United States Patent [19]

Thaeler

[11] **3,793,683**

[45] **Feb. 26, 1974**

[54] **ADHESIVE INSTALLED SLIDE FASTENER**

[75] Inventor: **Bruce K. Thaeler,** Meadville, Pa.

[73] Assignee: **Textron Inc.,** Providence, R.I.

[22] Filed: **July 18, 1972**

[21] Appl. No.: **272,999**

[52] **U.S. Cl.**..... **24/205.1 R,** 24/205.16 R, 156/66, 161/110, 161/148, 2/265

[51] **Int. Cl.**..... **A44b 19/34**

[58] **Field of Search**..... 24/205.1, 205.1 C, 205.16, 24/205.16 C; 161/147, 148, 51, 52, 110, 48; 156/66; 2/265, 234; 36/50, 7.3

[56] **References Cited**

UNITED STATES PATENTS

2,768,922	10/1956	Klein	24/205.16 R
3,561,073	2/1971	Rosser	24/205.1 R
3,575,750	4/1971	Sakamoto	156/66

Primary Examiner—Bernard A. Gelak

[57] **ABSTRACT**

A slide fastener having a single strip of adhesive on each carrier tape is bonded directly to each folded seam allowance at a garment opening and to each main fabric section adjacent the opening. A thermoplastic adhesive permits permanent installation of the slide fastener by means of an iron without the use of stitching threads.

14 Claims, 23 Drawing Figures

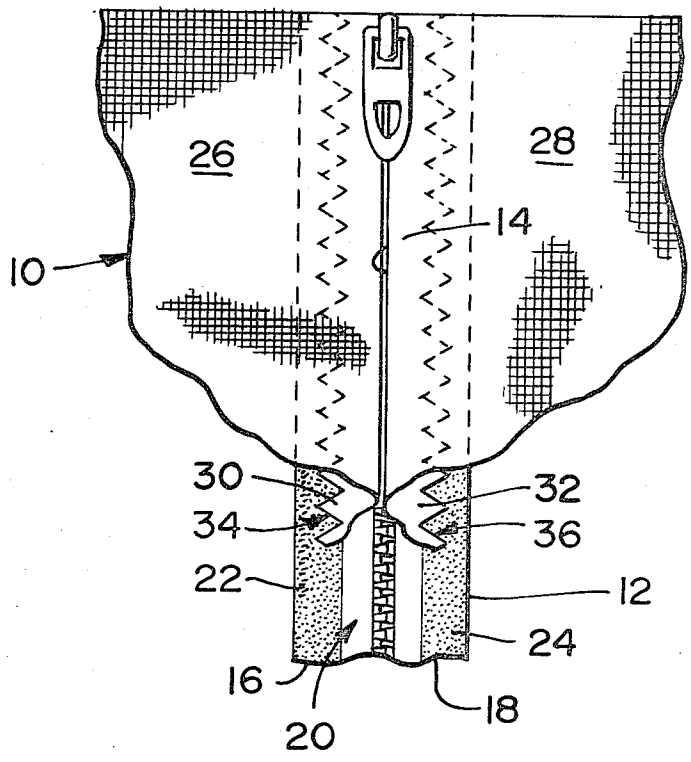


FIG. 1

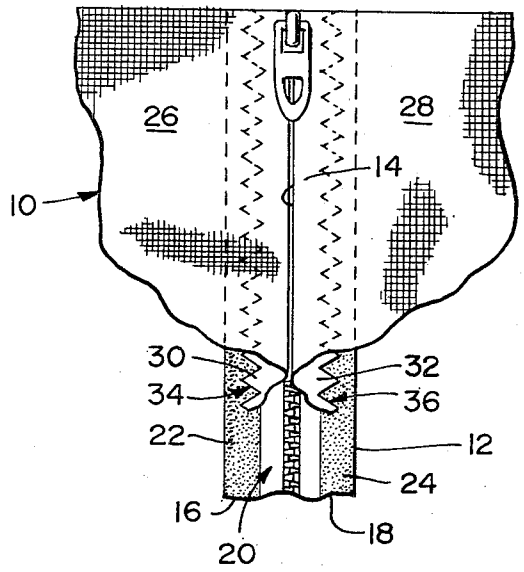


FIG. 2

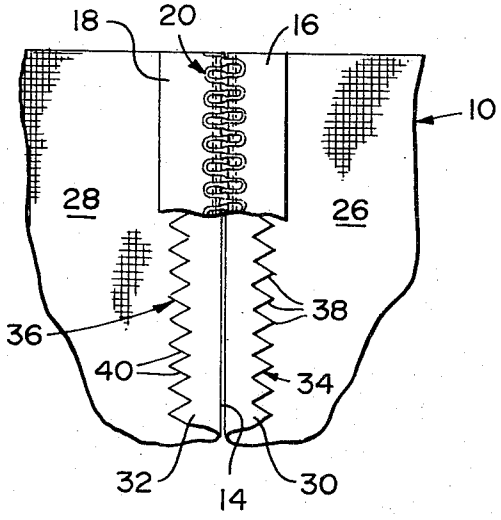


FIG. 3

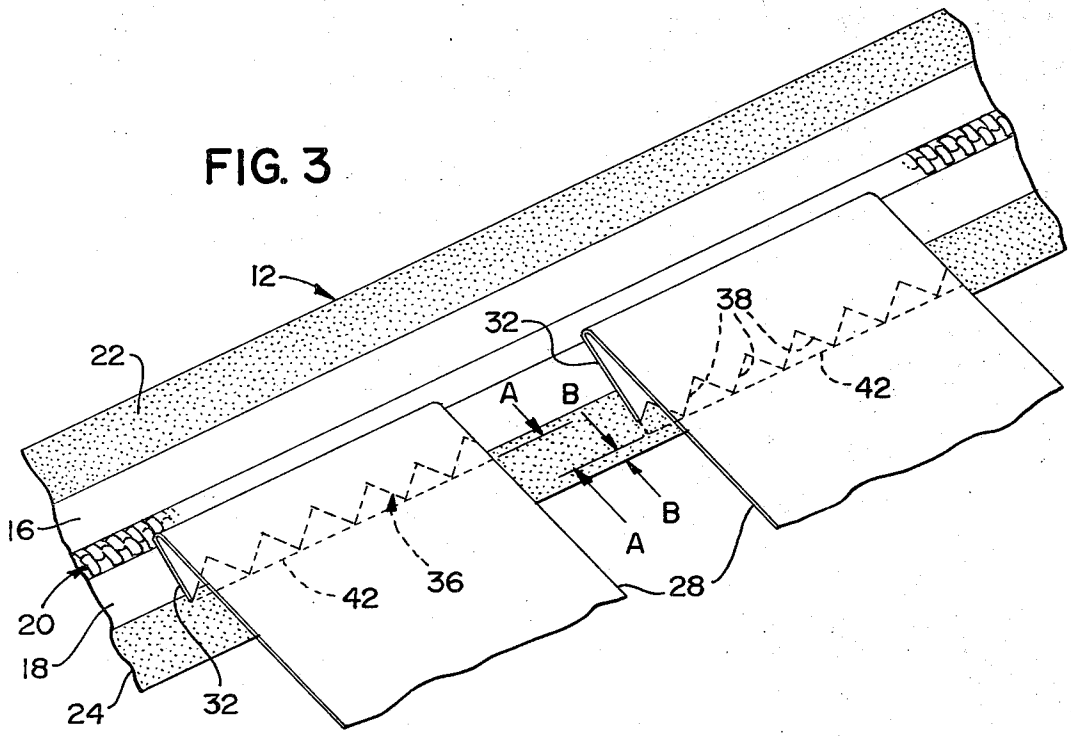


FIG. 4a FIG. 4b FIG. 4c FIG. 4d FIG. 4e

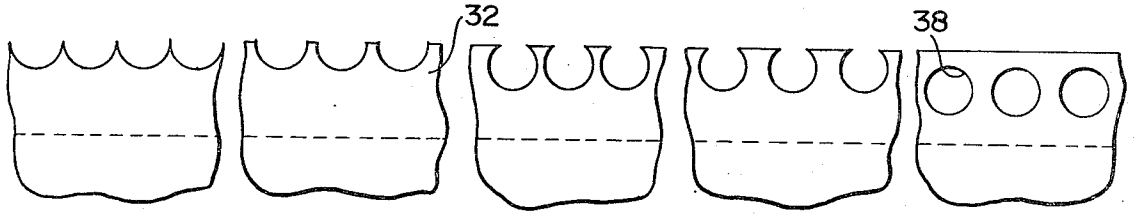


FIG. 5a FIG. 5b FIG. 5c FIG. 5d FIG. 5e

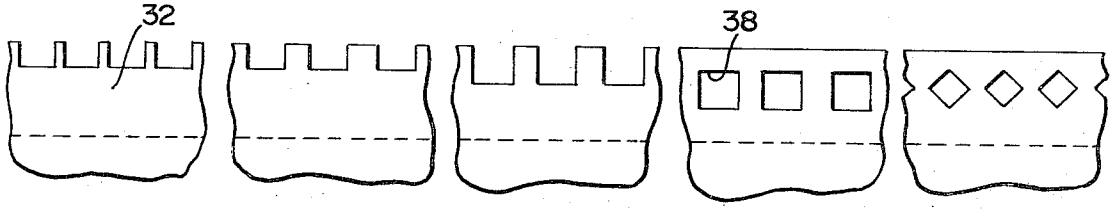


FIG. 6a FIG. 6b FIG. 6c FIG. 6d FIG. 6e

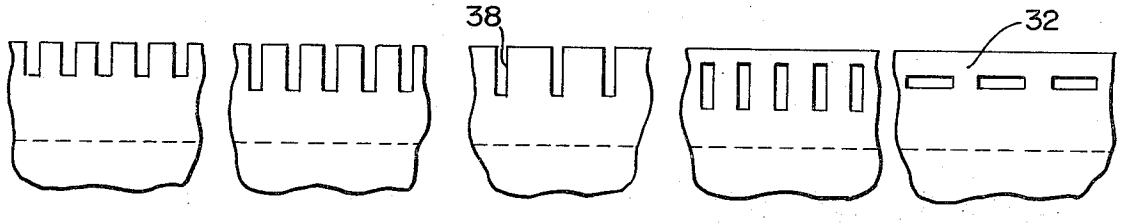
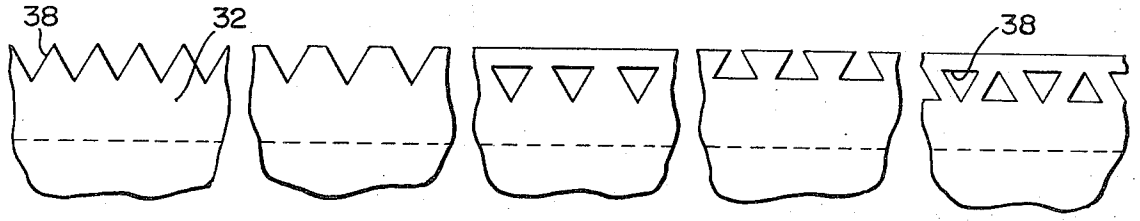


FIG. 7a FIG. 7b FIG. 7c FIG. 7d FIG. 7e



ADHESIVE INSTALLED SLIDE FASTENER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to slide fastener attachments and, more particularly, to a slide fastener securely attached by an adhesive to a garment both directly and through voids in the garment fabric.

2. Description of the Prior Art

In installing a slide fastener in a garment, it has been the general practice in the past to sew the slide fastener to the garment by utilizing a sewing machine having a special pressure foot designed for use with the particular type of fastener being attached. Certain obvious disadvantages have long been known in the stitching method of installing a slide fastener such as the need for the special pressure foot noted above, the need to match the stitching thread color with that of the garment fabric, and the general or overall complexity of the sewing operation. These factors become even more important when mass-production installations are considered, as in the production of new dresses, jackets, tents, sleeping bags and the like.

With the advent of improved adhesives suitable for attaching two pieces of fabric together, considerable attention has been given to the development of a threadless method of installing a slide fastener in a garment. The prior art, as exemplified by U.S. Pat. No. 3,561,073, is generally cognizant of iron-on slide fasteners designed to avoid the need for sewing the fastener to the garment. In general, such devices have not proven to be fully satisfactory since they require such a high degree of accuracy in installation that it is often more convenient to use conventional sewing techniques. In addition, in virtually all fastener installations, whether bonded or sewn, a flap or seam allowance of the garment material must be turned under and joined to the fastener to hide the cut edge of the fabric. When installing the fastener by sewing, the stitches go through the carrier tape and both fabric layers (i.e., the folded flap and the main fabric sections); thus, the width of the seam allowance is not critical. For adhesive bonding, however, the width of the folded flap becomes a critical factor since the fastener carrier tapes must physically contact both the flaps and the main fabric sections in order to provide the desired bond. If the seam allowance is too narrow, it will not contact the adhesive and thus will not be bonded. Likewise, if it is too wide, the exposed contact area of the main fabric section will be insufficient to assure proper attachment thereof with the slide fastener. Either of these situations could cause a failure of the installation.

While the prior art has recognized the need to attach both the main fabric sections and the seam allowances to the carrier tapes and has attempted to accomplish this by using multiple strips of adhesive, the aforementioned problems of seam allowance width and installation accuracy heretofore have been neither solved nor even identified. As a result of these disadvantages, among others, prior art threadless slide fastener attachment devices and techniques have not been considered practical and, thus, have not received general acceptance.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention

to reduce the complexity and difficulty associated with the installation of slide fasteners by adhesive bonding.

The present invention is summarized in that a garment includes a pair of fabric sections meeting at an opening, a seam allowance on each fabric section along the opening being folded back upon its respective fabric section, a slide fastener having a pair of carrier tapes each in superposition with one of the folded seam allowances, each seam allowance defining a plurality of voids therein, and an adhesive bonding each carrier tape with its associated seam allowance, the adhesive communicating through the voids with the fabric sections to bond the tapes with the fabric sections whereby positive attachment of the fastener to both the fabric sections and the seam allowances may be easily accomplished.

Another object of this invention is to install a slide fastener in a garment by bonding the fastener tapes directly to the folded seam allowances of a garment and, through voids in the seam allowances, to the main or outer fabric sections.

The present invention has a further object in that a slide fastener may be securely bonded to the main fabric sections as well as the seam allowances of a garment by applying heat and light pressure from an iron and without the use of stitching threads.

The present invention is advantageous over the prior art in that the need for stitching threads is eliminated, the difficulties associated with fabric alignment prior to fastener installation are reduced, and the resulting bond is both secure and durable.

Other objects and advantages of the present invention will become apparent from the following description of a preferred embodiment when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view, partially broken away, of a preferred embodiment of a slide fastener installed in a garment in accordance with the present invention;

FIG. 2 is a bottom plan view, partially broken away, of the garment and slide fastener of FIG. 1;

FIG. 3 is a diagrammatic view in perspective illustrative of certain operational features of the embodiment of FIG. 1;

FIGS. *4a–4e* are partial plan views of one series of seam allowance configurations according to the present invention for use in the embodiment of FIG. 1;

FIGS. *5a–5e* are partial plan views of another series of seam allowance configurations of the present invention;

FIGS. *6a–6e* are partial plan views of a further series of seam allowance configurations of the present invention; and

FIGS. *7a–7e* are partial plan views of another series of seam allowance configurations of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is embodied in a garment indicated generally at **10** in FIGS. 1 and 2 having a slide fastener **12** which is longitudinally aligned over an opening **14** in the garment. Fastener **12** has a pair of carrier tapes **16** and **18** to which are fixedly attached

alternate ones of a series of interengagable coupling elements shown generally at **20.**

Single elongated strips of adhesive material **22** and **24** are disposed longitudinally along each of the carrier tapes **16** and **18,** respectively, for bonding the fastener **12** to the garment **10.** Adhesive strips **22** and **24** are preferably made of a suitable thermoplastic material which will soften in response to the heat from a conventional iron and, upon cooling will provide a lasting bond which is flexible and will withstand normal machine or dry cleaning processes. It is also preferred that the adhesive be applied first to the fastener carrier tapes **22** and **24** and, prior to installation, that the adhesive be durable and in a form which is not sticky. In this manner, the prepared slide fastener may be stored for later use without having to apply the adhesive at that time. Of course, while the above is preferred, it should be appreciated that the adhesive strips **22** and **24** may be of any desired type; for example, they may be thermosetting, thermoplastic or curable independent of heat, may be in liquid, solid, paste or gel form, or may be pre-applied to the slide fastener or applied to the garment or fastener during installation.

Garment **10** has a pair of fabric sections **26** and **28** which meet at opening **14** as shown in FIG. **1.** Each of the fabric sections has a seam allowance **30** and **32,** respectively, which is folded back over the main portion of the fabric section. Longitudinal terminal edges **34** and **36,** respectively, of seam allowances **30** and **32** are cut in a zigzagged shape, as by pinking shears, to define a plurality of voids or openings **38** and **40** for facilitating fastener installation.

In installing the fastener **12,** the garment **10** is first prepared by cutting the terminal edges **34** and **36** of the seam allowances **30** and **32** with pinking shears or the like to form the zigzagged pattern which defines voids **38** and **40** with the garment placed front down as shown in FIG. **2.** While the width of the seam allowances must fall within certain limits, the precise dimension is not critical as will be more fully described below. The slide fastener is then placed in superposition with the folded seam allowances, with adhesive strips **22** and **24** in physical contact with the garment fabric. Upon the application of heat and slight pressure, the adhesive becomes softened and will form a secure bond with the garment.

As shown in FIG. **1,** the adhesive is in direct contact with the terminal edges of the seam allowances and thus forms a positive direct bond between the seam allowances and the carrier tapes. The adhesive is also in direct contact with the main fabric sections **26** and **28** and, in addition, communicates with the main fabric sections through voids **38** and **40** in the seam allowances **30** and **32,** respectively. In this manner, the fastener **12** is attached, at each carrier tape to both the main fabric sections **26** and **28** as well as the folded seam allowances **30** and **32.**

It can be appreciated that if one of the seam allowances were to become loose at any point, the detached fabric edge might readily impede the path of the fastener slider and cause undesired binding and wear. Likewise, if one of the main fabric sections were to become detached from the fastener at any point, the garment would have a tendency to open at that point, causing distortion of the fastener and detracting from the appearance of the garment. Thus, the width of the seam allowances must fall within certain limits so as to insure that the edge of each seam allowance is properly bonded to the fastener and to assure that each of the main fabric sections is attached by approximately half of its associated adhesive strip.

In the past, the permissible width variations within the above defined limits have been extremely small so that the procedure of folding the seam allowances and then accurately holding them in place during the ironing step has been found to be quite difficult. In fact, it has been recommended that the two fabric sections first be sewn together at the desired opening so that the seam allowances can be accurately cut and will be held in place for the fastener installation. However, the criticality of the installation nonetheless remains, and a sewing step, which adhesive bonding was initially designed to eliminate, has been disadvantageously retained. The present invention efficiently overcomes this problem by providing voids or openings in the seam allowances through which the adhesive bonds the fastener with the main fabric sections.

To illustrate the ease of installing a slide fastener according to the present invention, reference is made to FIG. **3** which shows diagrammatically the outer limits of seam allowance width by which an acceptable bond may be made. In the case of the fabric section **28** on the left of the drawing, seam allowance **32** has been folded so that the peaks of the zigzagged edge **36** slightly overlap adhesive strip **24** of the fastener and a firm bond may be made therebetween. Also, the major portion of strip **24** is left uncovered by seam allowance **32** to provide a substantial direct bond between the fastener and that portion of main fabric section **28** overlying the adhesive. Thus, both the outer and folded inner fabric layers are securely attached to the fastener. Likewise, where the width of the seam allowance is at its maximum, as illustrated on the right in FIG. **3,** the seam allowance is bonded over a relatively large area, and the outer fabric section is directly bonded over a small area just beyond the edge of the underlying seam allowance as well as the additional areas exposed by the voids **38.** Thus, it can be appreciated that the width variation permissible in the seam allowances of the present invention is equal to dimension A—A in FIG. **3.** If none of the voids **38** were made in the seam allowances and assuming that the seam allowances had a straight edge **42,** shown dotted in the drawing, the allowable width variation would have to be reduced since the bond area in the case on the right would only be that within dimension B—B. Therefore, the maximum seam allowance width is considerably less in the prior art in order to make a fabric-to-fastener bond over approximately half of the adhesive area as is provided by the present invention. Since the adhesive width is sometimes in the order of one-quarter inch, the use of a seam allowance having openings such as voids **38** according to the present invention increases the useful space in which the seam allowance width may vary to that shown as dimension A—A; and, thus, takes maximum advantage of the small adhesive area. This represents a major improvement in that the critical and often frustrating steps of measuring, folding and holding the seam allowances are made much simpler in accordance with the present invention since the permissible width variations of the seam allowances of the present invention are much greater than those previously accepted.

While the zigzagged edge **36** is considered to be a convenient method of producing the openings or voids

38, any number of different edge or hole patterns may be used with the same beneficial result. Openings of any shape could be placed near the edge of the seam allowances and/or the edge itself may be zigzagged or serrated by circles, triangles, rectangles or the like. FIGS. 4*a*–4*e*, 5*a*–5*e*, 6*a*–6*e* and 7*a*–7*e* are exemplary of some of the many pattern configurations which may be used and are not intended to represent the only patterns contemplated as being within the scope of the present invention. All such patterns, by providing openings or voids in the seam allowances would have the same effect as pinking in that proper bonds of the main fabric sections, the flap or seam allowance portions, and the slide fastener tape could be made without the need for extremely careful alignment of three layers.

Inasmuch as the present invention is subject to many variations, modifications and changes in detail, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. In a garment, the combination comprising
a pair of fabric sections meeting at an opening,
a seam allowance on each fabric section along the opening, each seam allowance folded back upon its respective fabric section,
a slide fastener longitudinally aligned over the opening and having a pair of elongated carrier tapes each in superposition with one of said folded seam allowances,
each seam allowance defining a plurality of voids therein, and
adhesive means bonding each carrier tape to its associated seam allowance, said adhesive means communicating through said plurality of voids with said garment fabric sections to bond said carrier tapes to said fabric sections whereby positive attachment of said slide fastener to both said fabric sections and said seam allowances is facilitated.

2. The invention as recited in claim 1 wherein said adhesive means comprises a thermoplastic adhesive.

3. The invention as recited in claim 1 wherein said adhesive means comprises a single strip of thermoplastic adhesive running along each of said carrier tapes and responsive to heat from a garment iron to bond said slide fastener to both said seam allowance and said fabric sections.

4. The invention as recited in claim 1 wherein said voids defined by each of said seam allowances comprise a series of closed holes therethrough.

5. The invention as recited in claim 1 wherein said voids defined by each of said seam allowances comprise a series of non-circular openings in spaced relation to each other.

6. The invention as recited in claim 1 wherein each of said seam allowances has a serrated longitudinal edge defining said plurality of voids.

7. The invention as recited in claim 6 wherein said serrated edges of said seam allowances are zigzagged.

8. In a garment, the combination comprising
a pair of fabric sections each having a main portion and a folded portion joined by a common edge,
the common edges of the fabric sections being adapted to meet each other,
each folded portion having a terminal edge spaced from its respective common edge,
means defining a series of openings in each folded portion adjacent its respective terminal edge, and
a slide fastener having a pair of carrier tapes each having a single strip of thermoplastic adhesive thereon,
said slide fastener being bonded directly to said folded portions and through said openings to said main portions by said strips of thermoplastic adhesive.

9. The invention as recited in claim 8 wherein each terminal edge of said folded portions comprises a serrated edge defining said openings.

10. The invention as recited in claim 9 wherein said serrated edges of said folded portions are zigzagged.

11. The invention as recited in claim 8 wherein said series of openings of said folded portions comprises a series of holes therethrough.

12. The invention as recited in claim 8 wherein said series of openings in each of said folded portions comprises a plurality of openings longitudinally spaced from each other along said terminal edge of said folded portion.

13. The invention as recited in claim 12 wherein said plurality of openings have substantially circular shapes.

14. The invention as recited in claim 12 wherein said plurality of openings comprises spaced voids cut out of each folded portion in transverse spaced relation to its respective terminal edge.

* * * * *