United States Patent

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[73] Assignee **Textron Inc.**

[54] **SLIDE FASTENER CARRIER TAPE**
11 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **139/384,** 24/205.1, 24/205.16
[51] **Int. Cl.** **A44b 19/00**
[50] **Field of Search** 139/384, 420; 24/205.1, 205.16

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ABSTRACT: A slide fastener including a folded carrier tape having warp threads at the folded portions made of a synthetic, self-lubricating material such that the carrier tape resists wear at the folded portions and the movement of a slider along the folded portions is facilitated.

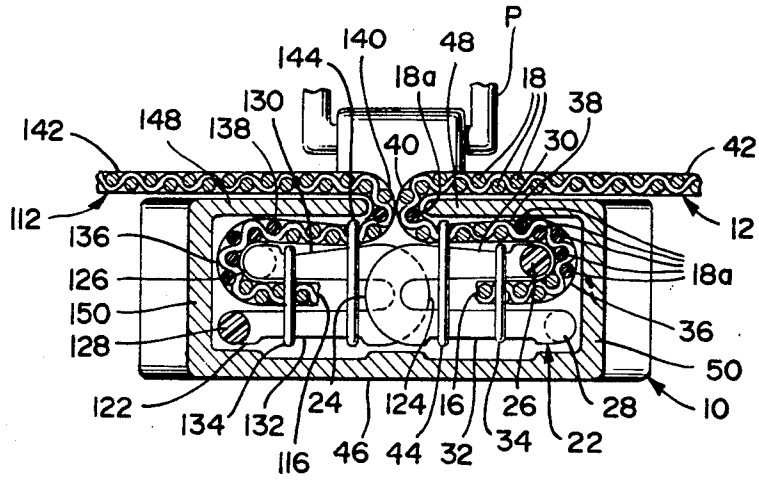


FIG. 1

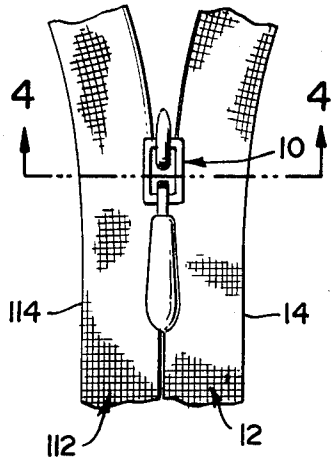


FIG. 4

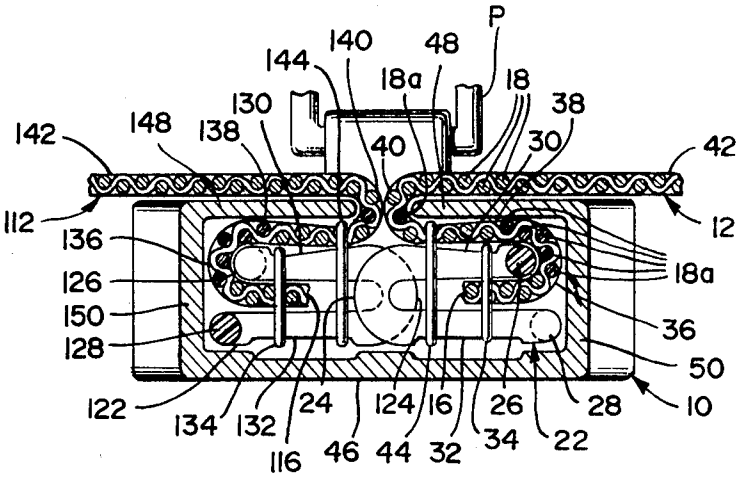


FIG. 3

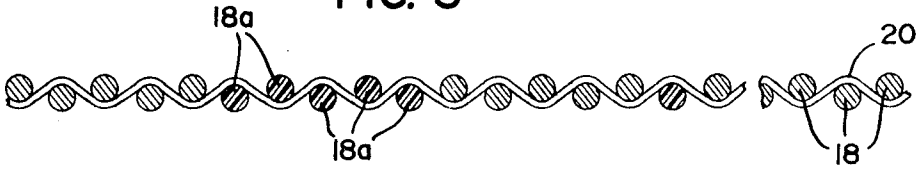


FIG. 5

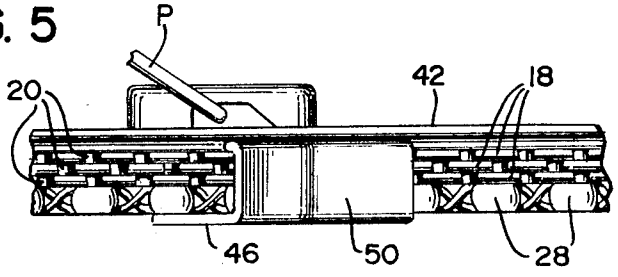
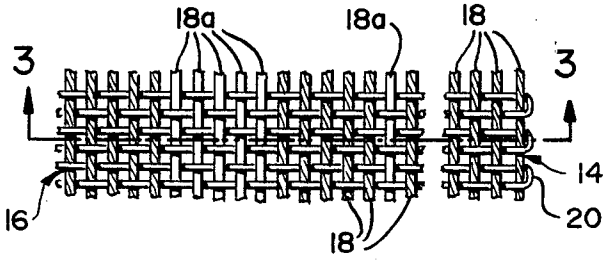


FIG. 2



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SLIDE FASTENER CARRIER TAPE

BACKGROUND OF THE INVENTION

I. Field of the Invention

The present invention pertains to slide fasteners and more particularly to carrier tapes for slide fasteners.

2. Description of the Prior Art

In order to form seam-type slide fasteners, the carrier tape to which the interengageable elements of the fastener are attached is folded such that the interengageable elements are not visible. The folds in the carrier tape are adapted to be received by the slider during opening and closing operation; and, accordingly, the folded portions of the carrier tape tend to wear and impede movement of the slider. That is, the thread normally utilized in weaving carrier tapes is not sufficiently lubricous to permit easy movement of the slider nor strong enough to withstand the wear attendant the use of its folded portions as bearing surfaces.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to utilize a lubricous carrier tape with a slide fastener.

The present invention is summarized in a carrier tape for a slide fastener including an inner marginal portion for attachment to interengageable elements of the slide fastener, and thread means at the inner marginal portion made of a synthetic, self-lubricating material.

Another object of the present invention is to position threads of a self-lubricating material in a carrier tape to permit nonsticking movement of a slider.

A further object of the present invention is to make warp threads at folded portions of a slide fastener carrier tape of a synthetic self-lubricating material.

The present invention has another object in that the bearing surfaces where a carrier tape contacts a slider include warp threads made of a synthetic, self-lubricating material.

Some of the advantages of the present invention over the prior art are that the slide fasteners resist wear during operation and cleaning, and sliding movement of the slider for the slide fasteners is facilitated.

Further objects and advantages of the present invention will become apparent from the following description of the preferred embodiment taken in conjunction with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a partial elevation of a slide fastener embodying the present invention.

FIG. 2 is a plan view of a carrier tape embodying the present invention.

FIG. 3 is a cross section of the carrier tape of FIG. 2 taken along line 3–3.

FIG. 4 is an enlarged cross section of the slide fastener of FIG. 1 taken along line 4–4.

FIG. 5 is an enlarged, broken side view of the slide fastener of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A slide fastener embodying the present invention is illustrated in FIG. 1 and includes a slider **10** that is manually movable to open and close interengageable elements mounted on carrier tapes indicated generally at **12** and **112**. Since the carrier tapes and interengageable elements on either side of the slide fastener are identical, only the structure of the right hand side will be described in detail, and reference numbers with **100** added will be utilized to indicate identical structure of the left-hand side.

Carrier tape **12** has an outer selvage edge **14** for attachment to a web of material, such as that of a garment, and an inner marginal portion **16** for attachment to the interengageable elements of the slide fastener in a manner to be described

hereinafter. As shown in FIGS. **2** and **3**, carrier tape **12** is woven with a plurality of longitudinal warp threads **18** and a plurality of weft or filter threads **20** running transverse to the warp threads.

The interengageable elements are indicated generally at **22** in FIGS. **4** and **5** and are made of any type of filamentary material, such as suitable plastic. The elements **22** include spaced interengageable heads **24** connected with an upper arcuate heel **26** and a lower arcuate heel **28** through superposed legs **30** and **32**, respectively. The inner marginal portion **16** of carrier tape **12** is secured to elements **22** by disposing the end of the carrier tape in the spaces between upper heels **26** and lower heels **28** and fastening the end in such position by stitching threads **24** which encircle legs **30** and **32**. The carrier tape is folded around upper heel **26** at **36** to form a middle layer **38** overlying legs **30** and reverse folded upon itself at **40** to form an upper layer **42**. Layer **38** is secured to elements **22** by stitching threads **44** which encircles arms **30** and **32**.

As is well known in the art, the slider **10** is utilized to control the meshing of interengageable element **22**. The slider **10** has a bottom wing **46** and a pair of top flanges **48** and **148** joined to the bottom wing **46** by a pair of slide flanges **50** and **150**, respectively, to form a meshing chamber. The carrier tapes extend from the chamber through a channel communicating therewith between top flanges **48** and **148**, and the top flanges **48** and **148** are disposed under the upper layers **42** and **142**, respectively, of the carrier tapes. A pull P is utilized for manual movement of the slider **10** causing the mating and unmating of the interengageable elements **22** and **122** to close and open the slide fastener, respectively.

The outer surface of fold **36** of carrier tape **12** has a tendency to rub against top flange **48** and side flange **50**; and similarly, the inner surface of fold **38** has a tendency to rub against the end of top flange **48**. These areas which have a tendency to rub against the slider are referred to as bearing surfaces, and the actual area and positioning of the bearing surfaces of the carrier tape will vary dependent upon the type of interengageable elements utilized, the manner in which the elements are attached to the carrier tape and the slider for use therewith.

At the bearing surfaces, warp threads **18*a*** are utilized in place of warp threads **18** which are normally made of a conventional, naturally occuring material. Warp threads **18*a*** are made of a synthetic, self-lubricating material such as polytetrafluorethylene. By self-lubricating material is meant a lubricous material which can withstand sliding forces without degradation and facilitates sliding movement thereacross without the necessity of an externally applied lubricant.

As shown in FIG. 4, approximately five warp threads **18*a*** are positioned around the outer surface of fold **36** such that the warp threads **18*a*** will bear against flanges **48** and **50** of the slider. A single warp thread **18*a*** is positioned at the inner surface of fold 40 such that it will bear against the end of top flange **48** of the slider. Since stitching thread **44** holds middle layer **38** of carrier tape **12** against leg **30** and away from top flange 48, only the above mentioned six warp threads **18*a*** need be utilized to assure nonsticking movement of the slider and to improve the wear resistance of the slider fastener. It should be clear however, that more or less warp threads **18*a*** may be utilized and positioned dependent upon the slide fastener structure, as mentioned above.

Warp threads **18*a*** are illustrated in FIGS. **2** and **3** as positioned in carrier tape **12** prior to attachment of the carrier tape to the interengageable elements **22**. The five warp threads **18*a*** which are to be positioned at fold **36** are spaced from the end of inner marginal portion **16** of the carrier tape by five conventional warp threads **18**, and the single warp thread **18*a*** which is to be positioned at fold **38** is spaced from the five warp threads **18** by five conventional warp threads **18**. The carrier tape is woven in conventional manner; however, warp threads **18*a*** are substituted for the conventional warp threads **18** at positions corresponding to bearing surfaces of the carrier tape as utilized in the finished slide fastener.

Interengageable elements **22** are in parallel relation with the warp threads such that warp threads **18***a* provide a bearing surface for the slider. The self-lubricating characteristic of the warp threads **18***a* permits easy nonsticking sliding movement of the slider **10** over the carrier tapes and prevents wear from such sliding movement. Accordingly, the life of slide fasteners embodying the present invention is greatly increased, and sliding operation of the slide fastener is facilitated.

In as much 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 drawing shall be interpreted as illustrative and not in a limiting sense.

What I claim is:

1. A carrier tape for use with a slide fastener comprising

an inner marginal portion for attachment to interengageable elements of the slide fastener, and

thread means at said inner marginal portion made of a synthetic, self-lubricating material.

2. The invention as recited in claim **1** wherein said carrier tape is woven with a plurality of warp threads extending in parallel relation with the interengageable elements of the slide fastener, and said thread means are selected ones of said warp threads.

3. The invention as recited in claim **2** wherein said material is polytetrafluorethylene.

4. A slide fastener comprising

interengageable element means;

a slider having a chamber receiving said interengageable element means to control the interengaging thereof; and

carrier tape means attached to said interengageable element means and having bearing surface portions disposed in said chamber of said slider, said bearing surface portions having threads made of a synthetic, self-lubricating material.

5. The invention as recited in claim **4** wherein said threads are warp threads disposed in parallel relation with said interengageable element means.

6. The invention as recited in claim **5** wherein said interengageable element means includes a plurality of upper and lower heels and said carrier tape means has an inner end disposed between said upper and lower heels and said carrier tape means is folded over said upper heels to define a first of said bearing surface portions.

7. The invention as recited in claim **6** wherein said slider has a channel communicating with said chamber and said carrier tape means extends through said channel and is folded thereabout to define a second of said bearing surface portions.

8. The invention as recited in claim **7** wherein said material is polytetrafluorethylene.

9. A carrier tape for use with a slide fastener, said carrier tape having folded portions with warp threads therein made of a synthetic, self-lubricating material.

10. The invention as recited in claim **9** wherein said carrier tape has an inner end, a first of said folded portions is spaced from said inner end, and a second of said folded portions is spaced from said first-folded portion.

11. The invention as recited in claim **10** wherein said carrier is woven with threads of a naturally occurring material in the spaces between said inner end and said first-folded portion and between said first and second folded portions, and said synthetic, self-lubricating material is polytetrafluorethylene.