

[54] **WOVEN ZIP FASTENER**

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[56] **References Cited**

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[57]

ABSTRACT

A zip fastener is disclosed which comprises a pair of oppositely disposed stringer tapes and a row of fastener elements woven into a longitudinal edge portion of each stringer tape. The fastener elements are secured with greater firmness to the tape by means of a special weave formed by successive loops of weft thread extending parallel with warp threads.

5 Claims, 4 Drawing Figures

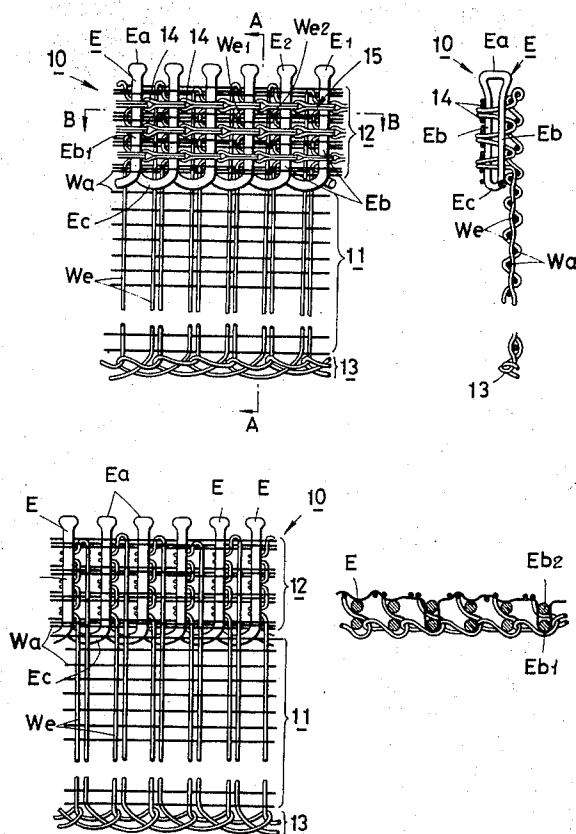


FIG. 1

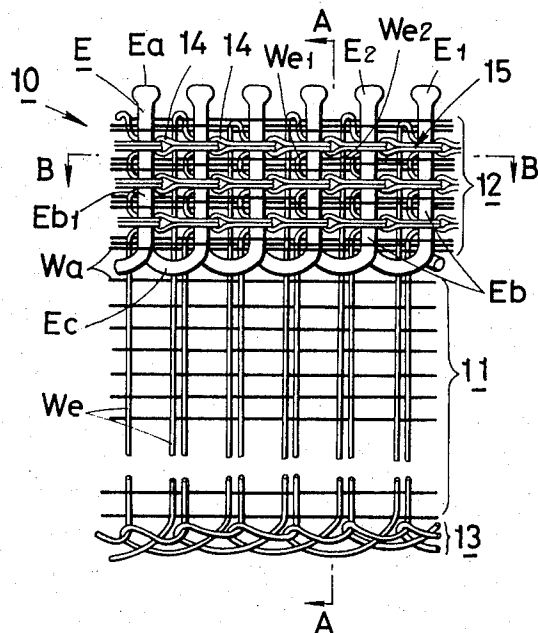


FIG. 2

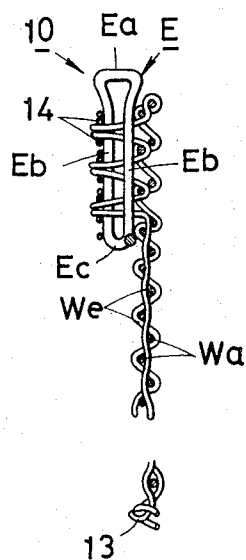


FIG. 3

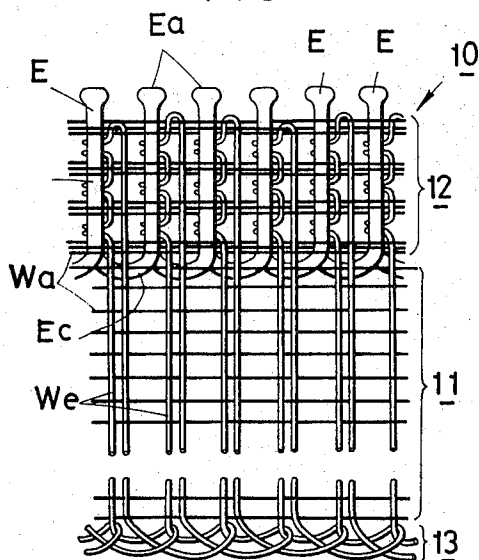
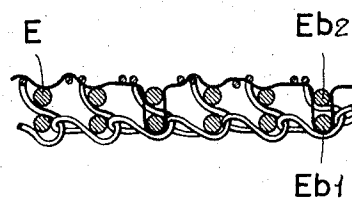


FIG. 4



WOVEN ZIP FASTENER

BACKGROUND OF THE INVENTION

This invention relates to woven zip fasteners and has particular reference to a sliding clasp fastener stringer of the type having a row of interlocking elements formed from a continuous plastic filament into a coil or meander structure and woven into a longitudinal edge portion of a carrier tape during the weaving thereof.

Woven zip fasteners of this description have distinct advantages over the ordinary fasteners wherein a row of interlocking fastener elements is secured by sewing threads to a separately prepared fabric tape. The most outstanding advantage is that the rate of fastener production is increased manifold and the steps of manufacture are simplified.

However, most woven zip fasteners of known type have suffered from the lack of mechanical strength with which the filamentary elements are affixed to the carrier tape, which in turn results in irregular pitch of coupling between adjacent elements. In other words, the fastener elements when woven into the tape system are loosely anchored in place and hence lend themselves to displacement or deformation upon the imposition of tension or pull on the stringer.

SUMMARY OF THE INVENTION

Whereas, it is the primary object of the present invention to provide an improved woven zip fastener which will substantially eliminate the foregoing disadvantages of the prior-art woven fasteners.

A more specific object of the invention is the provision of a fastener stringer incorporating a special weave whereby the fastener elements are secured with sufficient strength and firmness to a carrier tape, during the course of weaving of the latter, to render the elements resistant to displacement or deformation.

These and other objects and features of the invention will appear clear from the following detailed description taken in conjunction with the accompanying drawings illustrating a preferred embodiment which the invention may assume in practice.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a plan view of the important part of a fastener stringer embodying the invention;

FIG. 2 is a transverse cross-sectional view taken on the line A—A of FIG. 1;

FIG. 3 is a rear view of the fastener stringer of FIG. 1; and

FIG. 4 is a longitudinal cross-sectional view taken on the line B—B of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings and FIG. 1 in particular, there is shown a fastener stringer 10 which constitutes one part of a pair of opposed interengageable stringers for a sliding clasp fastener. This stringer 10 in the form of a fabric tape consists of an element-free or cloth web section 11 and an element-containing section 12 constituting a longitudinal edge portion of a tape, both sections consisting of a plurality of warp threads W_a interwoven with double picks of a continuous weft thread W_e . The density of warp threads W_a is greater at the element-containing section 12 than at the cloth

web section 11 with a view to providing increased mechanical strength at the former section and rendering the latter section pliable as desired.

The element-containing section or edge portion 12 of the tape has woven therein a continuous, spirally arranged coupling filament E which constitutes a row of coupling or interlocking fastener elements and which is woven substantially in the same manner as is the weft thread W_e . Alternatively, the filament E originally in a linear form may be preformed into a continuous coil structure and interwoven as the warp along the edge portion 12 of the tape during the weaving operation. The filament E consists of a series of elongated convolutions each of which convolutions has a coupling head E_a projecting outwardly of the tape edge to engage and couple with a corresponding head of convolution on the mating stringer and two leg portions E_{b_1} , E_{b_2} , one substantially superimposed on the other, and a connecting base portion E_c interconnecting adjacent leg portions E_b .

A plurality of groups of warp threads W_a alternately overlie and underlie the successive convolutions of the coupling filament E that are in the region of the leg portions E_b as seen, and cooperate with a special weave of weft W_e later described in fastening the filament E securely in place.

On the opposite edge to the element-containing section 12 is a selvage 13 formed by successive interlaced loops of the weft thread W_e laid in a double pick as in the usual practice. It will be seen that double picks of weft W_e alternately overlie and underlie each group of warp threads W_a in the element-containing section 12. Importantly, either of the two parallel weft threads W_{e_1} , W_{e_2} , in each double pick underlying the filament E is oriented upwardly at a point intersecting with the warp threads W_a and passed in the form of a loop 14 up through the space between an upper and a lower leg portion E_{b_1} , E_{b_2} of each convolution as shown, or upwardly between adjacent elements E_1 , E_2 . The loop 14 thus formed is interconnected in hooked relation with an ensuing loop similarly extending from one of the two parallel weft threads W_e in the next course. A series of these loops 14 are interconnected warpwise to form a weave comparable to a chain stitch which extends parallel with an intermediate between adjacent groups of warp threads W_a . The chain stitch-like weave 15 thus formed cooperates with the groups of warp threads W_a in retaining the coupling filament E firmly in place.

Having thus described the invention, it will be understood that various changes and modifications may be made in the specific form and construction herein advanced, without departing from the scope of the appended claims.

What is claimed is:

1. In woven zip fastener comprising a pair of stringer tapes and a row of fastener elements formed from a continuous filament into a spiral or meandering structure and woven into a longitudinal edge portion of each stringer tape, each of said elements having a coupling head portion, an upper and a lower leg portion and a connecting base portion, the improvement which comprises a stringer tape consisting of an element-free or cloth web section and an element-containing section constituting a longitudinal edge portion of said tape, both sections consisting of a plurality of warp threads interwoven with double picks of a continuous weft thread, each of said double picks having two parallel

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threads underlying a row of fastener elements, one of which parallel threads is oriented upwardly at a point intersecting with said warp threads and passed in the form of a loop up above said row of elements, said loop being interconnected warpwise with an ensuing loop extending similarly from another double pick in the next course.

2. The improvement as defined in claim 1 wherein said loop is passed upwardly through the space between the two leg portions of said element.

3. The improvement as defined in claim 1 wherein

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said loop is passed upwardly between adjacent elements.

4. The improvement as defined in claim 1 wherein the density of said warp threads is greater at said element-containing section than at said cloth web section.

5. The improved as defined in claim 1 wherein said loops are interconnected in a series to form a weave extending parallel with said warp threads, said weave being comparable to a chain stitch.

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