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SLIDE FASTENER

Filed May 24, 1955

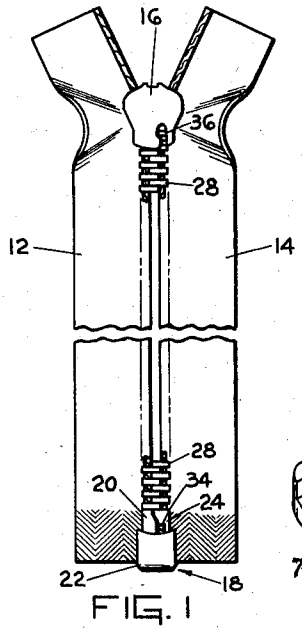


FIG. 1

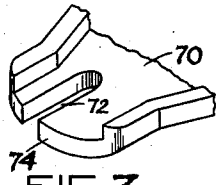


FIG. 7

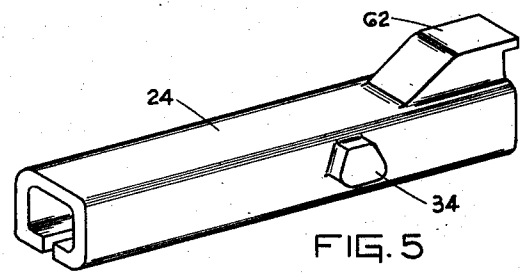


FIG. 5

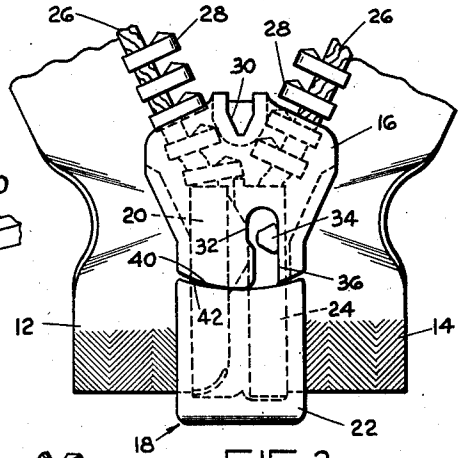


FIG. 2

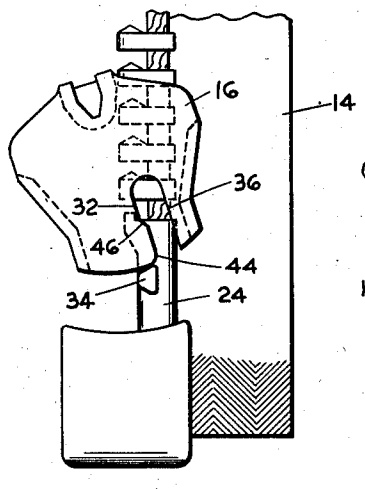


FIG. 4

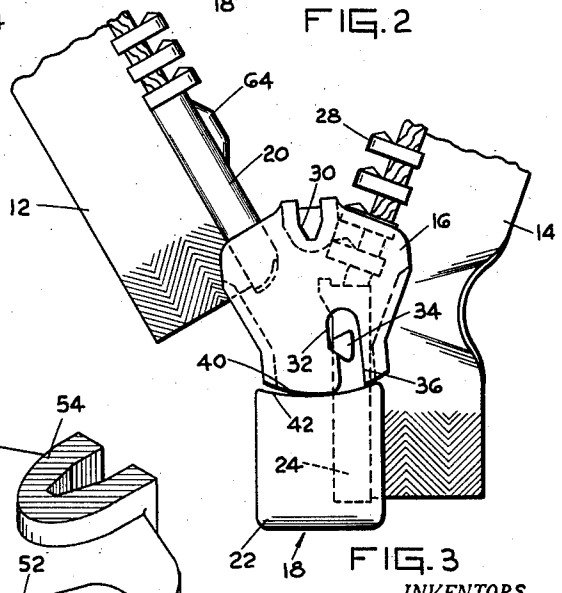


FIG. 3

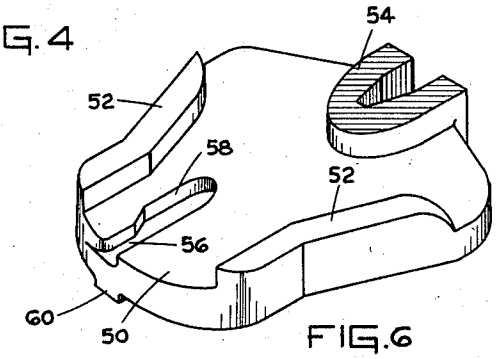


FIG. 6

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SLIDE FASTENER

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3 Claims. (Cl. 24—205.11)

This invention relates to slide fasteners, and more particularly to those having a separable bottom stop.

Fully separable slide fasteners are in wide use for coats, jackets and the like. They usually comprise a separable bottom stop including a socket portion on one stringer for receiving a pin on the other stringer. The slider remains on the stringer with the socket portion, and is freely movable therealong. It has been recognized that it would be desirable to anchor the slider at the socket when the fastener is separated, so that the slider is in proper position ready to receive the pin when rejoining the stringers.

In one prior suggestion the slider is locked to the socket portion by means of a positive lock. Insertion of the pin releases the lock and frees the slider. Such a construction has not proved satisfactory because it complicates the problem of the product manufacturer, typically a garment manufacturer, when sewing the stringer in the garment. The line of stitching is fairly close to the fastener elements or so-called "scoops," and there is danger of the sewing machine needle hitting the slider. The usual practice is to move the slider toward the upper end of the stringer while sewing the lower end, and to then move the slider back to the lower end while finishing the sewing of the upper end. This is not feasible when using a lock which is released solely by the pin, for the stringers are separated during the sewing operation.

Another suggestion has been the use of frictional means causing the slider to be received with a wedging or frictional grip when moved down to the bottom stop. However, this arrangement is unsatisfactory in use because the operation of the slider is "sticky" or difficult at the last part of its downward movement and the first part of its upward movement.

The primary object of the present invention is to generally improve separable slide fasteners, and to overcome the difficulties outlined above. A further object is to position or orient the slider properly about the longitudinal axis of the fastener, and about its perpendicular axis.

To accomplish the foregoing general objects, and other more specific objects which will hereinafter appear, our invention resides in the separable slide fastener elements, and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by a drawing, in which:

Fig. 1 is a rear view of a slide fastener embodying features of our invention;

Fig. 2 is a fragmentary rear view showing the separable bottom stop with the slider in lowermost position;

Fig. 3 is a similar view showing the tilting of the slider on removal of the pin;

Fig. 4 is a similar view showing how the slider may be intentionally moved away from or returned to the bottom stop despite the absence of the pin;

Fig. 5 is a perspective view showing the stud of the bottom stop;

Fig. 6 is a partially sectioned perspective view of one wing of a slider embodying the present invention in a slightly modified form; and

Fig. 7 is a fragmentary perspective view of a modification.

Referring to the drawing, and more particularly to Fig. 1, the fastener there shown comprises stringers **12** and **14**, the fastener elements or scoops **28** of which may be meshed or unmeshed by means of a slider **16**. The stringers are held together at their lower ends by means of a separable bottom stop generally designated **18**. In accordance with conventional practice this comprises a pin **20** at the lower end of stringer **12**, the said pin being removably inserted in a socket portion **22** secured at the lower end of stringer **14**. The separable bottom stop **18** may include a so-called "stud" **24**, to which a so-called "clip" **22** is secured, the latter providing the socket for the pin **20**. In most cases the pin and stud are generally comparable in length and diameter, but this is not necessary.

Referring now to Figs. 2 and 3 of the drawing, the stringers **12** and **14** may be conventional in comprising tapes formed with cords or beads **26** at their adjacent edges, these being either sewn to or woven integrally with the tapes. The fastener elements or scoops **28** have jaws which are clamped or cast about the beads **26**. The slider **16** has appropriate front and back walls or so-called "wings," with the usual edge flanges, and rigidly joined in spaced relation by a "diamond" or neck **30**. These form a branched or generally Y-shaped channel inside the slider.

Referring now to Fig. 3, it will be seen that when the stringer **12** and its pin **20** are removed from the bottom stop, the slider is tilted to a somewhat angular position by reason of the pressure of stringer **14** and its scoops **28** against the neck **30** of the slider. The stringer has a natural tendency to straighten, and this results in a cocking or tilting of the slider in counter-clockwise direction, as shown by the change from the upright position of Fig. 2 to the tilted position of Fig. 3.

The slider and bottom stop have mating detent parts **32** and **34** which engage when the slider is tilted as shown in Fig. 3, and which disengage when the slider is upright as shown in Fig. 2. From examination of Fig. 2 it will be seen that the insertion of the pin **20** into its socket portion or clip **22** serves to turn the slider in clockwise direction from the tilted position shown in Fig. 3 to the upright position shown in Fig. 2. This is so because the pin **20** together with the stud **24** occupy and substantially fill the entire space in the narrow or lower end of slider **16**.

The detent part **34** is a projection on one face, preferably the back face, of the stud **24**. The nature of this projection is best shown in Fig. 5. Reverting to Figs. 2 and 3, one wing, preferably the back wing of the slider, has an upright slot or groove **36**, dimensioned to receive and freely pass the detent **34**. However, this groove has an offset enlargement at its upper end, and this provides an undercut which acts as the detent part **32**, in contrast with the relatively straight or clear portion **36**.

The detent **34** moves freely through the clear portion **36** (Fig. 2) when the slider is moved down to the bottom stop. However, when the stringer **12** and pin **20** are removed as shown in Fig. 3, the ensuing tilt of the slider causes detent **34** to move into the undercut part **32**, thus retaining the slider in its lowermost position.

The lower or bottom end **40** of the slider is preferably made arcuate and convex downward, as shown. The top **42** of the socket portion or clip **22** is preferably arcuate and matingly concave. It will be observed that clip **22** is generally U-shaped with laterally spaced substantially coextensive opposite walls, the upper end of said walls being arcuate and matingly concave to the bottom end **40** of the slider. The radius of the arc preferably corre-

sponds to the center about which the slider tends to rock when the pin is removed. The convex curvature **40** facilitates tilting of the slider away from or back to its upright position, whereas this edge, if left straight, would inhibit tilting because the rocking action would necessitate a lift of the slider relative to the bottom stop. The mating curvature **42** is not essential but is desirable, for improved appearance and nesting of the parts.

Although the slider is normally retained in down position when the fastener is in use, it may be intentionally raised by deliberately turning it to upright or release position and then moving it away from the bottom stop until it is above the detent **34**, as shown in Fig. 4. This is of great advantage to the product manufacturer (for example a garment manufacturer), when sewing the fastener in place, for the slider may be deliberately moved toward one end of the stringer while sewing the other end, and then may be moved back to the sewn end while sewing the other end. Thus the slider is kept out of the way of the sewing machine needle.

If desired, this intentional release of the detent may be facilitated in several ways. One is to slope the top and bottom surfaces of detent **34** so that it has a trapezoidal shape instead of a rectangular shape. This is clearly shown in the drawing. The slope is in proper direction to facilitate entry and exit of the detent. Another is to slope the entrant portion of slot **36**, as shown at **44** in Fig. 4, and to slope the shoulder or undercut at the bottom of the enlargement **32**, as shown at **46**. If desired, both, that is the detent and the slider, may be sloped as here shown.

As so far described the slot **36** is cut entirely through the wing of the slider. However, if desired, a blind slot may be used, and this modification is shown in Fig. 6, in which the back wing **50** of the slider is generally similar to conventional sliders and to that previously described in having flanges or rails **52** and a diamond or neck **54**. It further has a clear slot or groove **56**, and an offset enlargement or undercut portion **58**. However, in this case the slot or groove is formed by a coining operation, thus leaving covering metal at **60**.

Apart from holding the slider at the bottom stop, the present improvement has additional benefits in helping maintain proper orientation of the slider with respect to the socket. In one aspect, this refers to orientation about an axis perpendicular to the fastener tapes and passing through the slider. In another aspect, this refers to the longitudinal axis of the fastener, or, more specifically, the axis of the stud.

Referring to the drawing, the tilt of the slider shown in Figs. 3 and 4 is not nearly as great as may occur, in the absence of the present improvement. The slider may turn further until the lower end of the left flange reaches the stud. At that time the tilt is so great that someone seeking hastily or carelessly to assembly the stringers may pass the pin **20** through the upper corner of the slider outside the flange, and the pin may then pass alongside both the slider and the socket. The difficulty is aggravated with a slider in which the flange is shortened at its upper end.

It will be evident from inspection of Fig. 3 that the tilting or turning of the slider is limited to a small amount, thus guarding against passage of pin **20** alongside of instead of through the slider.

In respect to orientation of the slider about the longitudinal axis of the fastener, it is common practice to make the stud rectangular in cross-section, as shown in Fig. 5, but even with this precaution it has been found that on occasion a user may insert the pin through the slider while at the same time twisting the slider about the stud to an angle which hinders the pin from entering the socket. The projection **34** received in the slot **36** helps limit this change of orientation.

If desired, the "orientation" function of the invention may be enhanced, while at the same time slightly sacrificing the "locating" function of the invention, and a modification for this purpose may be described with reference to Fig. 7 of the drawing. That figure shows the lower end of the back wing of the slider, and it will be noted that, as before, the wing **70** has a slot or groove **72** which starts at the lower edge **74** of the slider. The arrangement is such that the projection **34** (Figs. 1–5) on the stud **24** enters the slot or groove **72** when the slider is at the bottom stop, and this prevents turning of the slider about an axis perpendicular to the tapes, and it also limits turning of the slider about the axis of the stud.

The slot or groove **72** differs from that previously described in that it is not enlarged at its upper end to provide an undercut portion. Nevertheless, even the arrangement of Fig. 7 fulfills a locating function because the detent bears against one side of the groove when the slider is urged to tilt, as previously described, and this helps hold the slider against moving away from the socket, although the holding action in this case is frictional and therefore somewhat less positive. The slot or groove **72** may have a width only slightly greater than the width of the projection or detent **34**, and thus the orientation function is improved.

It will be understood that while we have described the orienting and detent mechanism as being located preferably on the back of the slider, this is done merely for convenience in not unnecessarily interfering with the conventional lug and the slider locking mechanism frequently found on the front side of the slider. Apart from that there is no reason why the orienting and detent means might not equally well be provided on the front of the slider, or for that matter, simultaneously on both the front and back of the slider.

If desired, the bottom stop may be provided with customary anti-mismesh means. In the present case this consists of a bump **62** (Fig. 5) on stud **24**, and a bump **64** (Fig. 3) on pin **20**. One advantage of our orienting and detent mechanism is that it does not in any way interfere with conventional anti-mismesh means.

It is believed that the construction and method of use of our improved separable slide fastener, as well as the advantages thereof, will be apparent from the foregoing detailed description. It will also be apparent that while we have shown and described our invention in several preferred forms, changes may be made in the structures shown without departing from the scope of the invention, as sought to be defined in the following claims.

We claim:

1. A fastener having a separable bottom stop including a pin and socket portion, comprising a first stringer having the pin of said separable bottom stop, a second stringer having the socket portion of said separable bottom stop to receive the aforesaid pin, said socket portion comprising a stud and a clip at the lower half of the stud to form a socket for receiving the pin in collateral relation to the stud, said clip having laterally spaced substantially coextensive opposite walls, a slider on the second stringer, said slider having a neck and being tilted to angular position by pressure of the second stringer on the neck when the first stringer and pin are removed, and means to retain the slider at the socket when the fastener is separated, said means comprising a detent projection on one face of the upper half of the stud, there being an upright groove in one wing of the slider, said groove having a clear portion and an undercut portion at its upper end, the arrangement being such that the detent enters the undercut portion when the slider is tilted, but is aligned with the clear portion when the slider is upright, said pin when inserted in said socket serving to turn the slider from tilted to upright position, thereby freeing the slider for upward movement, the lower end of said slider being arcuate and convex downward, and the upper end of said clip walls being arcuate and matingly concave in order

to facilitate tilting of the slider away from or back to upright position.

2. A fastener having a separable bottom stop including a pin and socket portion, comprising a first stringer having the pin of said separable bottom stop, a second stringer having the socket portion of said separable bottom stop to receive the aforesaid pin, said socket portion comprising a stud and a clip at the lower half of the stud to form a socket for receiving the pin in collateral relation to the stud, said clip having laterally spaced substantially coextensive opposite walls, a slider on the second stringer, said slider having a neck and being tilted to angular position by pressure of the second stringer on the neck when the first stringer and pin are removed, and means to retain the slider at the socket when the fastener is separated, said means comprising a detent projection on one face of the upper half of the stud, there being an upright groove in one wing of the slider, said groove having a clear portion and an undercut portion at its upper end, the arrangement being such that the detent enters the undercut portion when the slider is tilted, but is aligned with the clear portion when the slider is upright, said pin when inserted in said socket serving to turn the slider from tilted to upright position, thereby freeing the slider for upward movement, the top and bottom of said detent having sloping surfaces, to facilitate intentional movement of the slider away from the back to the socket portion while the fastener is separated, thereby facilitating sewing of the second stringer in a garment or the like, the lower end of said slider being arcuate and convex downward, and the upper end of said clip walls being arcuate and matingly concave in order to facilitate tilting of the slider away from or back to upright position.

3. A fastener having a separable bottom stop including a pin and socket portion, comprising a first stringer having the pin of said separable bottom stop, a second stringer having the socket portion of said separable bottom stop to receive the aforesaid pin, said socket portion comprising a stud having a length and diameter generally comparable to the pin, and a clip which is generally U-shaped with laterally spaced substantially coextensive opposite walls, said clip being secured to the

lower half of the stud to form a socket for receiving the pin in collateral relation to the stud, a slider on the second stringer, said slider having a neck and being tilted to angular position by pressure of the second stringer on the neck when the first stringer and pin are removed, and means to retain the slider at the socket when the fastener is separated, said means comprising a detent projection on the back face of the upper half of the stud, there being an upright groove in the back wing of the slider starting at the lower edge thereof, said groove having a clear portion and an undercut portion at its upper end, the arrangement being such that the detent enters the undercut portion when the slider is tilted, but is aligned with the clear portion when the slider is upright, said pin when inserted in said socket serving to turn the slider from tilted to upright position, thereby freeing the slider for upward movement, the top and bottom of said detent projection having sloping surfaces, and the entrant portion of the slot and the exit portion of the undercut having correspondingly sloping surfaces, to facilitate intentional movement of the slider away from and back to the socket portion while the fastener is separated, thereby facilitating sewing of the second stringer in a garment or the like, the lower end of said slider being arcuate and convex downward, and the upper end of said clip walls being arcuate and matingly concave in order to facilitate tilting of the slider away from or back to upright position.

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