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LOCK SLIDER FOR SLIDE FASTENERS

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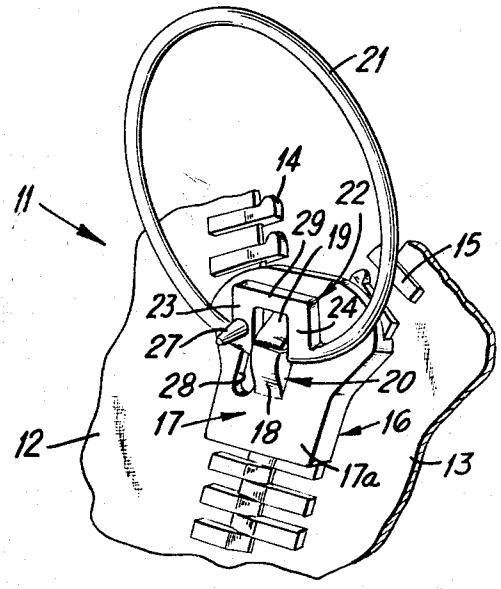



FIG. 1

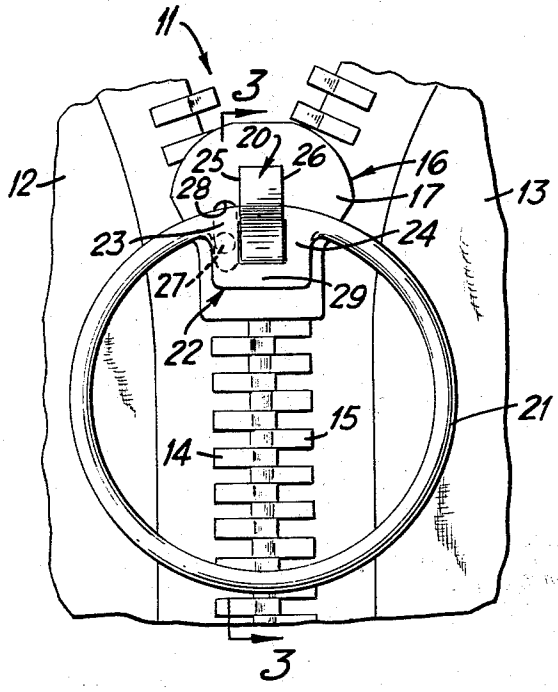



FIG. 2

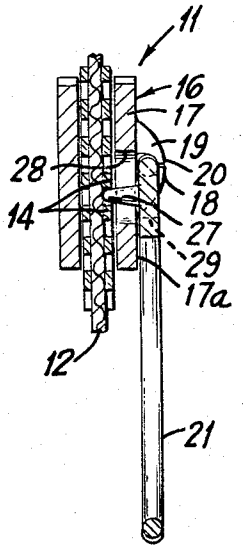



FIG. 3

INVENTOR.
DAVID SILBERMAN

BY Martin G. Reiff

ATTORNEY.

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# LOCK SLIDER FOR SLIDE FASTENERS

David Silberman, New York, N.Y., assignor, by mesne assignments, to Talon, Inc., a corporation of Pennsylvania

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5 Claims. (Cl. 24—205.14)

This invention relates to a zipper or slide fastener having a novel construction for locking the slider against accidental movement.

In the prior art one of the most effective locking constructions comprises a locking pin movable into engagement between a pair of the zipper teeth. The pin is mounted on a small metal tab which is pivoted to the slider so that the latter may be moved by manually grasping the tab and pulling thereon. Because of the small size of the tab and the opening therethrough the tab is held merely by frictional engagement by the fingers and it is impossible to insert a finger through the tab so as to exert a substantial force thereon.

Although this arrangement is adequate for many applications where it is unnecessary to exert a large pulling force on the slider, there are still other applications where the force necessary to actuate the slider conveniently is so large as to require the use of a large annular ring instead of the small metal tab. The opening in the ring is sufficiently large to receive one or more fingers therethrough so that the user may exercise a substantial pulling force in manipulating the slider.

However, the use of the ring arrangement has heretofore precluded the use therewith of said locking pin construction for several reasons. First, the ring had no provision for mounting the locking pin at the desirable radial distance from the pivotal axis of the ring for proper engagement with the zipper teeth. Second, the ring was slidable within the bearing which pivotally mounted the ring to the slider and if a locking pin were mounted on the ring the pin would not have been maintained in the required position for proper projection through the clearance opening in the slider. Third, the ring had no means to limit its pivotal movement to a locking position wherein the locking pin would be in proper engagement with the zipper teeth. Because of these factors prior zipper constructions of the ring manipulatable type employed other locking means less effective than the locking pin arrangement.

It is therefore a primary object of the present invention to provide a novel zipper construction wherein the slider is manipulated by an annular ring having an opening therethrough to receive one or more fingers of the hand for the manual application of substantial pulling force to the slider, and wherein the ring is provided with locking means responsive to pivotal movement of the ring to a locking position to lock the slider against movement.

A further object is to embody said locking means in the form of a locking pin engageable with the zipper teeth, the ring having novel means to mount the pin at the proper radial distance from the axis of pivotal mounting of the ring to the slider.

Still another object is to provide the ring with novel means to prevent axial movement of the ring within the bearing so that the pin will be maintained in the proper position for projection through the clearance opening in the slider.

A further object is to provide the ring with a novel means to stop the pivotal movement of the ring to a locking position wherein the locking pin is properly engaged with the zipper teeth.

Other objects and advantages of the present invention are either inherent in the structure disclosed or will become apparent to those skilled in the art as the description proceeds in connection with the accompanying drawings wherein:



FIGURE 1 is a perspective view of a preferred form of zipper construction embodying the present invention;

FIGURE 2 is a front elevattional view thereof; and

FIGURE 3 is a vertical longitudinal sectional view taken substantially on the line 3—3 of FIGURE 2.

Referring now to the drawing in more detail, the reference numeral **11** indicates generally a preferred form of zipper construction in accordance with the invention and comprising a pair of tapes or stringers **12, 13** adapated to be sewn or otherwise attached to the respective opposite edges of the opening to be closed by the zipper **11**. The opposing edges of stringers **12, 13** are provided with rows **14, 15** of elements or teeth adapted to be interengaged by upward movement of a slider **16** and disengaged by downward movement of slider **16**, in the usual manner.

As thus far described in the above paragraph, the structure is conventional, and the shape of teeth **14, 15** and the internal structure of slider **16** whereby teeth **14, 15** interengage will not be described because such structure is well-known in the art and forms no part of the novelty of the present invention.

The forward wall **17** of slider **16** is provided with a substantially planar front face **17*a*** and is also provided with two arcuate ears **18, 19** coacting to form a bearing **20** having therethrough a cylindrical opening extending perpendicular to the direction of movement of slider **16** and having an axis located forwardly of the front face **17*a***.

A relatively large circular annular ring **21** is provided with a segment extending through bearing **20** and rotatable therein whereby ring **21** is pivotally mounted to slider **16**. The opening in ring **21** is sufficiently large to permit the insertion of one or more fingers therethrough so that a substantial pulling force may be easily applied to ring **21** and hence to slider **16**.

A U-shaped bracket indicated generally at **22** is provided with a pair of parallel mutual-spaced elements **23, 24** having outer ends soldered, brazed or otherwise secured to the inner surface of ring **21**. Elements **23, 24** extend adjacent the respective lateral end surfaces **25, 26** of bearing **20** and are adapted to abut said surfaces **25, 26** to limit the ring segment within bearing **20** against excessive axial movement within the latter.

This limitation of axial movement is necessary to maintain in proper alignment a locking pin **27** fixedly secured to bracket element **23** and extending perpendicular therefrom. The forward wall **17** of slider **16** has a clearance opening **28** extending therethrough.

When ring **21** is pivoted downwardly to its locking position shown in FIGURES 2 and 3, locking pin **27** projects through opening **28** and between a pair of teeth in the row **14**. Slider **16** is thereby locked against movement so that zipper **11** will not be accidentally opened.

In order to stop the downward pivotal movement of ring **21** at its proper locking position, bracket **22** comprises a transverse element **29** extending perpendicular to elements **23, 24** and integral with the radially innermost ends of the latter. Downward pivotal movement of ring **21** is thus stopped at the position where transverse bracket element **29** abuts the front face **17*a*** of the forward wall **17** of slider **16**.

It will thus be seen that bracket **22** performs the triple function of mounting locking pin **27** at the proper radial distance from the pivotal axis of bearing **20**, preventing axial movement of ring **21** within bearing **20** so as to maintain locking pin **27** in proper position for projection through clearance opening **28**, and limiting the downward pivotal movement of ring **21** at its locking position. As a result, the advantages of the pin type of slider locking

arrangement may be utilized without sacrificing the advantages of the ring type of slider manipulattion means.

It is to be understood that the specific embodiment disclosed in the drawings and described above is merely illustrative of one of the many forms which the invention may take in practice without departing from the scope thereof as delineated in the appended claims and that the latter are to be construed as broadly as permitted by the prior art.

I claim:

**1.** In a slide fastener including a pair of stringers having mutually interengageable rows of teeth, a slider mounted thereon for engaging and disengaging the same comprising;

an annular ring having a relatively large opening therethrough adapted to receive one or more fingers of the hand for manual application of a substantial pulling force thereto,

means arranged on the front wall of said slider to which said ring is pivotally attached,

said ring having a peripheral segment rotatably mounted in said first means whereby said ring is pivotally attached to said slider,

means arranged integral with the interior peripheral surface of said ring adjacent said peripheral segment and extending radially inwardly therefrom and around said first means for positioning and limiting the movement of said ring relative thereto, and

a locking pin mounted on said second means and positioned radially inwardly of said ring and laterally of said peripheral mounted segment thereof,

the forward wall of said slider having an opening therein through which the locking pin is adapted to project into engagement with the teeth within said slider when in locking position,

said second means being constructed and arranged so that it is adapted to abut the outer surface of the forward wall of said slider and the said first means to limit the movement of the ring relative to said slider.

**2.** The combination as defined in claim **1**, wherein the second means comprises a substantially U-shaped bracket disposed within the ring having a transverse element extending perpendicular to and connecting the inner ends of a pair of spaced-apart radially extending elements arranged to either side of the first means, the opposite ends of said radially extending elements being arranged integral with the inner peripheral surface of said ring with said locking pin being positioned on one of said radially extending elements.

**3.** The combination as defined in claim **1**, wherein the second means comprises a bracket having a pair of elements circumferentially spaced along said ring on opposite sides of said first means and extending radially inwardly from the inner peripheral surface of the ring, said first means having opposite end faces each engageable with a respective one of said bracket elements to limit the axial



movement of said ring segment relative to said first means.

**4.** In a zipper construction including a pair of stringers having mutually interengageable rows of teeth and a slider reciprocally movable to interengage and disengage said rows of teeth, the improvement comprising;

an annular ring having an opening therethrough to receive one or more fingers of the hand for the manual application of substantial pulling force thereto,

means including a cylindrical bearing having an axis extending parallel to the plane of the stringers for pivotally mounting said ring on the forward wall of said slider,

said ring having a peripheral segment extending through and being rotatable within said cylindrical bearing about an axis spaced forwardly of the slider forward wall,

a bracket secured to said ring and extending into the opening thereof for limiting the movement of said ring, relative to said first means,

said bracket comprising a pair of elements circumferentially spaced along said ring on opposite sides of each first means, the latter having opposite end faces engageable with a respective one of said bracket elements to limit lateral movement of said ring segment within said bearing,

said bracket elements each having one end integral with the interior peripheral surface of the ring and extending radially inwardly therefrom,

a locking pin mounted on one of said bracket elements and adapted to extend through an opening of said forward wall and between a pair of teeth when in a locked position and which is responsive to pivotal movement of said ring to a locking position to lock said slider against movement and responsive to pivotal movement of said ring away from said locking position to unlock said slider so as to permit movement of the latter,

said locking pin being mounted on said bracket radially inwardly of said pivotal axis and laterally of said peripheral mounted segment of the ring.

**5.** A zipper construction as recited in claim **4**, wherein said bracket is substantially U-shaped and comprises a transverse element extending perpendicular to an joining the radially inner ends of said radial elements for abutting said slider forward wall to limit said pivotal movement of the ring to said locking position thereof.

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BERNARD A. GELAK, *Primary Examiner.*