a pair of opposed L-shaped portions which are engaged with the lug means so as to permit the pivotal motion of the pull tab about the predetermined axis, the locking pawl being disposed between the pair of L-shaped portions.

6. A slider substantially as herein described with reference to and as illustrated in the accompanying drawing.

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the recumbent position, and an abutment formed on the inside surface of the top wing of the body and disposed forwardly of the aperture therein so as to be abutted upon by a tip of the locking pawl when the pull tab is in the recumbent position, the predetermined contact point of the locking pawl being disposed rearwardly of its tip when the pull tab is in the recumbent position.

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