A seaming element for joining opposed ends of an industrial fabric comprises a continuous filamentary structure with substantially U-shaped cross-section, configured as a plurality of looped segments aligned as first and second layers, each segment of one layer being connected to adjacent segments of the other layer by a connecting portion. On insertion through apertures along a fold line of the fabric and between MD yarns or other fabric body components, the connecting portions and portions of the looped segments protrude from the fold line to provide a channel. Free ends of the looped segments engage with the fabric body between the apertures. Seaming elements provided to the opposed fabric ends are interdigitated and together form a continuous channel to receive a pintle. The seaming element overcomes problems of alignment of the fabric ends to securing the seam, while minimizing any disruption in fabric properties adjacent the seam area.
ABSTRACT

A seaming element for joining opposed ends of an industrial fabric comprises a continuous filamentary structure with substantially U-shaped cross-section, configured as a plurality of looped segments aligned as first and second layers, each segment of one layer being connected to adjacent segments of the other layer by a connecting portion. On insertion through apertures along a fold line of the fabric and between MD yarns or other fabric body components, the connecting portions and portions of the looped segments protrude from the fold line to provide a channel. Free ends of the looped segments engage with the fabric body between the apertures. Seaming elements provided to the opposed fabric ends are interdigitated and together form a continuous channel to receive a pintle. The seaming element overcomes problems of alignment of the fabric ends to securing the seam, while minimizing any disruption in fabric properties adjacent the seam area.
FILAMENTARY SEAMING ELEMENT FOR AN INDUSTRIAL FABRIC AND
INDUSTRIAL FABRIC SEAMED USING THE ELEMENT

FIELD OF THE INVENTION

The present invention concerns a seaming element for use in industrial fabrics, in particular filtration fabrics such as papermaking fabrics, and fabrics seamed using the element. The invention has particular relevance to a seaming element which may be used to join the opposing ends of both woven and nonwoven industrial fabrics, where a fold line is provided. The invention is particularly applicable to such fabrics having at least a machine direction component system such as yarns, and in particular so-called multiaxial fabrics, so as to render them endless by placement of the element behind and between selected machine direction components at a fold line of the endless fabric body.

BACKGROUND OF THE INVENTION

Industrial fabrics are textile products manufactured for non-aesthetic purposes, such as filtration and conveyance, where function is the primary criterion. These fabrics may be woven or nonwoven i.e. the fabric components are either yarns interlaced about one another in a regular manner, or they are yarns laid as independent arrays which are intermingled or otherwise bonded together, or the components are sheets or strips of a continuous nonwoven material such as film or a bonded fibrous material. The present invention concerns all of such types of fabric, but it is particularly relevant to those industrial fabrics which include at least a machine direction (MD), or longitudinal direction fabric component system, preferably including yarns. One type of industrial fabric to which the present invention is particularly relevant are so-called multiaxial fabrics which are, to an extent, hybrids of both woven and nonwoven industrial textiles.

Multiaxial industrial fabrics are well known and have seen extensive use over the past decade for both papermaking and filtration applications. Descriptions of these fabrics and seams therefor can be found in at least the following US patents: US 5268076 (Best), US 5360656 (Svensson), US 5476123 (Rydin), US 5785818 (Fekete et al.), US 5916421 (Yook), US
5939176 (Yook), US 6117274 (Yook), US 6265048 (Rydin et al.), US 6776878 (Yook), US 7207355 (Lee), US 7229531 (Yook et al.), US 7381308 (Kornett et al.), US 7473336 (Hawes et al.); others are known.

5 Multiaxial fabrics are comprised of a base fabric structure to which one or more layers of a fibrous nonwoven material is needled or otherwise attached. This base fabric structure is formed by spirally winding one of either a woven fabric strip having a width less than the overall width of the final fabric, or an array of yarns, or other continuous nonwoven material from a stock roll over and around two rotating parallel rolls to form a fabric tube. The stock roll is translated at a suitable rate along one of the rolls to build up the desired fabric width of helically wound material. The rolls are separated by a distance which is equal to the length of the required finished fabric. Successive turns of the fabric strip or yarn array are abutted against one another and are attached to one another along their helically continuous seam by a suitable bonding process to produce the base fabric layer. The base fabric layer so obtained has an inner surface, an outer surface, a machine direction and a cross-machine direction, and is in the form of a continuous tube.

The base fabric layer, which at this stage has a degree of coherence due to the bonding of its components, is removed from the parallel rotating rolls and prepared for seaming. This textile is then flattened and fold lines created at opposite ends of the flattened structure to form a fabric having two distinct layers or plies. If formed from a woven strip, as is most common, cross-machine direction (CD) yarns are removed from the area immediately adjacent the fold lines leaving machine direction (MD) oriented yarns exposed. If formed from an array of parallel yarns, or other continuous nonwoven material, much the same process is performed to expose at least a portion of the MD components at the fold area so as to leave loop-like structures at the opposed fabric ends. In either case, loops are formed by the MD yarns or other fabric components as they are bent, along with the fabric, to form a double layer two-ply structure.
In order for these fabrics to be installed on the machine for which they are intended, such as for example the press section of a papermaking machine, it is necessary to provide a seam which can be simply and reliably closed by the machine operator when the fabric is located in its proper position. In the past, such seams were formed in a variety of ways, but the most predominant method has been to manipulate the MD oriented yarns of the fabric so as to form loops on each opposing fabric end at the two fold areas; see, for example, US 7207355 (Lee). A problem common to all such fabrics whose seaming loops are formed using the MD yarns relates to the alignment of the loops at the opposed fabric edges. Because the vast majority of these multiaxial fabrics must be joined by hand on the machine, it is critical that the fabric ends be easily joined, usually by manual insertion of a pintle, or pin, across the full width of the fabric through the seaming loops. As papermaking and similar machines have become larger, the width of these fabrics has increased correspondingly and may be as much as 10 meters or more in machines currently in use. In the present practice method discussed above, where a portion of the CD elements such as yarns are removed adjacent each fold area of the fabric so that the MD components are freed, it is difficult to ensure that the loops formed by the MD components are precisely aligned at the fold areas to facilitate the pintle insertion during fabric installation.

One means of addressing this problem is disclosed by Yook, US 5916421. The ‘421 patent teaches a means of providing an on-machine seam for multiaxial press fabrics such as are disclosed in US 5306656 and US 5268076. According to the ‘421 disclosure, a seaming element is positioned at the CD widthwise folds of the flattened multiaxial base fabric where a portion of the CD yarns have been removed to expose the MD yarns. The seaming element is a length of fabric (single or multi-layer) produced by a modified endless weaving technique whereby the weft yarns are continuously woven back and forth across the loom and about a pin to form the seaming loops (according to techniques described by Cordorniu, US 3815645). The seaming element is installed between the layers so that the loops extend outwards between the MD yarns; the element is then stitched in place. However, as noted in the patent, the seaming element causes a triple ply region to exist at the seam, so that the fabric should not be used in situations where marking may be a problem.
Various other methods have been disclosed to assist in providing a seaming means for a multiaxial fabric which attempt to both minimize any fabric discontinuity and improve the overall seamability of the textile when it is installed on the machine for which it is intended.

The solution proposed by Lee in US 7207355 has been effective; however, none has been wholly satisfactory in addressing the problems of seam uniformity and pintle inserting resulting from uneven seam loop length.

SUMMARY OF THE INVENTION

It has been found that an advantageous seaming element can be provided, comprised of a continuous filamentary structure which is deformedly set in a configuration to form a plurality of looped segments aligned as a first and second layer, and connected to one another by a connecting portion so as to present a substantially U-shaped cross-section. The continuous filamentary structure of the seaming element is shaped and dimensioned according to the mesh and yarn size of the fabric into which it is to be placed so as to a) minimize any disruption in fabric properties adjacent the seam area, and b) permit its insertion behind selected machine direction components at a fold area of the fabric so that its looped segments protrude uniformly beyond the fold line and between selected machine direction components such as yarns. The connecting portions and adjacent portions of the looped segments provide a pintle receiving channel, while the free ends of the looped segments engage with the MD components of the fabric to retain the seaming element in the desired position. When the opposed ends of the fabric are each equipped with a filamentary seaming element configured in this manner, they may be joined, as discussed further below, by bringing the protruding portions together to form a continuous channel through which a joining pintle may be passed.

It has further been found that the seaming elements of the present invention are particularly advantageous for on-machine seamable industrial fabrics which include a base fabric structure into which a pre-fabricated seaming element is installed at the lateral (CD) edges to enable the fabric ends to be joined. The industrial fabric may consist of a multiaxial base
fabric structure comprised of a plurality of spirally wound turns of a narrow woven fabric which have been joined together along their longitudinal edges, or the base structure may consist of an MD oriented array of yarns which have been joined together by a chosen bonding means to form a cohesive structure (e.g. as described in US 6491794). The base fabric structure may also be a woven structure which has been folded at its CD edges to provide two separate plies at that location, or it may be a wholly nonwoven structure such as a film or other nonwoven fibrous or continuous material which has been laid flat and folded to form two separate plies and fold edges.

In each case, the base fabric structure is folded to provide two fold lines at opposite ends and a fabric length that is equal to that of the intended finished fabric. A portion of any CD oriented yarns or other material is removed from a portion of the fabric adjacent the fold lines to expose the MD oriented components. A seaming element, comprised of a continuous filamentary structure which is deformedly set in a configuration to form a plurality of looped segments aligned as a first and second layer and connected to one another by a connecting portion and having a substantially U-shaped cross-section, is inserted at each of the two exposed fold edges behind the MD oriented components so that its connecting portions protrude through and between at least a portion of selected individual MD components to provide a pintle receiving channel. The seaming element is held in place at the folds by suitable means and the fabric is joined by interdigitating the connecting portions of the seaming elements and inserting a pintle through the pintle receiving channel. The invention overcomes prior art difficulties of MD yarn loop alignment at the seam region by providing a prefabricated seaming element with a straight through passageway to receive the joining pin which element is installed in the fabric prior to finishing, and which subsequently allows the fabric to be easily joined on the machine for which it is intended.

The invention therefore seeks to provide a seaming element for seaming an industrial textile, the industrial textile comprising a first folded end region having a first fold line, a second folded end region having a second fold line, wherein portions of the industrial textile adjacent to the first and second fold lines respectively define first and second internal spaces,
and each of the first and second fold lines comprise a plurality of spaced apart apertures, the seaming element being a continuous filamentary structure deformedly set in an elongated configuration and comprising a plurality of looped segments having outer free ends and being alternated with connecting portions, wherein

(i) each connecting portion is configured to separate adjacent ones of the looped segments alternately into a first layer of looped segments and a second layer of looped segments;
(ii) the looped segments of the first layer are aligned with each other at their respective outer free ends, and the looped segments of the second layer are aligned with each other at their respective outer free ends;

(iii) each connecting portion is spaced apart from each adjacent connecting portion; and
(iv) the seaming element is constructed and arranged to be insertable into and securable within the first internal space, such that

(a) the connecting portions and portions of each of the first looped segments and each of the second looped segments protrude through the apertures along the first fold line;
(b) the textile body between the apertures along the first fold line engages with the aligned outer free ends of the first and second looped segments; and
(c) the connecting portions of the seaming element are engageable with the corresponding connecting portions of a complementary seaming element correspondingly provided at the second folded end region, such that the connecting portions are securably aligned together to define a continuous longitudinal channel.

The invention further seeks to provide an industrial textile comprising a pair of seaming elements of the invention; and a method of making a seam for an industrial textile, the method comprising

(i) providing a first folded end region having a first fold line and a second folded end region having a second fold line, to define first and second internal spaces between portions of the industrial textile adjacent to the first and second fold lines respectively;
(ii) providing along each of the first and second fold lines a plurality of spaced apart apertures between fabric body portions;
(iii) providing a first seaming element and a second seaming element, each according to the invention;
(iv) inserting the first seaming element within the first internal space, and inserting the connecting portions and portions of each of the first looped segments and each of the second looped segments through the apertures to form a plurality of first protrusions from the first fold line such that the outer free ends of each of the first and second looped segments is engaged with the fabric body portions along the first fold line;
(v) inserting the second seaming element within the second internal space, and inserting the connecting portions and portions of each of the first looped segments and each of the second looped segments through the apertures to form a plurality of second protrusions from the second fold line such that the outer free ends of each of the first and second looped segments is engaged with the fabric body portions along the second fold line;
(vi) securing each of the first and second elements within the respective first and second internal spaces; and
(vii) bringing the first protrusions into engaged alignment with the second protrusions to define a continuous longitudinal channel and securing the first and second elements together to form the seam.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described with reference to the appended Figures in which:
Figure 1 is a perspective view of a seaming element in an embodiment of the invention;
Figure 2 is an end view of the seaming element of Figure 1;
Figure 3 is top view of the seaming element of Figure 1;
Figure 4 is a top perspective partial view of a seaming element and fabric in an embodiment of the invention;
Figure 5 is a top view of the seaming element and fabric of Figure 4;
Figure 6 is a side cross-sectional view of the seaming element and fabric of Figure 5;
Figure 7 is a top perspective partial view of a pair of seaming elements attached to a fabric and connected together in an embodiment of the invention; and
Figure 8 is a side cross-sectional view of the seaming elements and fabric of Figure 7.
DETAILED DESCRIPTION OF THE DRAWINGS

Referring to Figures 1 to 3, an embodiment of a seaming element 100 of the invention is shown. As shown in Figure 1, the seaming element 100 comprises a continuous filamentary structure which is deformedly set in a configuration to form a plurality of looped segments 110, 120, aligned as a first layer 110 of segments 112 and a second layer 120 of segments 122, each segment 112 being connected to each adjacent segment 122 by a connecting portion 150, forming a seaming element having a substantially U shaped cross-section, the connecting portions 150 being curved outwards from the respective segments 112, 122, so as to define a channel 155 between the concave inner curvature of the connecting portions 150 and the adjacent portions of the segments 112, 122. At the opposite end from the connecting portions 150, each of the segments 112 has a looped outer free end 115, and similarly each of the segments 122 has a looped outer free end 125.

As can be seen in each of Figures 1 to 3, the segments 112 of the upper layer 110, and their respective outer free ends 115, are offset from the segments 122 of the lower layer 120 and their respective outer free ends 125. The outer free ends 115 of the segments 112 of the upper layer 110 are aligned with each other, and the outer free ends 125 of the segments 122 of the lower layer 120 are aligned with each other, as seen across the seaming element. In the embodiment shown in Figures 1 to 3, the outer free ends 115 are also substantially aligned with the outer free ends 125, as seen across the seaming element, but in some embodiments the segments could be configured so that the outer free ends of one layer extended beyond those of the other layer.

Referring also to Figure 4, which shows a woven fabric, the connecting portions 150 are configured so that when the seaming element 100 is inserted within a folded region of a fabric to be seamed, such as fabric 200, and adjacent to the fold line at area 230, the connecting portions will pass through apertures along the fold line. In this example, the apertures result from the removal of one or more cross-machine direction yarns 210 at the desired fold line, leaving the machine direction yarns 220 as body portions of the fabric along
the fold line. As the seaming element is inserted between upper fabric layer 202 and lower fabric layer 204 within the folded region 230 of the fabric, and the connecting portions and adjacent portions of the segments 112, 122 pass through the apertures between adjacent MD yarns 220, consecutive ones of the yarns 220 will engage with alternating ones of the segments 112, 122, in the sequence shown in Figures 1 to 3 as 112a, 122a, 112b, 122b, 112c, 122c, in each instance at the inner surfaces of the respective outer free ends 115, 125, to retain the seaming element 100 in the required position. This engagement alternating between upper layer segments 112 and lower layer segments 122 can best be seen in Figure 5, which is a top view of the embodiment of Figure 4, and showing seaming element 100 installed in fabric 200.

Figure 6 is a side cross-sectional view of a seaming element 100 installed in a fabric 200 in an embodiment of the invention.

Referring now to Figures 7 and 8, these show a fabric of the invention in which a pair of seaming elements 100a, 100b has been secured to respective folded fabric regions 230a and 230b of fabric ends 200a, 200b. After being secured to the fabric, for each seaming element 100a, 100b, the connecting portions 150a, 150b and adjacent portions of the segments, shown in Figure 8 as 112d, 122d, 112e, 122e extend through the apertures between the folded yarns 220. The extending portions of the first seaming element 100a are interdigitated between the extending portions of the second seaming element 100b, and are then connected together and secured by a pinte 700.

The seaming element 100 of the invention has a caliper, i.e. measured from the plane of the outer surfaces of each of the segments 112 through the element to the plane of the outer surfaces of each of the segments 122, approximately equal to that of the fabric into which it is to be installed so as to minimize any possible discontinuity in fabric caliper arising from its installation. The seaming element is formed from a single thermoplastic yarn, such as a polymeric monofilament, which has been permanently deformed, for example by wrapping it about an appropriate jig so as to obtain the desired shape, and then subjecting the deformed
yarn to heat and pressure so as to permanently plastically deform it to the desired shape configuration, having regard to the yarn or MD component density of the base fabric into which it is to be installed, and the size of the yarns or MD components in the base fabric. The sizing of the seaming element 100 will be described in relation its installation in a woven fabric; however, it is to be understood that the fundamental principles relating to the sizing of the loops of the seaming element apply equally when it is installed in a nonwoven fabric, such as one formed from strips or layers of a film, or a fibrous material. In such cases, the MD components of the fabric may be formed by cutting apertures and land areas into the base fabric along the fold lines as described, for example, by Despault in WO 2007/062506. Other methods of forming the apertures may provide satisfactory results.

The seaming element 100 is dimensioned so that the looped segments 112, 122 can fit between, and protrude between, at least a portion of the one or more MD 220 yarns in the fold region 230 of the base fabric 200 and then be securely retained in that position so that the connecting portions 150 and the portions of the looped segments 112, 122 which provide the seaming channel 155 protrude beyond the fabric fold area 230. The yarn size used in the seaming element can be less than, equal to, or greater than the size of the yarns used in the multiaxial fabric into which it is installed. However, its size as well as the dimensions of the looped outer free ends 115 and 125 will preferably be determined in accordance with the following relationship:

\[ D_s \leq \frac{1}{M} - d_w \]

where:

- \( D_s \) is the yarn diameter used in the seaming element seaming element 100;
- \( d_w \) is the diameter of the MD yarn 220 in the fabric 200 (or the size of MD components at the folder area 230); and
- \( M \) is the fabric mesh, in yarns per unit width (or the spacing of the MD components) of the base fabric.
For example, for a fabric having a mesh of 22 MD yarns per inch of fabric width, and an MD yarn diameter of 0.40mm can accommodate a seaming element whose yarn diameter is (converting 22 yarns/in to yarns/mm):

\[ D_x \leq (25.4/22) - 0.40\text{mm} = 0.75\text{mm} \]

For a similar fabric, having a mesh of 20 MD yarns per inch and an MD yarn diameter of 0.40mm, the maximum yarn diameter of the seaming element will be:

\[ D_x \leq (25.4/20) - 0.40\text{mm} = 0.87\text{mm} \]

However, in order that one seaming element can be successfully mated with another of the same size attached to the opposite fabric end without deforming or otherwise crowding the connecting portions 150, the size of the yarn used in the seaming element, \((D_x)_{\text{max}}\), would be governed by the following relationship:

\[(D_x)_{\text{max}} = 1 / 2M\]

Returning to the first example, a fabric having a mesh of 22 yarns per inch may be able to accommodate a seaming element formed from a yarn that is as large as 0.75mm, but the yarn size required for a smooth join without any deformation of the fabric fold or seaming element will be:

\[(D_x)_{\text{max}} = 25.4 / 2(22) = 0.57\text{mm}\]

For a similar fabric, having a mesh of 20 yarns per inch, the maximum size of the yarn \((D_x)_{\text{max}}\) used in the seaming element which will allow for closure of the element without any deformation of the fabric fold area or seaming element used at each end of the fabric will be:

\[(D_x)_{\text{max}} = 25.4 / 2(20) = 0.63\text{mm}\]
These relationships indicate that the maximum yarn size that can be used to form a seaming element that will fit in the fabric fold area and allow the seaming element to be joined without deformation will be less than the maximum yarn size the fabric fold area can dimensionally accommodate without distortion. Generally, the size of the yarn which may be used in a seaming element, which will allow it to be joined to another similar element while maintaining without distortion the shape of both elements, will be about 25% less than the size of seaming element yarn that a fabric can actually accommodate.

The yarn used in the seaming element can be formed from any suitable material, including polyesters, such as PET, PBT, PEN and the like, polyamides, such as any of the nylon commonly used in industrial textiles including nylon-6, nylon-66, nylon-6/10, and so on, as well as other polymers commonly used in the manufacture of such textiles. The seaming element may also be made from a metal wire, such as stainless steel or other suitable metals. The yarns used to form the seaming element must be capable of permanent deformation into the required shape, and must have sufficient strength to prevent their fracture when subjected to the tensile forces to which the fabric is exposed while in use. The yarns are at present preferably comprised of a single monofilament; however, cabled monofilaments, or sheath-core yarns in which the core is formed from a single monofilament or several monofilaments cabled together, and the sheath is comprised of a material having a lower melt point than the core, which yarn is capable of permanent thermoplastic deformation under heat and pressure, may be used. Other materials and configurations may be possible.

While the seaming element of this invention has been described for use in woven fabrics, or fabrics provided with one or more MD yarn systems, it is not so limited, and may be employed in fabrics comprised entirely of a nonwoven material, such as a film, a plurality of film strips such as a slit film, or other fibrous structures such as are known. All that is required for the seaming element to be effective in such fabrics is the provision of adequate anchorage for the free ends of the element in the fabric. The seaming element may thus find use in a variety of textiles, and may be used to join fabric components in both the MD (i.e. as
a cross-machine direction oriented seaming element) or the CD (as a machine direction oriented seaming element). In the latter orientation, the seaming element may be useful for attaching MD oriented fabric strips together in the longitudinal direction, or for attaching reinforcing or other materials to the outer edges of a woven or nonwoven fabric.
CLAIMS

1. A seaming element for seaming an industrial textile, the industrial textile comprising a first folded end region having a first fold line, a second folded end region having a second fold line, wherein portions of the industrial textile adjacent to the first and second fold lines respectively define first and second internal spaces, and each of the first and second fold lines comprise a plurality of spaced apart apertures, the seaming element being a continuous filamentary structure deformedly set in an elongated configuration and comprising a plurality of looped segments having outer free ends and being alternated with connecting portions, wherein

(i) each connecting portion is configured to separate adjacent ones of the looped segments alternately into a first layer of looped segments and a second layer of looped segments;
(ii) the looped segments of the first layer are aligned with each other at their respective outer free ends, and the looped segments of the second layer are aligned with each other at their respective outer free ends;
(iii) each connecting portion is spaced apart from each adjacent connecting portion; and
(iv) the seaming element is constructed and arranged to be insertable into and securable within the first internal space, such that
(a) the connecting portions and portions of each of the first looped segments and each of the second looped segments protrude through the apertures along the first fold line;
(b) the textile body between the apertures along the first fold line engages with the aligned outer free ends of the first and second looped segments; and
(c) the connecting portions of the seaming element are engageable with the corresponding connecting portions of a complementary seaming element correspondingly provided at the second folded end region, such that the connecting portions are securably aligned together to define a continuous longitudinal channel.

2. A seaming element according to Claim 1, wherein the industrial textile comprises yarns, and the textile body between the apertures along each fold line comprises selected folded ones of the yarns.
3. A seaming element according to Claim 2, wherein the industrial textile is a woven industrial textile.

4. A seaming element according to any one of Claims 1 to 3, wherein each of the looped segments of the first layer has a first segment length between its outer free end and the adjacent connecting portions, and each of the looped segments of the second layer has a second segment length between its outer free end and the adjacent connecting portions, and the second segment length is different from the first segment length.

5. An industrial textile comprising a pair of seaming elements according to any one of Claims 1 to 4.

6. An industrial textile according to Claim 5, wherein the two seaming elements have the same configuration as each other.

7. An industrial textile according to Claim 5, wherein the two seaming elements have a different configuration from each other.

8. An industrial textile according to any one of Claims 5 to 7, wherein the industrial textile is a papermakers fabric, and each seaming element is provided in a machine direction of the fabric.

9. An industrial textile according to any one of Claims 5 to 7, wherein the industrial textile is a papermakers fabric, and each seaming element is provided in a cross-machine direction of the fabric.

10. A method of making a seam for an industrial textile, the method comprising (i) providing a first folded end region having a first fold line and a second folded end region having a second fold line, to define first and second internal spaces between portions of the industrial textile adjacent to the first and second fold lines respectively;
(ii) providing along each of the first and second fold lines a plurality of spaced apart apertures between fabric body portions;
(iii) providing a first seaming element and a second seaming element, each according to one of Claim 1 and Claim 4;
(iv) inserting the first seaming element within the first internal space, and inserting the connecting portions and portions of each of the first looped segments and each of the second looped segments through the apertures to form a plurality of first protrusions from the first fold line such that the outer free ends of each of the first and second looped segments is engaged with the fabric body portions along the first fold line;
(v) inserting the second seaming element within the second internal space, and inserting the connecting portions and portions of each of the first looped segments and each of the second looped segments through the apertures to form a plurality of second protrusions from the second fold line such that the outer free ends of each of the first and second looped segments is engaged with the fabric body portions along the second fold line;
(vi) securing each of the first and second elements within the respective first and second internal spaces; and
(vii) bringing the first protrusions into engaged alignment with the second protrusions to define a continuous longitudinal channel and securing the first and second elements together to form the seam.

11. A method according to Claim 10, wherein the industrial textile comprises yarns, and step (ii) comprises removal of selected yarns substantially parallel to and at the fold line.

12. A method according to Claim 11, wherein the industrial textile comprises a woven industrial textile.

13. A method according to any one of Claims 10 to 12, wherein step (iii) comprises providing first and second seaming elements having the same configuration as each other.
14. A method according to any one of Claims 10 to 12, wherein step (iii) comprises providing first and second seaming elements having a different configuration from each other.