April 28, 1942. N. J. POUX 2,281,009

LOCK SLIDER FOR SLIDE FASTENERS

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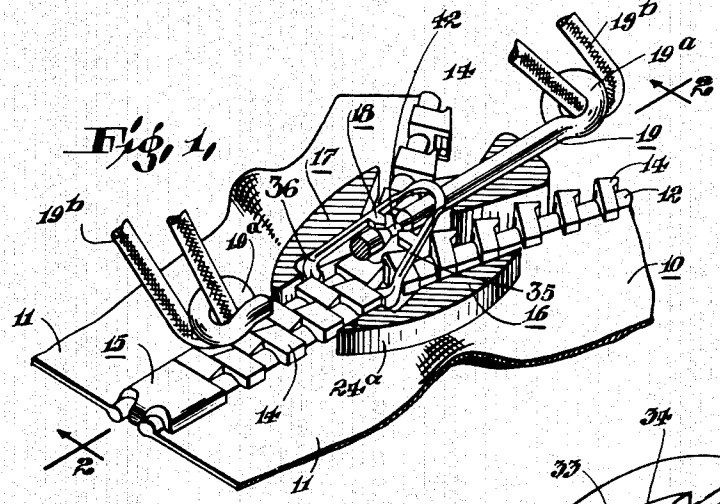

Fig. 1.

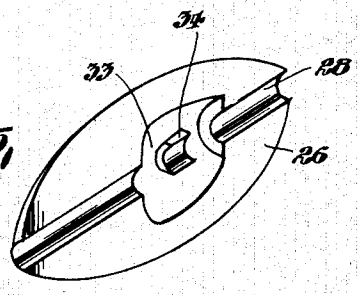

Fig. 5.

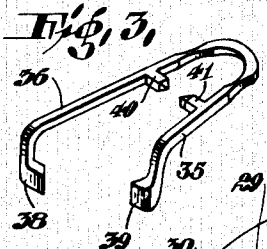

Fig. 3.

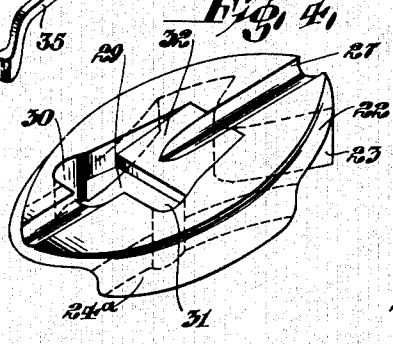

Fig. 4.

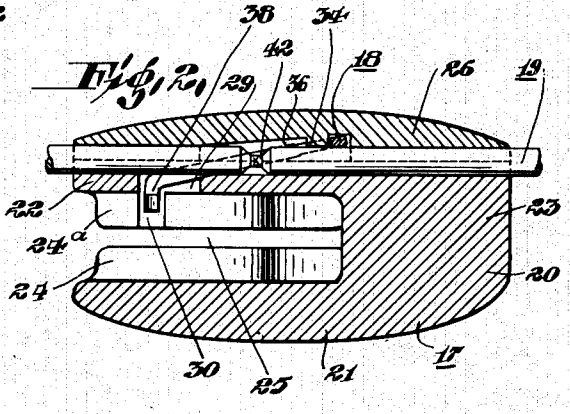

Fig. 2.

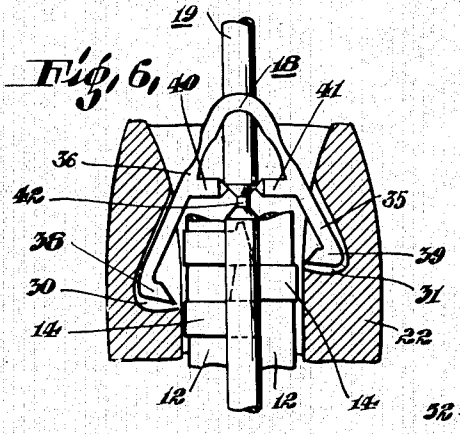

Fig. 6.

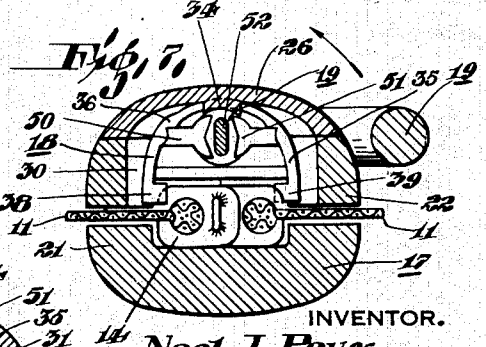

Fig. 7.

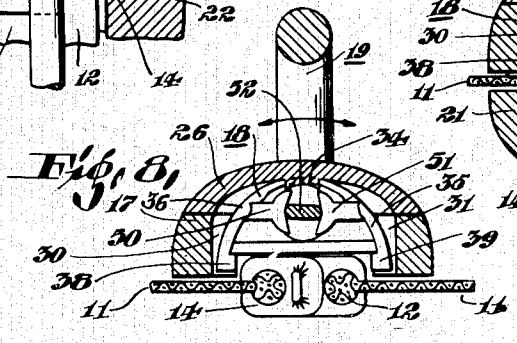

Fig. 8.

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LOCK SLIDER FOR SLIDE FASTENERS

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5 Claims. (Cl. 24—205.5)

This invention relates to slide fasteners and, in particular, to the provision of new and improved automatic lock sliders therefor.

It is an object of this invention to provide a new and improved automatic lock slider for slide fasteners wherein the locking mechanism includes means automatically operative normally to engage the leg end surfaces of the interlocking fastener members of both fastener stringers normally to lock the slider against longitudinal movement thereon, in combination with means conveniently manually operable for rendering the first means inoperative to free the slider for movement longitudinally of the stringers for opening and closing the fastener.

It is a further object of this invention to provide such a slider wherein the locking means is disposed substantially parallel to the plane of the interlocking fastener members and wherein desirable compactness is secured because of the incorporation of the locking means in the slider without substantial increase of the slider thickness and without obstruction or interruption of the forward or front surface of the slider.

It is a further object of this invention to provide such a slider construction which is particularly adapted for ease of manufacture, cheaply, by various known methods of slider manufacture from metallic materials and/or non-metallic plastic materials.

These and other objects and advantages of the invention will appear from the following description taken in conjunction with the accompanying drawing which forms a part thereof, and will be pointed out in the appended claims.

In the drawing:

Fig. 1 is a fragmentary view, in perspective, of a conventional slide fastener embodying an improved automatic lock slider according to this invention, parts being cut away in the interest of clearness of disclosure;

Fig. 2 is a longitudinal section taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a perspective view of the locking member of the slider shown in Fig. 1;

Fig. 4 is a fragmentary detail view illustrating the front wing portion of the slider body;

Fig. 5 is a view similar to Fig. 4, but showing the cap member associated with the front wing portion shown in Fig. 4 to house the locking means of Fig. 3 and the manually operable slider unlocking means;

Fig. 6 is a diagrammatic view showing the cooperative relationship of the automatic locking means and manually operable slider unlocking means, the parts being shown in unlocked position;

Fig. 7 is a transverse section illustrating a modification of the construction shown in Figs. 1 to 6, with the parts in locked position; and

Fig. 8 is a fragmentary transverse section similar to Fig. 7, but showing the parts in unlocked position.

Referring to the drawing in detail and with reference particularly to Fig. 1, the slide fastener shown in that figure comprises a pair of slide fastener stringers connected at their lower ends by a bottom stop and having a slider constructed according to this invention, movable longitudinally of the stringer for opening and closing the fastener.

The stringers are generally designated 10 and each comprises a tape 11 with a reinforced edge 12 and with predeterminedly spaced rows of complementary interlocking fastener members 14 secured in conventional manner to each reinforced edge 12. The bottom stop 15 is disposed at the lower ends of the rows of interlocking fastener members 14 and secured to the tapes 11 in conventional manner.

The slider is generally designated 16 and comprises a slider body, generally designated 17, having therein a locking member generally designated 18 which is normally operative to secure the slider against movement longitudinally of the stringers 10 and which is rendered inoperative by manual movement of the unlocking member generally designated 19, which unlocking member is operatively associated therewith in a manner which will be hereinafter most fully explained.

As shown in Figs. 2, 4, 5 and 6, the slider body comprises a main body portion 20 formed by a rear wing member 21 and a front wing portion 22 connected in spaced relationship by a wedge or neck portion 23, the back wing member 21 and front wing portion 22 being provided with similar longitudinal side flanges 24 and 24a at opposite sides which form, with the exterior surfaces of the neck or wedge portion 23, an upwardly diverging substantially Y-shaped fastener member guide channel 25.

The outer surface of the rear wing portion 21 is provided with a suitable gradually curved contour adapting it for sliding movement over surfaces disposed therebeneath in the operation of the slider. The outer surface of the front wing portion 22 is particularly adapted for the attachment of the cap member 26 which is complementary therewith and which forms there-

with a front wing member of substantially the same shape and size as the rear wing portion 21. The front wing portion 22 is provided with a central, longitudinally disposed, substantially semi-cylindrical unlocking member supporting recess or channel 27 which cooperates with a complementary similarly located recess or channel 28 in the cap member 26 to form a longitudinal unlocking member supporting channel or bore when the cap member is rigidly secured to the front wing portion 22 to form the front wing of the slider. The front wing portion 22 is also provided with an aperture 29 communicating with the fastener member guide channel 25, as shown in Figs. 2 and 4, the lower end of this aperture having its side walls defined by a pair of notches 30 and 31 which limit outward movement of the legs of the locking member 18 in unlocking the slider, as will hereinafter more clearly appear.

Adjacent the front end of the aperture 29 is a flat surface 32 which supports the locking member 18 and which cooperates with the boss 34 in the cap member 26 to retain the locking member 18 in operative position. This boss 34 is disposed substantially centrally of the recess or pocket 33 in the cap member 26 and has a part of the semi-cylindrical recess or channel 28 extending therethrough, as shown in Fig. 5. Thus, the complementary channels or recesses 27 and 28 form a longitudinal substantially cylindrical bore 27, 28 which receives and supports the manually operable unlocking member 19. The aperture 29, notches 30 and 31, surface 32 and recess or pocket 33 likewise form an enclosed pocket which supports and retains the locking member 18 in operative position.

The locking member 18, as shown in Fig. 3, is of bifurcated form, one leg 36 thereof being longer than the other leg 35 thereof a distance equal substantially to the longitudinal width of one interlocking fastener member or, in other words, the "pitch" of the fastener. Inwardly offset from the left leg 36 is the left locking projection 38, while a similar offset locking projection 39 is provided at the end of the right leg 35. Because of the difference in the lengths of the legs 35 and 36 and the consequent location of the projections 38 and 39, both projections are simultaneously engaged in locking position, and simultaneously withdrawn from engagement with the leg ends of the interlocking fastener members 14 in unlocking the slider.

Intermediate the ends of the legs 35 and 36, a pair of oppositely directed cam follower members 40 and 41 is provided, which cooperate with the cam surface provided on the locking member 19 to spread the legs 35 and 36 of the locking member 18 upon appropriate movement of the unlocking member 19.

The locking member 18 is formed, of course, of resilient material and is, in effect, a bifurcated spring member having oppositely directed offset locking projections at the ends of its legs, which legs are of unequal length, the locking projections being constantly urged inwardly toward one another by the inherent resiliency of the locking member 18 and being capable of being spread by cooperation of a cam on the manually operable unlocking member with the cam follower members 40 and 41, the cam and cam followers operating against the force of the inherent resiliency of the locking member 18.

The unlocking member which is generally designated 19 is provided either at one or both ends with suitable means such as the loops 19a facilitating manual reciprocation thereof either directly or by secondary means, such as the thong 19b. Intermediate its ends the unlocking member 19 is provided with a double-acting cam 42 which comprises a reduced cylindrical portion having oppositely directed frusto-conical surfaces joining it with the cylindrical portion of the unlocking member 19, as shown in Figs. 1, 2 and 6. Normally the inherent resiliency of the locking member 18 causes the cam follower members 40 and 41 to seek the above-described reduced cylindrical surface of the cam 42, whereby the locking projections 38 and 39 are resiliently biased inwardly into engagement with leg end surfaces of the interlocking fastener members 14, as shown in Fig. 1. This position of parts is automatically assumed when the locking member 19 is free.

As will be clearly understood, when the locking projections 38 and 39 are thus engaged between the leg end surfaces of adjacent interlocking fastener members 14 on the respective stringers 10, longitudinal movement of the slider on the stringers is effectively prevented and the slider is locked. To unlock the slider, it is merely necessary to pull the unlocking member 19 either upwardly or downwardly with respect to the slider to engage one of the frusto-conical surfaces of the cam 42 with the cam follower members 40 and 41 which are thrust apart thereby, whereby the resilient locking member 18 is spread to disengage the locking projections 38 and 39 from the interlocking fastener members 14, as shown in Fig. 6.

As an alternative, as shown in Figs. 7 and 8, a pair of cam follower members 50 and 51, which are responsive to a rotary cam surface, may be substituted for the above-described cam follower members 40 and 41 on the interlocking member 18. Likewise, the unlocking member 19 may be provided with a rotary cam 52 adapted to release the cam follower members 50 and 51 in one or more positions of the rotary unlocking member 19 (Fig. 7) or to engage them in another position and thrust them apart to spread the resilient locking member 18 and free the locking projections 38 and 39 thereof from engagement with the interlocking fastener members 14 on each stringer 10 of the fastener.

It will thus appear that sliders constructed according to this invention embody completely enclosed bifurcated or substantially U-shaped resilient locking members straddling the interlocking fastener members of the fastener stringers of the fastener, the locking members having at their extremities or leg ends, inwardly, oppositely directed, locking projections normally yieldingly engaged with the leg end surfaces of the interlocking fastener members on the stringers by reason of the inherent resiliency of the locking member, the locking member being provided with cam follower surfaces engageable with cam surfaces on a manually movable unlocking member which acts through the cam and cam follower surfaces, upon suitable movement of the unlocking member, to spread the locking member and release the locking projections from engagement with the leg end surfaces of the interlocking fastener members on the stringers of the fastener. In one case, as shown in Figs. 1 to 6 inclusive, the cam surfaces on the manually operable unlocking member are responsive to reciprocatory movement of the unlocking member; while in the

other case, as shown in Figs. 7 and 8, the cam surfaces are rotary cam surfaces responsive to rotary movement of the manually operable unlocking member.

It is, of course, to be understood that the above description is merely illustrative and in nowise limiting and that I desire to comprehend within my invention such modifications as are included within the scope of the appended claims.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a slider for slide fasteners, a slider body comprising a pair of spaced, connected wing members forming an upwardly divergent fastener member guide channel therebetween, one of said wing members having therein an enclosed pocket communicating through an aperture with said fastener member guide channel and having an unlocking member supporting channel, a bifurcated resilient locking member supported in said pocket, and offset oppositely directed locking projections at the free ends of said locking member extending through said aperture into said channel and normally engaging the leg end surfaces of interlocking fastener members in said channel, said locking member being provided with spaced cam follower surfaces, and a manually operable unlocking member having a cam disposed between said cam follower surfaces, and cooperating with said cam follower surfaces upon movement of said unlocking member to spread said resilient locking member and withdraw said locking projections from engagement with interlocking fastener members in the guide channel of said slider body.

2. In a slider for slide fasteners, a slider body comprising a pair of spaced connected wing members forming an upwardly divergent fastener member guide channel therebetween, one of said wing members having therein an enclosed pocket communicating through an aperture with said fastener member guide channel and a longitudinal unlocking member supporting bore extending into said pocket, a bifurcated resilient locking member supported in said pocket and having offset oppositely directed locking projections at the free ends thereof extending through said aperture into said channel and normally engaging the leg end surfaces of interlocking fastener members in said channel, said locking member being provided with spaced cam follower members, and a manually operable unlocking member having a cam disposed between said cam follower members and cooperating with said cam follower surfaces upon reciprocating movement of said unlocking member to spread said resilient locking member and withdraw said locking projections from engagement with interlocking fastener members in the guide channel of said slider body.

3. In a slider for slide fasteners, a slider body comprising a pair of spaced connected wing members forming an upwardly divergent fastener member guide channel therebetween, one of said wing members having therein an enclosed pocket communicating through an aperture with said fastener member guide channel and a longitudinal unlocking member supporting bore extending into said pocket, a bifurcated resilient locking member supported in said pocket and having offset oppositely directed locking projections at the free ends of said locking member extending through said aperture into said channel and normally engaging the leg end surfaces of interlocking fastener members in said channel, said locking member being provided with spaced cam follower members, and a manually operable unlocking member supported in said bore and having a rotary cam disposed between said cam follower members and cooperating with said cam follower members upon rotary movement of said unlocking member, to spread the ends of said resilient locking member and withdraw said locking projections from engagement with interlocking fastener members in the guide channel of said slider body.

4. In a slider for slide fasteners, a slider body comprising a pair of spaced connected wing members forming an upwardly divergent fastener member guide channel therebetween, one of said wing members having therein an enclosed locking member receiving pocket communicating through an aperture with said fastener member guide channel and a longitudinal unlocking member supporting bore extending into said pocket, a bifurcated resilient locking member supported in said pocket, said locking member having legs straddling interlocking fastener members in said channel and having offset oppositely directed locking projections at their ends extending through said aperture into said channel and normally engaging the leg end surfaces of interlocking fastener members in said channel, said locking member being provided with laterally spaced cam follower members, and a manually operable reciprocating unlocking member supported in said bore and having a double acting reciprocating cam disposed between said cam follower members and cooperating with said cam follower surfaces upon movement of said unlocking member against the inherent resiliency of said locking member to spread said resilient locking member and simultaneously to withdraw both said locking projections from engagement with interlocking fastener members in the guide channel of said slider body.

5. In a slider for slide fasteners, a slider body comprising a pair of spaced connected wing members forming an upwardly divergent fastener member guide channel therebetween, one of said wing members having therein an enclosed pocket communicating through an aperture with said fastener member guide channel and a longitudinal unlocking member supporting bore extending longitudinally through said pocket, said aperture having leg movement limiting grooves at its lower end, a bifurcated resilient locking member supported in said pocket and having legs differing in length by one fastener pitch distance and offset oppositely directed locking projections at the free ends of said locking member extending through said aperture into said channel and normally urged by the inherent resiliency of said locking member into engagement with the leg end surfaces of interlocking fastener members in said channel, said locking member being provided with laterally spaced cam follower members, and a manually operable rotary unlocking member having a rotary cam disposed between said cam follower members and forcing apart said cam follower members upon rotary movement of said unlocking member to spread said resilient locking member and simultaneously to withdraw both said locking projections from engagement with interlocking fastener members in the guide channel of said slider body, the leg movement limiting grooves in said aperture limiting the degree of spreading of the legs of said locking member.

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