Feb. 28, 1956 K. J. STALLER ET AL 2,736,079

SLIDER FOR SLIDE FASTENERS

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Fig.1

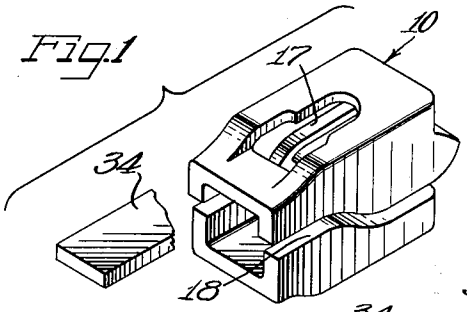


Fig.2

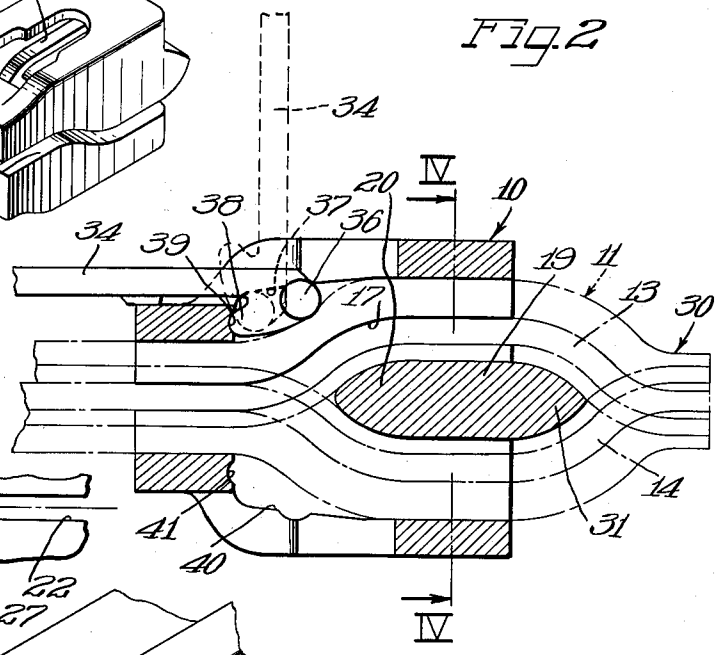
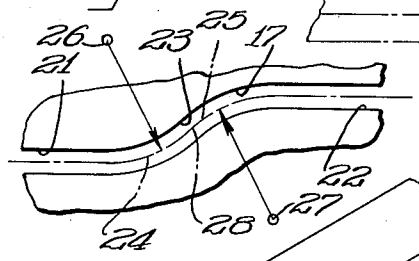


Fig.5



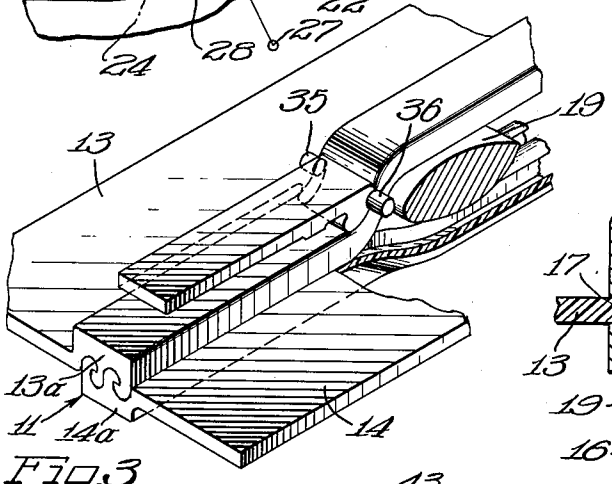
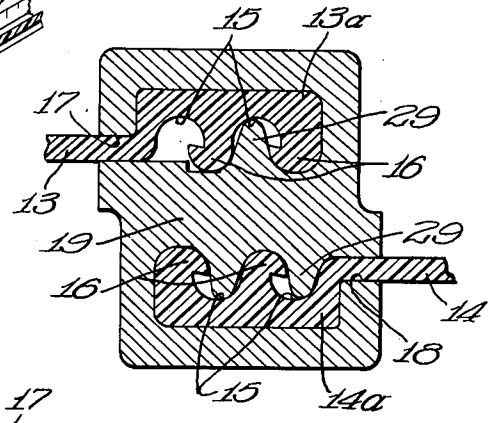


Fig.3

Fig.4



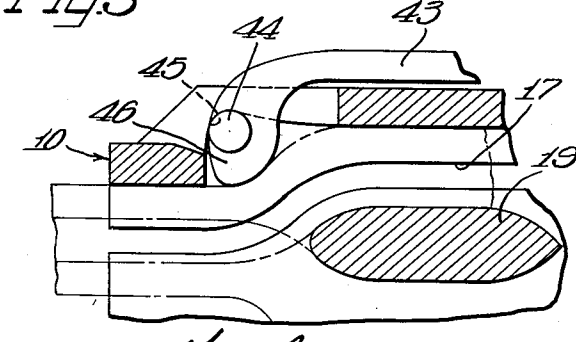


Fig.6

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SLIDER FOR SLIDE FASTENERS

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2 Claims. (Cl. 24—201)

This invention relates to a slider for slide fasteners and more particularly to a compact economically manufacturable slider lockable in position, having a substantially constant resistance to movement and operative to secure the slide fastener in water-tight and air-tight assembly.

The slider illustrated and described in this application is particularly designed for use in engaging and disengaging overlapping marginal portions of flexible slide fastener members of the type in which the overlapping marginal portions have alternate elongated channels and projections which interlock when the marginal portions of the two flexible members are pressed together. It will be understood, however, that the slider, according to the principles of this invention, may be used with other types of slide fasteners.

According to this invention, the slider has a pair of slots in opposite sides thereof for receiving the overlapping marginal portions of the flexible slide fastener members. The slots are smoothly curved so as to uniformly guide the marginal portions into and out of engagement as the slider is moved in opposite directions therealong. Each of the curved slots preferably has a center line defined by two arcs having centers on either side thereof with the distance between the centers equal to the radius of one arc plus the radius of the other. By this feature, for any given maximum resistance to movement, the slider may take the most compact form possible. In addition, this form of the slots results in a uniform bending of the flexible slide fastener members and the possibility of breakage of the members is minimized.

According to another feature of this invention, the slider has a bridge portion disposed between the overlapping marginal portions of the flexible slide fastener members and having a smoothly tapered forward end cooperating with the smoothly curved slots and uniformly guiding the marginal portions into and out of engagement. The bridge portion may also have a smoothly tapered rearward end for wedge engagement between the marginal portions at the limit of the closing movement of the slider. The tapered forward and rearward ends of the bridge portion then effect a water-tight and air-tight engagement with the marginal portions of the flexible slide fastener members.

Another feature of this invention is in the provision of means for locking the slider in any given position along the marginal portions of the flexible slide fastener members. In one embodiment, a lock member has abutment means cammingly engaged within the slider for pressing a portion of the lock member into engagement with one of the marginal portions upon longitudinal movement thereof relative to the slider and second abutment means interlockingly engageable with the slider upon pivotal movement of the lock member about the first abutment means. In a second embodiment, a lock member is pivotally mounted on the slider and has a cam portion for pressing against one of the marginal portions of the flexible slide fastener members. In both embodiments the

lock member is held in locked position by the pressure applied thereagainst from the deformed portions of the flexible resilient slide fastener members.

An object of this invention, accordingly, is to provide a slider for slide fasteners which is compact and easily and economically manufacturable.

Another object of this invention is to provide a slider for slide fasteners offering substantially constant resistance to movement.

A further object of this invention is to provide a slider adapted to close a slide fastener so as to be substantially water-tight and air-tight.

A still further object of this invention is to provide means for locking a slider in position on a slide fastener.

Other objects, features and advantages of the present invention will become more fully apparent from the following detailed description taken in conjunction with the accompanying drawings which illustrate preferred embodiments and in which:

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

Figure 2 is a longitudinal cross-section of the slider of Figure 1 and illustrates one form of locking means;

Figure 3 is a view illustrating the cooperation of the slider with the marginal portions of a pair of flexible slide fastener members, certain portions of a slider being broken away for clarity of illustration;

Figure 4 is a cross-sectional view taken substantially along lines IV—IV of Figure 2;

Figure 5 is a view illustrating the configuration of the slots in the slider; and

Figure 6 is a partial longitudinal cross-section similar to Figure 2 but illustrating another preferred form of locking means.

Referring to the drawings:

Reference numeral **10** designates a slider which, by the principles of this invention, may be adapted for use with various types of slide fasteners but is particularly designed for use with a slide fastener generally designated by reference numeral **11** and best illustrated in Figures 3 and 4. Referring thereto, the slide fastener **11** includes a pair of members **13** and **14** having overlapping marginal portions **13***a* and **14***a*, respectively. Each of the marginal portions **13***a* and **14***a* is provided with alternate longitudinal channels **15** and ribs **16** which interlock to secure the members **13** and **14** together when the marginal portions **13***a* and **14***a* thereof are pressed into engagement.

The slider **10** is arranged to move longitudinally along the marginal portions **13***a* and **14***a* to engage the same when moved in one direction and disengage the same when moved in the opposite direction. The slider **10** is provided with slots **17** and **18** in opposite sides thereof to receive the marginal portions **13***a* and **14***a*, respectively, in overlapping relation. The slots **17** and **18** are herein internally enlarged to interlockingly receive the marginal portions **13***a* and **14***a*, respectively, of the illustrated slide fastener which are thicker than the adjoining portions of the members **13** and **14**. The slots **17** and **18** are coextensive at the forward end of the slider **10** but are spaced at the rearward end of the slider **10** by a connecting or bridge portion **19** which, in operation, is positioned between the overlapping marginal portions **13***a* and **14***a* of the flexible slide fastener members **13** and **14**, respectively.

According to this invention, the slots **17** and **18** and the bridge **19** cooperate to uniformly guide the marginal portions **13***a* and **14***a* into and out of interlocking engagement as the slider is moved in opposite directions therealong. For this purpose, the slots **17** and **18** are smoothly curved and the bridge **19** has a smoothly tapered forward end portion **20**.

A preferred configuration of the slots **17** and **18** is

illustrated in Figure 5, in which reference numerals **21** and **22** designate the transversely spaced forward and rearward end portions and reference numeral **23** designates an intermediate smoothly curved portion of the slot **17**. The forward and rearward end portions **21** and **22** may be angularly disposed but are preferably generally parallel as illustrated in Figure 5. The smoothly curved intermediate portion **23** has a center line defined by two arcs **24** and **25** having centers **26** and **27**, respectively, on either side of the slot with the distance between the centers **26** and **27** equal to the radius of the arc **24** plus the radius of the arc **25** so as to join at an inflection point **28**. With this configuration of the slot, the transverse position of each flexible slide fastener member is changed enough to disengage it from the other with the angle of bend and the possibility of breakage of the member at a minimum and with a minimum total length of the slot relative to the resistance to movement of the slider. It will also be apparent that the resistance to movement of the slider is substantially constant and can be varied by changing the radii of the arcs **24** and **25**.

According to another feature of this invention, the bridge **19**, as shown in Fig. 4, may have integral ribs **29** arranged to extend between the ribs **16** of the flexible members to define slots receiving the same for guiding the slider in movement and to aid in separation and engagement of the flexible members with minimum binding action between the slider and the flexible members. As shown at the top side and bottom side of the bridge **19**, respectively, either one or two ribs **29** may be provided, and more may be used if the flexible members have more than two ribs.

According to a further feature of this invention, the bridge **19** is formed to have a water-tight and air-tight engagement with the flexible slide fastener members in the closed position of the slider. It will be apparent that the interlocking engagement of the channels **15** and ribs **16** provides a substantially water-tight and air-tight engagement between the slide fastener members **13** and **14**. The members **13** and **14**, as illustrated in phantom lines in Figure 2, may be secured into engagement at one point designated by reference numeral **30** in any desired manner such as by a clamp, by gluing or by bonding. The bridge **19** has a smoothly tapered rearward end portion **31** to wedge into engagement between the marginal portions **13***a* and **14***a* when the slider is moved to the limit of its rearward closing movement toward the point **30** to thus provide a substantially water-tight and air-tight engagement. The smoothly tapered forward end portion **20** of the bridge **19**, in addition to cooperating with the slots **17** and **18** in guiding the marginal portions **13***a* and **14***a* into and out of engagement, also engages between the marginal portions **13***a* and **14***a* to prevent flow of air and water therebetween.

An important feature of this invention is in the provision of means for locking the slider **10** in any given position along the marginal portions **13***a* and **14***a*. As shown in Figures 2 and 3, a lock member **34** has a pair of abutment pins **35** and **36** projecting therefrom which may ride against cam surfaces **37** within the slider **10**. When the lock member **34** is moved longitudinally relative to the slider **10**, from left to right in Figure 2, the cam surfaces **37** will act on the pins **35** and **36** to press the lock member toward the bridge **19** to deform one of the marginal portions of the flexible slide fastener members. The slider will then be frictionally held in position. To secure the lock member **34** in position, an abutment portion **38** thereof is arranged to engage in a recess **39** in the slider **10** when the lock member **34** is pivoted counterclockwise, Figure 2, about the abutment pins **35, 36**. It will be noted that, in this position, the pressure of the deformed marginal portion will hold the lock member **34** in position. It may also be noted that the lock member, in this position, is disposed compactly in generally parallel relationship to the flexible slide fastener members but may be pivoted to a position such as illustrated in dotted lines in Figure 2 to release the slider for movement and to provide a handle for moving the slider.

The lock member **34** is generally provided only on one side of the slider **10** but, if desired, two lock members on either side of the slider **10** may be provided or the slider **10** may be constructed so that a single lock member may be assembled in either side of the slider. For this purpose, the slider may be provided with a cam surface **40** and a recess **41**, corresponding to the surface **37** and the recess **39**, in the opposite side of the slider.

Another preferred embodiment of lock means is illustrated in Figure 6. Referring thereto, a lock member **43** has pins **44** thereon pivotally journaled in recesses **45** within the slider **10**. The lock member **43** has a cam portion **46** for pressing against one of the flexible slide fastener members when the lock member **43** is in the illustrated position. The lock member **43** may be pivoted to a outwardly projecting position relative to the flexible slide fastener members to release the slider **10** for movement and to provide a handle for moving the slider **10**.

It will accordingly be apparent that, by this invention, a slider for slide fasteners is provided which is compact, easily and economically manufacturable, readily locked in position, movable in opening and closing directions with substantially constant resistance to movement, and substantially water-tight and air-tight.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

We claim as our invention:

1. In a slider for engaging and disengaging overlapping marginal portions of a pair of flexible slide fastener members upon reciprocable movement along said marginal portions, a lock member having first abutment means cammingly engaged within the slider for pressing a portion of said lock member into engagement with one of said marginal portions on longitudinal movement thereof relative to the slider, and second abutment means on said lock member interlockingly engageable within the slider on pivotal movement of said lock member about said first abutment means.

2. A slider having a pair of slots therein for receiving superposed marginal portions of a pair of flexible slide fastener members and arranged to guide said marginal portions into and out of engagement as the slider is reciprocally moved therealong, the center line of a portion of each of said slots being substantially defined by two arcs having centers on either side thereof with the distance between said centers equal to the radius of one arc plus the radius of the other.

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