Nov. 9, 1971 H. HANSEN 3,618,178

SEPARABLE SLIDE FASTENER

Filed May 22, 1970 2 Sheets-Sheet 1

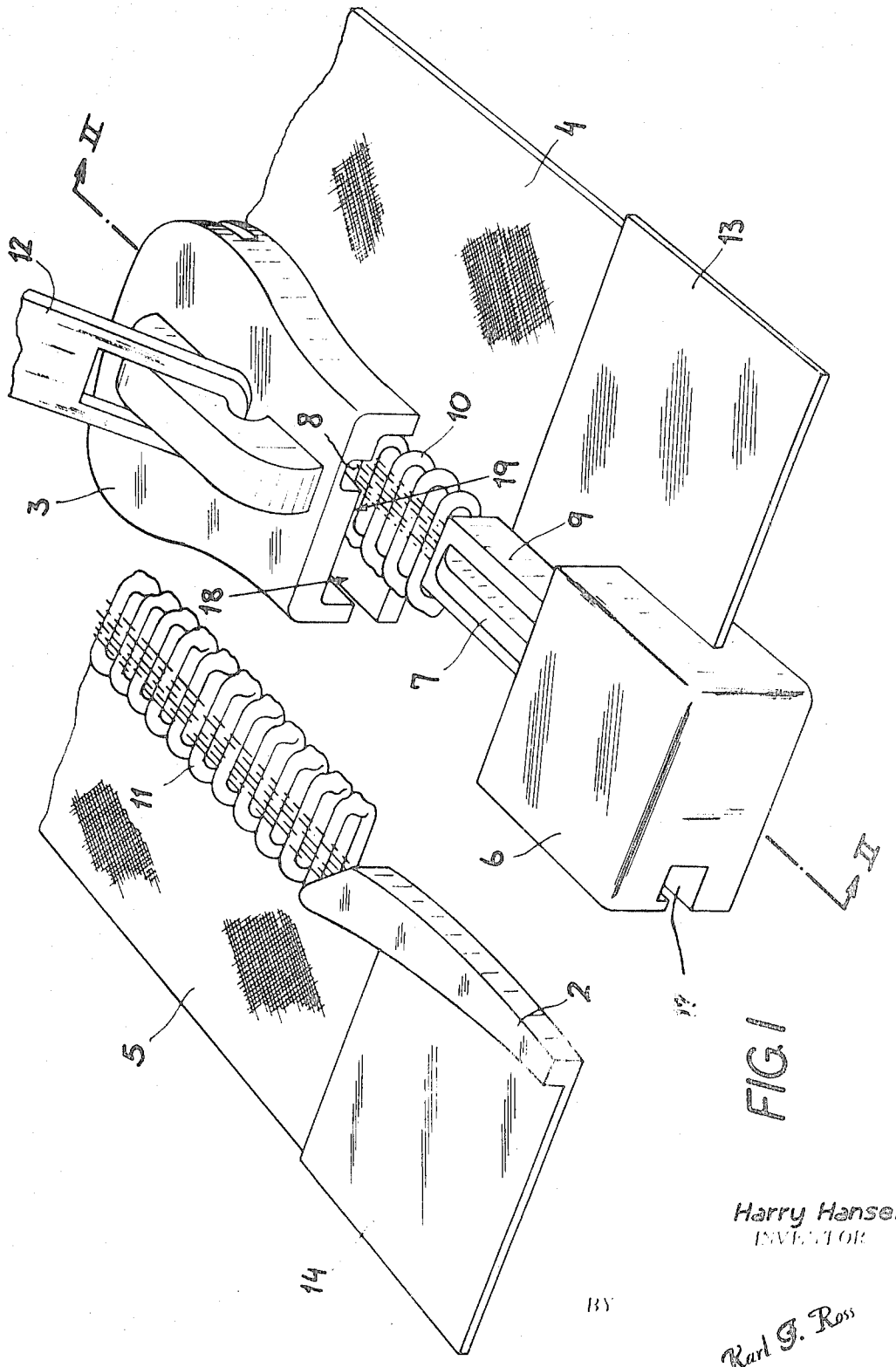


FIG 1

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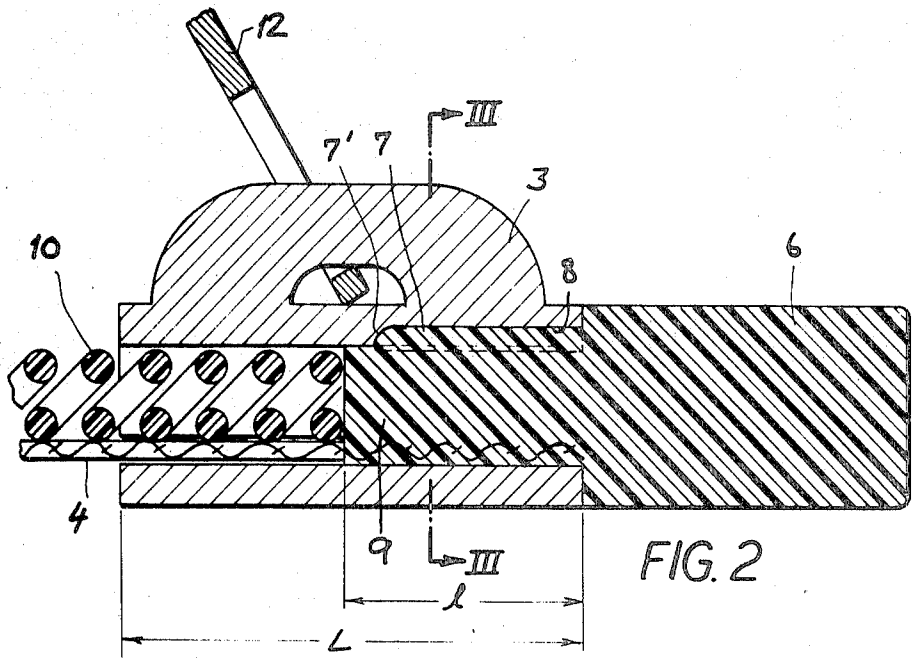


FIG. 2

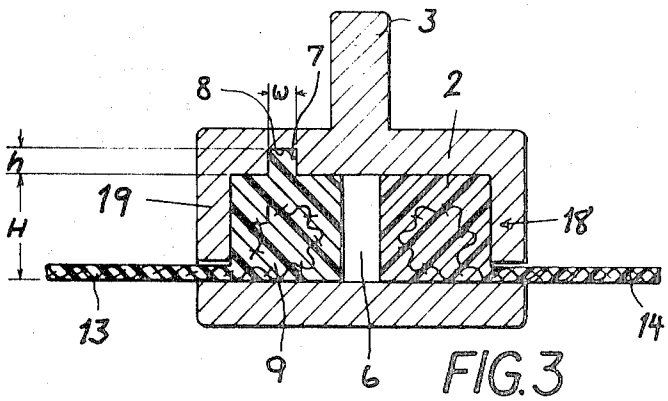


FIG. 3

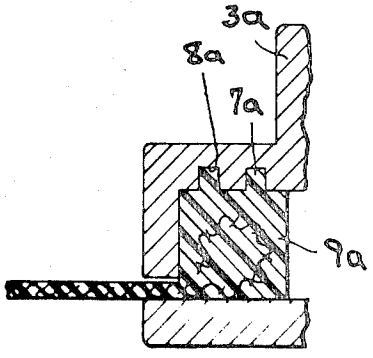


FIG. 4

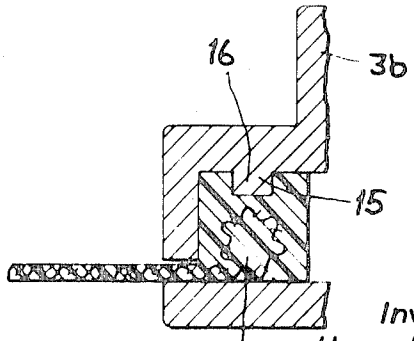


FIG. 5

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3,618,178

SEPARABLE SLIDE FASTENER

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Continuation-in-part of application Ser. No. 730,409, May 20, 1968. This application May 22, 1970, Ser. No. 39,629

Int. Cl. A44b *19/12, 19/38*

U.S. Cl. 24—205.11 F 7 Claims

ABSTRACT OF THE DISCLOSURE

A separable slide fastener has at its starting end an insert block with a ribbed protrusion which snugly mates with a grooved passage in a slider to hold the two relative to each other in an ideal aligned fastening position. The protrusion extends about halfway into the slider and prevents this slider from twisting around or becoming cocked on the protrusion.

This is a continuation-in-part of application Ser. No. 730,409, filed May 20, 1968, now abandoned.

My invention relates to a separable slide fastener having two slide-fastener halves mutually attachable by means of interlockable coupling elements terminating in end-stop members and having a slider for joining these coupling elements.

Customarily such a fastener is united prior to closing by passing a plug attached to one of the ends of one of the coupling elements through a passage in a slider mounted on the other element and then fitting it into a recess in an insert block serving as end-stop member on the element bearing the slider, whereupon the slider is simply drawn along the silde fastener thereby closing it.

These prior-art devices present a difficulty in lining up the slider passage with the insert-block recess of one slide-fastener half before fitting the plug of the other half into them. While the insert block may have a projection which enters the slider passage, it generally does not prevent the slider from rotating about the coupling element (canting) or tilting at an angle thereto. The best of these devices still requires the exercise of extreme care in setting the passage of the slider in line with the recess of the insert block for drawing the slider and thereby closing the slide fastener.

Another problem which is particularly apparent in nylon slide fasteners is that because of the natural elasticity of the coupling element the end stop on the fastener half carrying the slider has a tendency to twist relative to the fastener axis. In order to close the fastener it is, therefore, necessary to hold this member straight while fitting the other elements together.

It is an object of my invention to provide a separable slide fastener wherein the slider passage is easily and simply aligned with the insert-block recess.

This object and other are obtainable, in accordance with my invention, by providing an insert-block protrusion with a rib that snugly fits a corresponding groove in a wall of the slider passage to hold the two in an ideal fastening position. In this way the slider need only be drawn to abut the insert block so that the rib wedges into the groove thereby fixing the two relative to each other. In this position the plug of the other slide-fastener half is easily slipped through the slider and into the recess of the insert block.

According to a feature of the present invention the rib and protrusion extend around halfway through the slider, and the rib is of a height above the protrusion equal to around one-fourth of the protrusion thickness. In this manner the slider is engaged through a good part of its

length so that it is very firmly held. Furthermore, it becomes difficult to break free the protrusion, a common occurrence on prior-art fasteners of this type, due to the long lever arm of the protrusion in the slider.

Of course, the rib can be provided on the slider and the groove on the insert-block protrusion, or a plurality of ribs could be provided on one or the other; indeed, any of a number of alternative formations for aligning the slider with the insert block is possible.

This object and others of my invention will now be described with reference to the drawing in which:

FIG. 1 is an enlarged perspective view of the starting end of a separable slide fastener according to my invention;

FIG. 2 is a section taken along line II—II of FIG. 1, with the slider abutting the insert block;

FIG. 3 is a cross section taken along line III—III of FIG. 2; and

FIGS. 4 and 5 are sections similar to that of FIG. 3, of two other embodiments of my invention.

According to FIGS. 1 to 3 a separable slide fastener has two support tapes **4** and **5** on which are mounted mutually interlockable coupling elements **10** and **11** respectively. Coupling element **10** passes through a passage **19** (FIGS. 1 and 3) in a slider **3** with a tongue **12** and terminates in a protrusion **9** on an end-stop insert block **6** with a recess **17**. Block **6** and protrusion **9** are affixed to a stiffened end **13** of the tape **4**. Coupling element **11** terminates in a plug **2** adapted to pass through a passage **18** (FIGS. 1 and 3) in the slider **3** and to fit into the recess **17** of the insert block **6**. The plug **2** is also affixed to a stiffened tape end **14** similar to end **13**. The slide fastener shown here is made of synthetic resin so that on a finished fastener the block **6**, protrusion **9**, coupling element **10**, and end **13** are all molded into one piece as are element **11**, plug **2** and end **14**.

The protruding lock **9** is of polygonal cross section and is provided with a longitudinal rib **7**, and the slider **3** is provided with a corresponding longitudinal groove **8**. In this way, when the slider **3** is drawn to abut the insert block **6**, the position shown in FIGS. 2 and 3, the groove **8** and the rib **7** mutually engage and hold the two relative to each other. The only motion the slider **3** can make in this position is an axial one away from the block **6** thereby disengaging the groove **8** and the rib **7** as seen in FIG. 1. In the engaged position of FIGS. 2 and 3 the plug **2** can easily be led through the passage **18** in the slider **3** and into the recess **17** in the insert block **6** whereupon the slider **3** can be drawn up away from the block **6** and the slide fastener closed.

FIG. 2 shows that the slider **3** has an overall length L which equals to a critical value of substantially twice the length *l* of the protrusion **9**, which is only slightly longer than the rib **7**. This extension of the protrusion **9** well into the slider **3** makes for an extremely firm connection between the two. Similarly, the rib **7** has a height H which, according to a most important feature of this invention, is between one-third and one-fourth of the height H of the protrusion **9**, so that the resistance which this rib can offer to canting i.e. rotation of the slider **3** about the axis of the protrusion **9**, of the slider **3** is sufficient. The rib **7** also tapers inwardly and downwardly away from the member **6**, and the groove **8** is formed accordingly to actually wedge the two together when the slider **3** abuts the member **6**. Indeed, with the slide fastener shown in FIGS. 1–3 there is no need to hold the slider **3** and member **6** together once they have been engaged, as in prior-art fasteners, since once they are united it takes a definite exertion of force to separate them. In the case of a nylon fastener, as here, the natural elasticity of the elements makes this wedging action very effective. In other words, I have found, most surprisingly, that with a nylon fastener,

i.e. wherein the mating endstop members are composed of nylon, and the slider is metal or nylon, the forward end of the rib **7** terminates at **7** in a radius, has a height H of one-third to one-fourth the height H of the protrusion, a width *w* of ½ to ¼ of the width of the protrusion, both rib and protrusion are geometrically similar and of rectangular section and the corresponding dimensions of the slider-body socket for both rib and protrusion are slightly smaller (i.e. about 0.5 to 5%) than those of the rib and protrusion, the latter are resiliently compressed to retain the slider elastically and yet permit extraction of the slider thereafter. Canting, as defined above, is totally precluded.

FIG. 4 shows a second embodiment of my invention. Here an insert-block protrusion **9***a* has two ribs **7***a* mating with two grooves **8***a* in a slider **3***a*. This arrangement offers increased insurance against axial twisting or tilting of the slider **3***a* in relation to the insert block.

FIG. 5 shows a third embodiment where, instead of a grooved slider **3** or **3***a* as in the previous embodiments, a slider **3***b* having a rib **15** is used in cooperation with an insert-block protrusion **9***b* having a groove **16**. This slider **3***b* would be stronger since it is not weakened by a groove. Thus this embodiment could be deemed preferable for certain slide fasteners although it is only usable with fasteners having a very flat coupling element since with a thick element the rib **15** would engage therein.

The improvement described and illustrated is believed to admit of many modifications within the ability of persons skilled in the art, all such modifications being considered within the spirit and scope of the invention except as limited by the appended claims.

I claim:

1. A separable slide fastener comprising:

a slider having a slider body;

a pair of elongated coupling elements mutually interlockable by longitudinal displacement of said slider therealong;

a plug at one end of said elements;

an insert block at the corresponding end of the other of said elements and formed with a recess adapted to receive said plug;

an elongated protruding body of polygonal cross section formed on said insert block directly in line with said other of said elements and snugly receivable in said slider body in a condition of said slider body abutting said block, said protruding body being substantially half as long as said slider body, said protruding body and said block being of an elastically deformable synthetic resin; and

a rib formed on one of said bodies having a length of the order of half that of said slider body and being in line with said other element, the other body being formed with a groove snugly receiving said rib in said abutting condition of said slider and block.

2. The fastener defined in claim **1** wherein said rib is formed in said slider body.

3. The fastener defined in claim **2** wherein said groove has a height equal to between one-third and one-fourth of the height of said protruding body.

4. The fastener defined in claim **3** wherein said insert block and said protruding body are made of nylon.

5. The fastener defined in claim **4** wherein said protruding body is of generally square cross section.

6. The fastener defined in claim **5** wherein said rib is of rectangular cross section with a width equal to about ¼ to ½ that of said protrusion and is substantially centered on a face thereof while terminating in a radius short of the end of said protrusion.

7. The fastener defined in claim **6** wherein said slider body has a socket portion complementarily receiving said protrusion and said rib, with internal dimensions 0.5 to 5% smaller than the corresponding dimensions of said rib and said protrusion.

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BERNARD A. GELAK, Primary Examiner

U.S. Cl. X.R.

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