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(54) SLIDING CLASP FASTENER STRINGERS

(71) We, YOSHIDA KOGYO K.K., a corporation duly organized under the laws of Japan and existing at No. 1, Kanda Izumicho, Chiyoda-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to sliding clasp fasteners, and more specifically to improvements in the stringers of sliding clasp fasteners for particular use with fishing nets, tents, covering sheets of fabric used at sites of construction, and similar articles.

The stringer tapes of sliding clasp fasteners as heretofore made have been fine in gauge or mesh and are therefore not quite suitable for use with the above listed articles having portions where permeability to fluids is required or at least desirable. When conventional sliding clasp fasteners are employed for interconnecting sections of fishing nets or protective fabric coverings used at construction sites, for example, their fine gauged or meshed stringer tapes hardly permit the passage therethrough of currents of ocean water or air. The stringer tapes thus augment the pulling forces applied to the fasteners by the currents of fluids. Moreover, the stringer tapes are incapable of absorbing such intense cross-wise pulls, so that their connections to the article edges are particularly liable to be broken.

According to the invention, there is provided a sliding clasp fastener stringer tape supporting a row of fastener elements thereon, comprising a major region made of a net-like knitted fabric, said major region being longitudinally divided into a plurality of subregions of progressively finer mesh size from the one lying along one of the longitudinal edges of said major region toward the one lying along the other longitudinal edge thereof, and a relatively narrow element-carrying region extending along said other longitudinal edge of said

major region, said element-carrying region being made of a fabric with a finer gauge or mesh than the finest mesh subregion of said major region, said row of elements being mounted on said element-carrying region.

The invention will be described by way of example with reference to the accompanying drawings which illustrate some preferred embodiments of the invention and in which like reference characters, in which:

Figure 1 is a partial plan view of a pair of sliding clasp fastener stringers embodying this invention;

Figure 2 is a view similar to Figure 1 but showing the stringers with one of their tapes attached to a meshed article such as a fishing net;

Figure 3 is a partial plan view of a fastener stringer representing another preferred embodiment of this invention; and

Figure 4 is a view similar to Figure 3 but showing still another preferred embodiment of the invention.

A pair of sliding clasp fastener stringers shown in Figures 1 and 2 and generally designated 10 are representative of numerous possible embodiments of this invention. In Figure 1, the fastener stringers 10 comprise tapes 11 carrying interlocking rows of fastener elements 12 (shown as discrete scoops by way of example) which are shown coupled together. Each stringer tape 11 is broadly composed of a major region 13 made of a knitted fabric with an open, net-like formation, and an element-carrying region 14 of relatively small width made of a warp-knitted fabric.

The major region 13 of each stringer tape 11 is longitudinally subdivided into a plurality of, three in the illustrated embodiment, subregions 15, 16 and 17. The net-like formation of these subregions 15 to 17 becomes progressively finer in mesh from the one lying along one of the longitudinal edges of the major region 13 toward the one lying along the other longitudinal edge.

The element-carrying region 14 of each

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stringer tape extends along the said other longitudinal edge of the major region 13, so as to lie next to its finest mesh subregion 17. The warp-knitted fabric of which the scoop-carrying region 14 is made is finer in gauge or mesh than the subregion 17 of the major region 13 and can, for example, be a combination of tricot and crochet work. The fastener elements 12 are clamped or otherwise secured to this element-carrying region in the conventional manner.

With reference to Figure 2, in the use of the sliding clasp fasteners incorporating the pair of stringers 10 of the foregoing construction, the coarsest mesh subregions 15 of the major tape regions 13 may ordinarily be attached to the desired edges of an article 18 such as a fishing net by any suitable means. Preferably, the pitch of the meshes in the longitudinal direction of these coarsest mesh subregions should be made equal to the pitch of the meshes in the fishing net, or of eyelets in fabric coverings or the like, in order that the fastener stringers may be attached to such articles more easily and more neatly.

Figure 3 illustrates another preferred embodiment of this invention, which differs from the preceding embodiment in that the tape 11a of each fastener stringer 10a has another warp-knitted fabric region 19 formed along the longitudinal edge of its major region 13 opposite to the scoop-carrying region 14. Due to the warp-knitted fabric regions 19, the pair of fastener stringers 10a can be attached to desired articles more easily by any such known method as stitching, bonding, or fusion welding. Furthermore, since the major region 13 of each stringer tape has its opposite longitudinal edges reinforced by the pair of warp-knitted fabric regions 14 and 19, the net-like texture of this major region can be stabilized.

In still another preferred embodiment of the invention illustrated in Figure 4, the tape 11b of each fastener stringer 10b has its major region 13b so knitted that its open, net-like formation has a tendency to be held in a transversely contracted state, as depicted by the solid lines in the drawing. In use the major tape region 13b can be expanded by crosswise pulling forces applied thereto by the article, as indicated by the two-dot dash lines in the same drawing.

Knitted in the above described manner, the major tape regions 13b of the fastener stringers 10b can have the same texture as that of, for example, fishing nets manufactured by known machines that are used exclusively for that purpose. The

fastener stringers 10b are therefore extremely easy to attach to such fishing nets and are also easy to handle.

It is to be understood that the invention is not to be restricted by the exact showings of the accompanying drawings or the description thereof. For instance, the fastener elements mounted on the element-carrying regions of the various stringer tapes are shown to be of the discrete type, but this is purely by way of example. Any other type of fastener elements, which may be made of either plastics or metal, can be employed depending upon the intended applications or expected working conditions of the fastener stringers.

WHAT WE CLAIM IS:—

1. A sliding clasp fastener stringer tape supporting a row of fastener elements thereon, comprising a major region made of a net-like knitted fabric, said major region being longitudinally divided into a plurality of subregions of progressively finer mesh size from the one lying along one of the longitudinal edges of said major region toward the one lying along the other longitudinal edge thereof, and a relatively narrow element-carrying region extending along said other longitudinal edge of said major region, said element-carrying region being made of a fabric with a finer gauge or mesh than the finest mesh subregion of said major region, said row of elements being mounted on said element-carrying region.
2. A stringer tape as claimed in claim 1, the fabric of which said element-carrying region is made being warp-knitted.
3. A stringer tape as claimed in claim 1, including another relatively narrow fabric region extending along said one longitudinal edge of said major region.
4. A stringer tape as claimed in claim 3, said other fabric region being warp-knitted.
5. A stringer tape as claimed in claim 1, said major region being so knitted as to have a tendency to be held in a transversely contracted state.
6. A stringer tape substantially as herein described with reference to and as illustrated in Figures 1 and 2 of the accompanying drawings.
7. A stringer tape substantially as herein described with reference to and as illustrated in Figure 3 of the accompanying drawings.
8. A stringer tape substantially as herein described with reference to and as illustrated in Figure 4 of the accompanying drawings.

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stringer tape extends along the said other longitudinal edge of the major region 13, so as to lie next to its finest mesh subregion 17. The warp-knitted fabric of which the scoop-carrying region 14 is made is finer in gauge or mesh than the subregion 17 of the major region 13 and can, for example, be a combination of tricot and crochet work. The fastener elements 12 are clamped or otherwise secured to this element-carrying region in the conventional manner.

With reference to Figure 2, in the use of the sliding clasp fasteners incorporating the pair of stringers 10 of the foregoing construction, the coarsest mesh subregions 15 of the major tape regions 13 may ordinarily be attached to the desired edges of an article 18 such as a fishing net by any suitable means. Preferably, the pitch of the meshes in the longitudinal direction of these coarsest mesh subregions should be made equal to the pitch of the meshes in the fishing net, or of eyelets in fabric coverings or the like, in order that the fastener stringers may be attached to such articles more easily and more neatly.

Figure 3 illustrates another preferred embodiment of this invention, which differs from the preceding embodiment in that the tape 11a of each fastener stringer 10a has another warp-knitted fabric region 19 formed along the longitudinal edge of its major region 13 opposite to the scoop-carrying region 14. Due to the warp-knitted fabric regions 19, the pair of fastener stringers 10a can be attached to desired articles more easily by any such known method as stitching, bonding, or fusion welding. Furthermore, since the major region 13 of each stringer tape has its opposite longitudinal edges reinforced by the pair of warp-knitted fabric regions 14 and 19, the net-like texture of this major region can be stabilized.

In still another preferred embodiment of the invention illustrated in Figure 4, the tape 11b of each fastener stringer 10b has its major region 13b so knitted that its open, net-like formation has a tendency to be held in a transversely contracted state, as depicted by the solid lines in the drawing. In use the major tape region 13b can be expanded by crosswise pulling forces applied thereto by the article, as indicated by the two-dot dash lines in the same drawing.

Knitted in the above described manner, the major tape regions 13b of the fastener stringers 10b can have the same texture as that of, for example, fishing nets manufactured by known machines that are used exclusively for that purpose. The

fastener stringers 10b are therefore extremely easy to attach to such fishing nets and are also easy to handle.

It is to be understood that the invention is not to be restricted by the exact showings of the accompanying drawings or the description thereof. For instance, the fastener elements mounted on the element-carrying regions of the various stringer tapes are shown to be of the discrete type, but this is purely by way of example. Any other type of fastener elements, which may be made of either plastics or metal, can be employed depending upon the intended applications or expected working conditions of the fastener stringers.

WHAT WE CLAIM IS:—

1. A sliding clasp fastener stringer tape supporting a row of fastener elements thereon, comprising a major region made of a net-like knitted fabric, said major region being longitudinally divided into a plurality of subregions of progressively finer mesh size from the one lying along one of the longitudinal edges of said major region toward the one lying along the other longitudinal edge thereof, and a relatively narrow element-carrying region extending along said other longitudinal edge of said major region, said element-carrying region being made of a fabric with a finer gauge or mesh than the finest mesh subregion of said major region, said row of elements being mounted on said element-carrying region.

2. A stringer tape as claimed in claim 1, the fabric of which said element-carrying region is made being warp-knitted.

3. A stringer tape as claimed in claim 1, including another relatively narrow fabric region extending along said one longitudinal edge of said major region.

4. A stringer tape as claimed in claim 3, said other fabric region being warp-knitted.

5. A stringer tape as claimed in claim 1, said major region being so knitted as to have a tendency to be held in a transversely contracted state.

6. A stringer tape substantially as herein described with reference to and as illustrated in Figures 1 and 2 of the accompanying drawings.

7. A stringer tape substantially as herein described with reference to and as illustrated in Figure 3 of the accompanying drawings.

8. A stringer tape substantially as herein described with reference to and as illustrated in Figure 4 of the accompanying drawings.

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