United States Patent [19]

Cuckson et al.

[11] **3,757,391**

[45] **Sept. 11, 1973**

[54] **SLIDE FASTENER OF THE INVISIBLE TYPE**

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[73] Assignee: **Scovill Manufacturing Company**, Waterbury, Conn.

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[52] **U.S. Cl. 24/205.1 R**, 24/205.13 D, 24/205.15 R

[51] **Int. Cl.** **A44b 19/32**, A44b 19/04

[58] **Field of Search** ..... 24/205.1 C, 205.1 R, 24/205.13 D

[56] **References Cited**

UNITED STATES PATENTS

3,026,589 3/1962 Sperry ..... 24/205.1 R

3,414,948 12/1968 Cuckson ..... 24/205.13 D

Primary Examiner—Bernard A. Gelak

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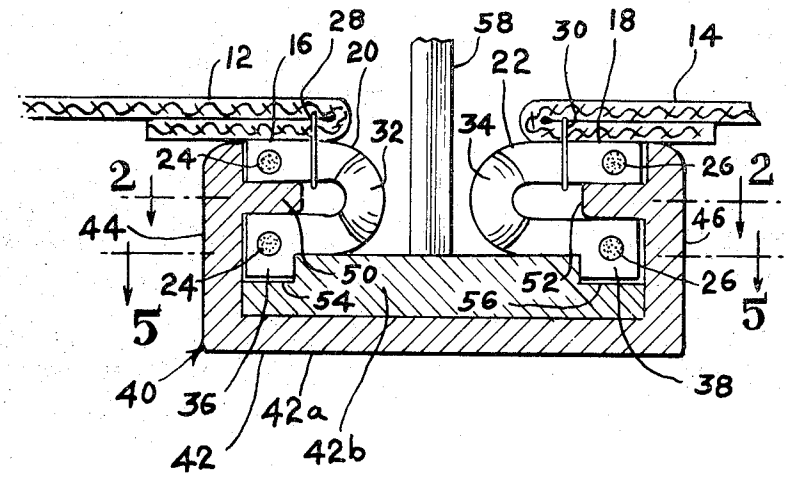
[57] **ABSTRACT**

Slide fastener slider has groove means cooperating with flanges on individual slide fastener elements to hold the lines of fastener elements away from the slider pull, obviating wear. Additionally, slider is held in place on fastener elements by its engagement in outward openings of U-shaped fastener elements avoiding contact of slider with fabric, also obviating wear.

8 Claims, 7 Drawing Figures



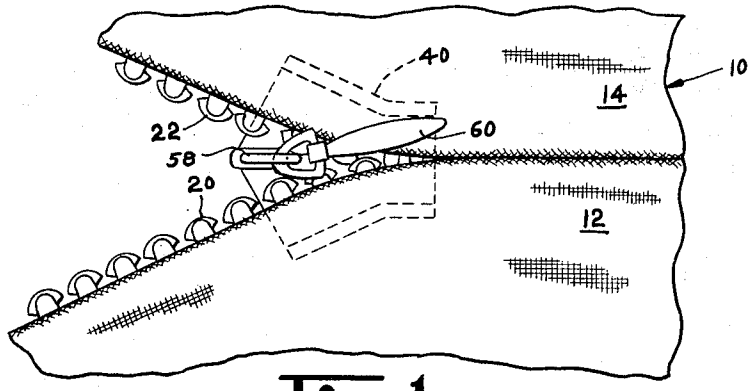


Fig. 1.

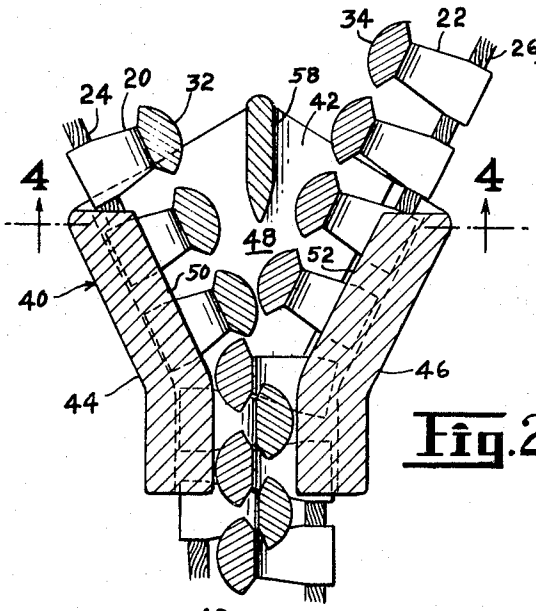


Fig. 2.

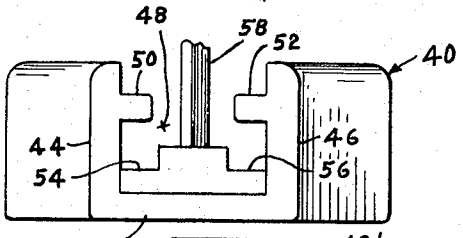


Fig. 3.

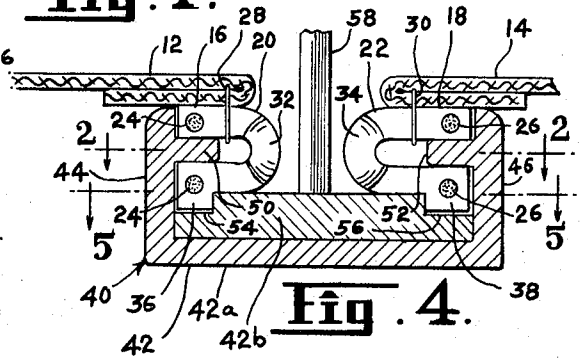


Fig. 4.

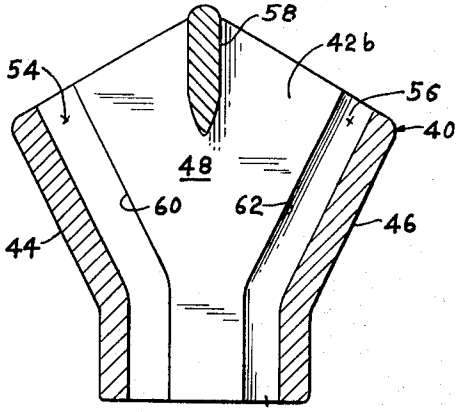


Fig. 5.

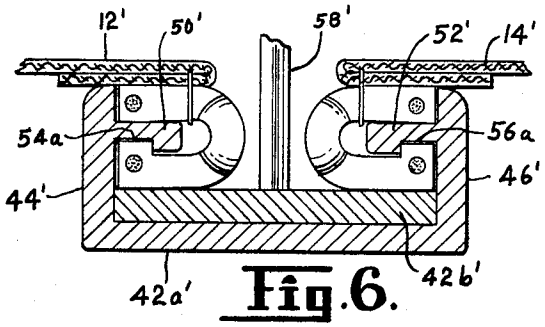


Fig. 6.

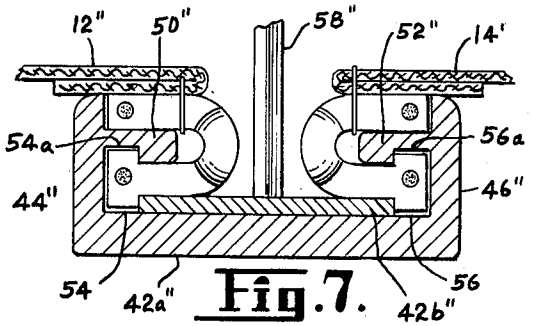


Fig. 7.

SLIDE FASTENER OF THE INVISIBLE TYPE

This invention relates to a slide fastener of the invisible type.

In the prior art, there have been a number of patents covering slide fastener structures wherein the lines of fastener elements were disposed on the underside of the tape when viewed from the outside of the garment so that when the slide fastener is closed, there is presented what only appears to be a seam, and no teeth, scoops, or other fastener structure is apparent. While the prior structures have been acceptable with respect to performance, for the most part, their life has been limited by the wearing of the fastener slider as it is moved along its traverse against the fabric of the fastener tapes, the garment itself, or the stitches which fastened the fastener elements to the tape or garment. This wearing has often resulted in the failure of the slide fastener, but at the very minimum, has increased the friction and made more difficult the operation of the fastener.

It is an object of the present invention, in an invisible fastener to so structure the slide fastener parts that the slider itself engages only the plastic fastening elements, and neither engages the stitches holding the elements to the tape, the tape, nor the garment fabric itself. This is accomplished by the unique structure of the slider combined with the unique structure of the fastener elements.

Other objects and features of the invention will be apparent from the following specification including the drawings, all of which disclose a non-limiting form of the invention. In the drawings:

FIG. 1 is a top plan view of a slide fastener embodying the invention and showing the slider in phantom;

FIG. 2 is a greatly enlarged sectional view of a slider embodying the invention;

FIG. 3 is a rear end view of the slider;

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 2;

FIG. 5 is a sectional view taken on the line 5—5 of FIG. 4; and

FIGS. 6 and 7 are modified forms of a slider similar to the view shown in FIG. 4.

Referring more specifically to the drawings, a slider embodying the invention is generally designated **10** in FIG. 1. It comprises a pair of webs **12** and **14** of fabric which may be either the fabric or a garment itself, for instance, or the regular slide fastener tape.

As shown in FIG. 4, the fabric of the web adjacent the margin is turned under and folds back to present attaching surfaces **16, 18.** The fastening elements of the slide fastener embodying the invention are of the ladder type, and comprise a pair of lines **20, 22** attached respectively to the surfaces **16, 18,** as shown in FIG. 4. The fastener elements in each line are U shaped and the ends are joined respectively by a pair of cords **24** and **26,** similar to those shown in the U. S. Pat. No. 3,414,948 to Eric Cuckson and Arthur Jones. As shown, a line of stitching **28, 30** secures the lines of fasteners respectively to the attaching surfaces **16** and **18** with the heads **32, 34** facing each other.

As shown, the legs of each of the fastening elements more remote from the attaching surfaces **16, 18** are enlarged as at **36, 38** in a direction perpendicular to the adjacent cord **24, 26** for reasons which will appear.

The slider **40** used in the invention comprises a housing having a connected bottom **42,** side flanks **44, 46,** and a Y-shaped throat **48.** Flanges **50, 52** extend inward from the flanks **44** and **46.** The top of the slider is open, as shown in FIG. **4,** and permits passage of the tops of the fastener elements and the stitches **28, 30,** as shown. As shown best in FIG. **4,** groove means **54, 56** are formed in the bottom **42** of the slider adjacent the flanks **44, 46** and flare outwardly as shown in FIG. **5,** to complement the Y shape of the throat **48.**

Extending upwardly from the bottom **42** of the slider at the front end thereof is a post **58** to which is attached the slider pull tab **60** (FIG. **1**).

In practice, the slider may be made of two die-cast parts, one comprising the lower part **42***a* of the bottom, the side flanks **44** and **46,** and the flanges **50, 52,** the other comprising the raised floor **42***b* which is secured to the lower floor **42***a* as by welding, and the upwardly extending post **58.**

In use, it will be seen that the slider **40** is installed on the lines of slide fastener elements with the tongues or flanges **50, 52** extending inward of the opening of the U of each of the fastener elements. This secures the slider to the lines of fasteners without the need for the wrapping of the side flanks around the top of the fastener elements and around portions of the fabric. Thus, the connection between the slider and the lines of fastener elements is made irrespective of the thickness of the fabric, and as the slider moves, there is no wearing of the slider against the fabric.

Additionally, it will appear that the groove means **54, 56** receive the enlargements **36, 38** on the outward legs of the U-shaped element and the abutment of the inwardly facing shoulders **60, 62** against the outwardly facing ledges in the bottom part **42***b* hold the slide fastener lines out against the flanks **44, 46** of the slider. There is thus no need for the post **58** to hold the elements out against the flanks in the conventional manner. Because of this, as is best shown in FIG. **1,** there is no contact between the post **58** and either the fabric layers **12, 14** or the heads **32,34** of the fastener elements. FIGS. **6** and **7** show modified forms of the invention in which the groove means **54, 56** may take the form of grooves in the flange **54***a*, **56***a* in FIG. **6,** or both the flange and the bottom as at **54***a*, **56***a*, **54, 56.** In the modification of FIG. **6,** the primed form of the referenced numeral from FIG. **4** is used to designate corresponding parts and in the modified form of FIG. **7,** the double primed form of the referenced numeral is used to designate corresponding parts to those in FIG. **4.**

It will thus be seen that under the present invention the slider contacts only the plastic parts of the U-shaped slide fastener elements. The flanks of the slider do not contact the fabric, nor does the post **58** contact the fabric. There is thus not only greatly improved operability of the slider but there is also less chance of wear of the stitches of the fabric of the tape, or garment, and the operability of the slider does not depend to any extent on the thickness of the fabric of the garment or tape.

While I have described the invention in a few forms, it is susceptible of many changes and the invention may be described by the following claim language:

We claim:

1. A slide fastener of the invisible-type comprising:

a. a pair of coplanar side-by-side fabric webs with an opening to be closed between them;

b. a pair of lines of ladder-type fastener elements each including a series of spaced U-shaped elements having their ends attached to and held in uniform spaced relation by a pair of cords each running the length of the line, each of said U-shaped elements having a central fastening head and an enlargement at at least one of its ends, the enlargement extending outward in a direction perpendicular to the adjacent cord, the surfaces of the fabric of the webs to be on the outside of the opening being turned under at the opening and doubled back to present a flat attaching surface on the inside of the opening, the lines being stitched respectively to the attaching surface of the fabric webs adjacent the opening with the heads of the elements facing each other;

c. a slider comprising a housing having connecting bottom and side flanks, and a Y-shaped throat receiving the lines of elements, the housing having an open top and flanges extending inward from the side flanks into the U-shaped elements, and groove means in the slider to accommodate and engage the said enlargements, the groove means flaring outwardly to complement the shape of the Y-shaped throat, the housing having an upward post extending up from the center line of the bottom adjacent the wider end of the Y-shaped throat

whereby the groove means and enlargements serve to hold the elements and the webs away from the post and thereby reduce wear on the fabric.

2. A slide fastener as claimed in claim **1** wherein the groove means is in the upper surface of the bottom of the slider and the enlargements ride in the groove means.

3. A slide fastener as claimed in claim **2** wherein the flanks of the slider terminate short of the webs.

4. A slide fastener as claimed in claim **1** wherein the groove means have outwardly facing vertical shoulders inward from the flanks against which the enlargements abut.

5. A slide fastener as claimed in claim **1** wherein the enlargements extend outward on both sides of the leg of each U-shaped fastener that is more remote from the attaching surface and the groove means is formed in both the bottom and the flanges.

6. A slide fastener as claimed in claim **1** wherein the enlargements outward on the upward side of the leg of each U-shaped fastening element that is more remote from the attaching surface and the groove means is only in the underside of the flanges.

7. A slide fastener of the invisible-type comprising:

a. a pair of coplanar side-by-side fabric webs with an opening to be closed between them;

b. a pair of lines of ladder-type fastener elements each including a series of spaced U-shaped elements having their ends attached to and held in uniform spaced relation by a pair of cords each running the length of the line, each of said U-shaped elements having a central fastening head, the surfaces of the fabric of the webs adjacent the opening being turned under at the opening and doubled back to present a flat attaching surface on the inside of the opening, the lines being stitched respectively to the attaching surface of the fabric webs adjacent the opening with the heads of the elements facing each other;

c. a slider comprising a housing having connecting bottom and side flanks, and a Y-shaped throat receiving the lines of elements, the housing having an open top and flanges extending inward from the side flanks into the U-shaped elements, the flanks stopping short of the fabric, the housing having an upward post extending up from the center line of the bottom adjacent the wider end of the Y-shaped throat

whereby the flanks do not embrace the fabric and the operability of the slider is not dependent on the weight of the fabric, and the slider does not wear the fabric.

8. An article having a slide fastener closure therein comprising:

a. a pair of aligned intermeshing lines of plastic fastener elements, each element being of U shape and comprising a pair of legs and a connecting bight with interengaging means at the bights, the interengaging means of one line interengaging the interengaging means of the other line, each line of fastener elements having a pair of cords respectively connecting the ends of the corresponding legs of the elements to space the elements accurately, the openings of the lines of U-shaped elements facing in opposite directions respectively outward of the lines;

b. flexible panels areas in the article on opposite margins of an opening, the lines of plastic fastener elements having the legs along one side secured against and to the article on opposite margins respectively of the opening by lines of stitching, the lines of stitching extending into the material of the article and snugly around the leg of each fastener element more proximate the material, at least one of the lines of fastener elements being secured directly to a panel area of the article itself without the customary intermediate slide fastener tape; and

c. a slider comprising a housing having connecting top and side flanks, and a Y-shaped throat receiving the lines of elements, the housing having an open bottom for passage of the lines of stitching, and flanges extending into and being slideable respectively in the openings of the lines of fastener elements;

whereby the slider engages only the plastic of the lines of fastener elements without engaging the panels of the article and whereby the dimensions of the parts of the surfaces engaged by the slider is not a function of the thickness of the material of the panel.

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