Dec. 5, 1967 C. W. ELSENHEIMER 3,355,778

LOCKING SLIDER FOR SLIDE FASTENERS

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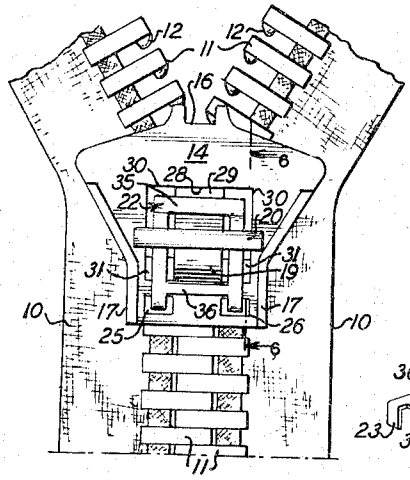


FIG. 1

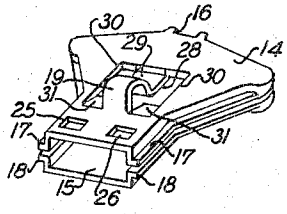


FIG. 2

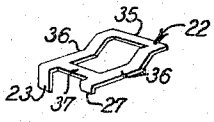


FIG. 3

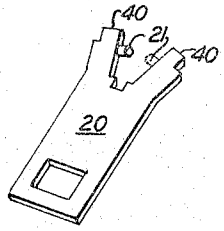


FIG. 4

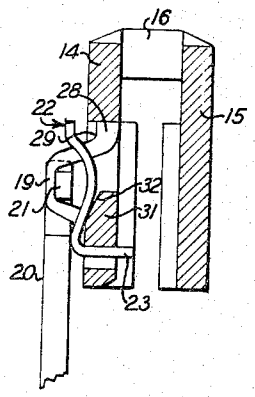


FIG. 5

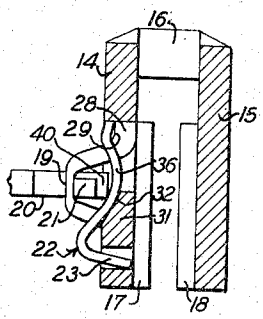


FIG. 6

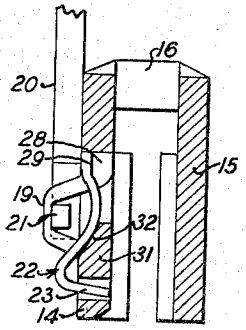


FIG. 7

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LOCKING SLIDER FOR SLIDE FASTENERS

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This invention relates to separable fasteners of the slide operated type and more particularly to an improved automatic lock slider for such fasteners.

In automatic lock sliders of the type of the present invention, the slider has in the past been automatically locked by a cam, or a loose pawl, or a spring biased locking member, all of which are usually controlled by a pull tab for moving the slider in the opening or closing directions. These various types of locking means are often complicated in structure and therefore costly to make. If the locking member is spring operated, or of the loose lug type, there are usually required additional parts on the lug to which the pull tab is attached, thereby providing the slider structure with a high silhouette. On the other hand, certain loose lug types are located on the exteriors of the slider bodies, and the cams in cam operated locks are usually provided on the pull tabs. All of such types of slide structures are destructive of the material of the garments to which they are attached during the pressing of such garments. This is especially true with respect to pants and uniforms provided with fasteners having automatic lock sliders. These automatic lock sliders have therefor been a serious problem to the industrial laundry field and while the art has endeavored to provide automatic sliders which would be free of the aforesaid disadvantages, it has not been able as yet to produce such a slider which is completely satisfactory both to the slide manufacturer, to the laundry company and to the user.

The primary purpose of the instant invention is to provide an improved automatic lock slider which is free of the aforesaid disadvantages.

Another object of the invention is to provide an automatic lock slider which has a silhouette of minimum height and which has no protruding parts capable of damaging clothing during pressing operations.

A further object of the invention is to provide an automatic lock slider which is of such exceedingly simple design that it can be made at cost not substantially greater than a non-locking slider.

A still further object of the invention is to provide an improved slider which can be utilized etiher as a non-locking slider, or an automatically locking slider, and which can be readily made as one type or the other during the assembly of the parts thereof.

Other objects and advantages of the invention, as well as the novel features of construction thereof, will appear from a perusal of the following description when read in connection with the accompanying drawings, in which

FIG. 1 is a plan view of a portion of a fastener equipped with the slider of this invention and with the pull tab in raised position;

FIG. 2 is a perspective view of the body of the slider;

FIG. 3 is a perspective view of the locking member of the slider;

FIG. 4 is a perspective view of the pull tab of the slider;

FIG. 5 is a longitudinal sectional view of the slider with the pull tab in the down or depending position;

FIGS. 6 and 7 are views similar to FIG. 5 and show the condition of the parts when the pull tab is in the position in which it is gripped for moving the slider, and when the pull tab is in its fully raised position, respectively.

In FIG. 1 of the drawings there is shown a portion of the fastener stringers **10** having the usual interlocking members **11** secured to the opposed edges thereof. As is conventional, the members **11** have projections **12** which engage recesses thereon (not shown) to lock such members in interfingered relation. The engagement and disengagement of the interlocking members **11** are controlled in the usual manner by the longitudinal movements of a slider body composed of a front plate **14**, a rear plate **15** and a connecting separator **16** (note FIGS. 5–7). The plates **14** and **15** have the usual side guide flanges **17** and **18**, respectively. As is shown in the drawings, the slider body is also provided with a pull tab lug **19** to which a pull tab **20** is movably and pivotally connected by means of inwardly disposed, opposed, retaining projections **21** provided on the pull tab, as is conventional. Straddling the lug **19** and located between the attached end of the pull tab **20** and the front plate **14** of the slider, is a locking pawl or rocker member **22** having a locking tooth **23** which interlocks with the members **11** to secure the slider against movement on the stringers **10**.

The slider body in addition to having the conventional features above described, is provided in the lower narrow end of its front plate **14**, below the lug **19**, with two rectangularly-shaped, transversely aligned, spaced cutouts or openings **25**, **26**. The locking tooth **23** of the pawl **22** extends through the opening **25**, and a guide member **27** projecting from the lower end of the pawl **22** in spaced parallel relation to the locking tooth **23**, extends into the opening **26**. The guide member **27** is shorter than the locking tooth **23**, being only long enough to remain engaged with the opening **26** throughout the range of movements of the locking tooth **23** without coming into locking engagement with the interlocking members **11**. The guide member **27** has a configuration similar to the corresponding portion of the locking tooth **23**.

The lug **19**, which is located above and centrally of the two transversely spaced openings **25**, **26**, is formed from the material of plate **14** so that it is integral therewith, and has a lower outwardly projecting U-shaped portion which receives the retaining portions **21** of the pull tab. The upper portion **28** of the lug **19** is located between the outer and inner surfaces of the plate **14**, and is reduced in thickness by removal of the material on its outer surface so that there is formed a seat **29** of a depth approximating the thickness of the material in the pawl **22**. The plate **14** is pierced on each side of the lug **19** to form two elongated, rectangularly-shaped openings **30**, **30** which extend longitudinally of the plate **14** from the upper end of lug portion **28** to a place past the midpoint of the lower U-shaped projecting lug portion. The lower ends of the openings **30**, **30** are defined by the upper ends of two square-shaped coined areas **31**, **31** which are as wide as the openings **30**, **30** and extend to the lower end of the lug **19**. The two areas have each been worked to provide therein an outer inclined surface **32** which extends inwardly and upwardly from the outer surface of the plate **14** at the lower end of the lug **19** to the lower end of an opening **30**. The coined areas **31**, **31** and the openings **30**, **30** are substantially aligned with the openings **25** and **26** for the locking tooth **23** and the guide member **27** (note FIG. 2).

The rocker member or locking pawl **22**, as is shown more clearly in FIG. 3, is a rectangular, ring or frame-shaped member made from a thin sheet of resilient metal, such as spring steel, that has been punched to provide a central opening through which extends the U-shaped projecting portion of the lug **19**. This central opening is bordered by an upper transverse bar **35**, two longitudinally extending side bars **36**, **36** and a lower transverse bar **37** from which depend the locking tooth **23** and the guide member **27**. The upper bar **35** extends across the upper

ends of the openings 30, 30 and sits in the seat 29 provided on the outer side of the lug portion 28. The two side bars 36, 36 extend lengthwise of the openings 30, 30 and over the inclined outer surfaces 32, 32 of the coined areas 31, 31. The two side bars 36, 36 are arcuately-shaped so that they are enabled to rock on such inclined surfaces 32, 32. The pawl 22 is bent in a convex fashion in the region of the lower bar 37 so that the locking tooth 23 and guide member 27 are directed inwardly through the openings 25 and 26, respectively. It will be noted from FIG. 7 of the drawings, that the configuration of the locking pawl 22 is such that when the upper bar 35 thereof is positioned in the seat 29 and such pawl is hanging on the upper end of the U-shaped projecting portion of lug 19, the locking tooth 23 and guide member 27 will be in their fully withdrawn positions, thereby enabling the slider to move freely down the stringers 10, 10.

The locking pawl 22 is permanetly retained in position on the slider by the pull tab 20 which is provided with two longitudinally extending projections 40, 40 at its attached end that are engageable with such pawl during the manipulation of the pull tab in the use of the device. When the slider is to be in a condition in which it can readily be fed onto the stringers 10, 10, or in which it is readily strippable, i.e., freely movable in the down or opening direction on the stringers 10, 10, as during laundering operations, the pull tab should be in the up or unlocked position shown in FIG. 7 of the drawings. In this position of the pull tab, its outer surface is substantially in engagement with the outer surface of the front plate 14 and bears against the top bar 35 of the pawl 22 to maintain the locking tooth 23 fully withdrawn as previously explained. When the slider is in the upright position, as when the garment is being worn, the pull tab will be maintained in this up position by the engagement of the projections 40, 40 thereof with the lower portions of the pawl sides 36, 36 and can only be moved from such position by a positive movement thereof against the spring-like resilience of the pawl 22.

While the slider is being positively moved on the stringers 10, 10, either upwardly or downwardly, the pull tab is gripped by the user and is disposed transversely to the slider body as shown in FIG. 6 of the drawings. In this position of the pull tab, the projections 40, 40 thereof will bear down on the sides 36, 36 of the pawl and press them against the inclined outer surfaces 32 of the coined areas 31, thereby tending to retain the top bar 35 of the pawl 22 in its seat 29 and the locking tooth 23 retracted. Because of the contour of the pawl sides 36, 36, the slope of the inclined surfaces 32 and the openings 30, 30, the projections 40, 40 will hold the locking pawl positioned so that the locking tooth cannot move into locking relation with the interlocking members 11 throughout the pivotal movement of the pull tab 20 from its up position shown in FIG. 7 to a down position in which the under surface of the pull tab comes to rest on the convex portion of the locking pawl 22 in the region of the lower bar 37 thereof.

As is shown in FIG. 5 of the drawings, in the down position of the pull tab 20, its pivotal axis will be shifted outwardly within the U-shaped projecting portion of the lug 19 so that while such pull tab is parallelly disposed with relation to the front plate 14, its under surface will be spaced from the outer sruface of such plate. This shifting of the axial position of the pull tab is rendered possible by reducing the thickness of the retaining projections 21 on their outer surfaces so that the latter are recessed with respect to the outer surface of the pull tab and are unlike the under surfaces thereof which are flush with the under surface of the pull tab. It will also be noted from FIG. 5 that in this position of the pull tab, the latter will under the gravity of its weight, rock the locking pawl 22 on the inclined surfaces 32 to cause the top

bar 35 thereof to move out of its seat 29 and enable the locking tooth 23 to move into locking engagement with the interlocking members 11, thereby locking the slider in a fully or partially interlocking position on the stringers 10, 10. The pull tab will be prevented from being inadvertently jiggled out of its depending locking position and until positively removed therefrom by the coaction of the projections 40 thereof with the stainless steel rocker member. Due to the fact, however, that the rocker member 22 is made of a resilient, spring-like thin metal it is possible to strip the slider, or cause it to ride down on and separate the interlocked members 11 of the closed stringers 10, 10 below the slider even though the pull tab 20 is in the aforesaid down position. This may be done by grasping the top portion of each stringer, one in each hand, and pulling in opposite directions with a force beyond that to which the stringers would be subjected to in the normal use of the garment to which the fastener is applied. When such a force is exerted, the locking tooth 23 which is in the nature of a spring finger having a blunt, or straight transverse terminal edge, will move out from its locking position and with a springing action skip from one spaced interlocking member to the other so long as such force is applied and until the slider reaches the bottom of the fastener. This strippable characteristic of the slider of this invention is of especial advantage when garments having fasteners equipped with this slider are carelessly handled in a commercial laundry during the performance of washing and pressing operations thereon. Many of the sliders or fasteners now being presently employed in garments must be replaced often because of the treatment they receive while the garments are being washed and pressed in commercial laundries. The slider of this invention will substantially overcome this replacement problem now caused by commercial laundries.

It will be noted that as a result of the foregoing construction, the slider of the instant invention is very simple, consisting of three parts: (1) the slider body, (2) the stainless steel pawl or rocker member 22 and, (3) the pull tab 20. The slider body and rocker member are so formed that the latter can readily be placed in position on the front plate 14 of the slider body with the lug 19 extending through the central opening thereof. The pawl or member 22 is readily made a permanent part of the slider by properly assembling the pull tab 20 on the lug 19 using a squeeze operation to effect the connection of the retaining projections 21 thereof with the lug 19.

While I have hereinabove described and shown in the accompanying drawings, a preferred embodiment of my invention, it will be apparent to those skilled in the art that modifications thereof may be made without departing from the spirit of the invention or the scope of the appended claims. Thus, instead of the openings 30, 30 and the coined areas 31, 31, the plate 14 may be configured in any other suitable manner to provide an indentation of such depth and contour as to permit the locking pawl or rocker member 22 to move in relation to the pull tab 20 in the manner previously described as the latter moves arcuately to its fully open or unlocked position to disengage the locking tooth 23 from the interlocking members 11, or to its fully closed or locked position to engage the locking tooth 23 with the interlocking members 11.

What is claimed is:

1. A locking slider for a slide fastener comprising a body having front and rear plates, the front plate of which is provided with an opening at its lower end, a lug provided on the front plate of said body, a rocker member seated on said front plate and having an opening through which said lug extends, the portions of said front plate underlying said rocker member being configured to enable said rocker member to rock longitudinally on said front plate, a locking tooth on the lower end of said

rocker member and extending inwardly through said front plate opening to enable it to come into locking engagement with the interlocking elements of the slide fastener, a pull tab pivoted on said lug and permanently connecting said rocker member to the slider, said pull tab having a portion bearing against said rocker member to maintain the latter positioned on said underlying plate portions so that said locking tooth is withdrawn from locking position when the pull tab is used to operate the slider, such bearing relation of said pull tab portion being discontinued and said pull tab pressing the lower end of said rocker member to cause said locking tooth to move inwardly to locking position when said pull tab is released in its down position.

2. A locking slider such as defined in claim 1, in which said rocker member is configured to hang on said lug with said locking tooth withdrawn to unlocked position when said pull tab is in fully raised position with the pressure of said bearing portion thereof on said rocker member discontinued, said pull tab in its down position disrupting such hanging relation of said rocker member on said lug.

3. A locking slider as defined in claim 1, in which said rocker member is a rectangular, ring-shaped member made from a sheet of resilient metal and having an upper transverse bar, two longitudinally extending side bars, and a lower transverse bar, said side bars being concavely shaped and constituting rocker bars on which said member rocks.

4. A locking slider as defined in claim 3, in which said locking tooth extends downwardly from said lower transverse bar of said rocker member, and including a guide member extending downwardly from said lower transverse bar in spaced parallel relation to said locking tooth, said front plate of said slider body having a second opening at its lower end arranged in transversely aligned, spaced relation to said first mentioned opening for receiving said guide member.

5. A locking slider as defined in claim 3, in which the portions of said front plate underlying said rocker member comprise an inclined surface on each side of said lug and extending upwardly and inwardly from the outer surface of said front plate at the lower end of said lug.

6. A locking member as defined in claim 5, in which the upper ends of said inclined surfaces form the lower edges of openings aligned with such surfaces and extending upwardly along the sides of said lug toward the upper end of said lug.

7. A locking member as defined in claim 3, in which the upper end of said lug is reduced in thickness to provide a seat for said upper transverse bar of the rocker member.

8. A locking member as defined in claim 3, in which said bearing portion of said pull tab comprise a pair of longitudinal extensions projecting from the attached end of the pull tab and engageable with said concavely shaped side bars of said rocker member.

9. A locking member as defined in claim 1, in which said pull tab is provided with a pair of opposed projections pivotally connecting said pull tab to said lug, said projections being reduced in thickness on the outer side thereof to enable the pivotal axis of said pull tab to be shifted relative to said front slider plate.

10. A locking member as defined in claim 7, in which the reduced upper end of said lug is located between the outer and inner surfaces of said front plate, said lug below said reduced upper end thereof being substantially U-shaped.

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