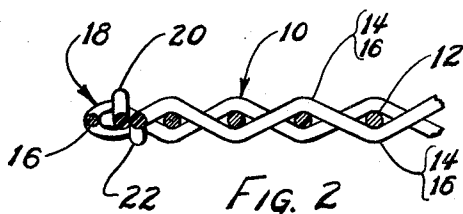
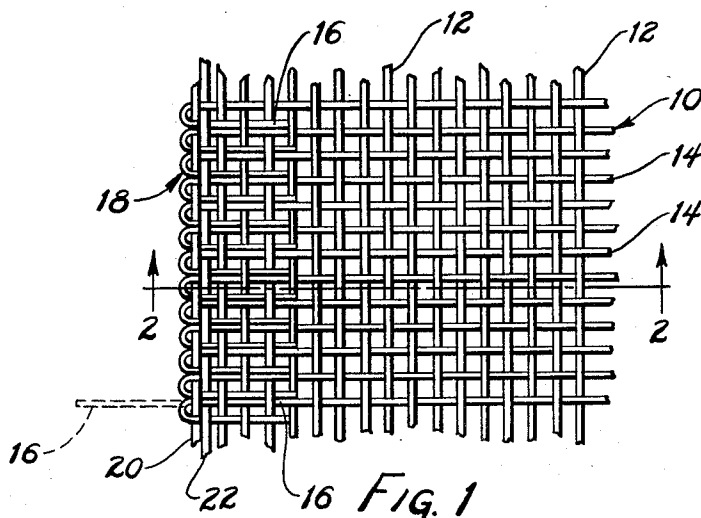


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WOVEN FABRIC CONSTRUCTION
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WOVEN FABRIC CONSTRUCTION

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4 Claims. (Cl. 139—425)

This invention relates to improvements in a woven fabric construction and, more particularly, to improvements in the selvage edge construction of a woven fabric.

While not limited thereto, the present invention is particularly adapted to being used in woven metallic fabric such as insect screening. Moreover, the success of the new construction stems largely from the warp and weft filaments of the fabric being formed from material such as metallic wire which, when bent, will retain the new shape to which the filament has been bent. However, there are other types of filaments which function similarly such as certain of the synthetic resin filaments and, where the use of such other types of filaments is possible or desirable, the present invention is intended to include such filaments within its scope.

Conventional textile fabrics principally are woven by disposing an endless weft thread in woven relationship with the warp threads of the fabric. Weaving of this nature however requires bobbins upon which the weft thread is wound, the bobbins being disposed in the shuttle which passes through the shed formed by the warp threads or strands during the weaving operation. In weaving of this type however, when the thread or strand of textile material upon the bobbin becomes exhausted, it is necessary to replace the empty bobbin with a filled one in the shuttle and this results in an interruption to the weaving operation.

Wire cloth such as insect screening also commonly has been formed by using a substantially continuous weft wire or strand initially wound upon a bobbin disposed in the shuttle of the loom. However, the interruption to the weaving process at the time of replacing an empty bobbin with a filled one is objectionable. Accordingly, looms and processes of weaving are currently used which are based upon the principle of two gripping members being respectively reciprocable from opposite sides of the loom toward the center thereof, one of the grippers pulling a weft wire or filament of indefinite length which may be wound upon a large single reel, substantially half way through the shed, at which time the opposite gripper engages the end of the weft wire or filament and pulls it through the remaining half of the shed, whereby a weft wire extends continuously across the shed between the opposite selvage edges thereof. The wire then is cut at the edge of the fabric from which the weft wire initially was fed and the operation is repeated. The cut or free ends of the weft wire or filament preferably project short distances beyond the extremities of the opposite selvage edges of the fabric being woven. In order to finish the fabric, it is necessary to suitably treat or manipulate said projecting ends of the weft wire or filament so that a smooth and acceptable selvage edge is provided at opposite sides of the fabric being woven.

The presently used arrangements for finishing such selvage edges of so-called cut weft fabrics comprise twisting the projecting ends of the weft wires around the outermost warp wires or filaments for example, bending said projecting weft ends into engagement with one or more

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of the outermost warp wires at the selvage and welding said ends of the weft wires thereto, or using solder in lieu of welding to connect the bent weft ends to said outermost selvage wires or filaments. These operations require complicated and relatively expensive looms to produce fabric which has a commercially acceptable selvage construction at opposite edges thereof. Further, certain fabrics of this type are objectionable in that the sharp cut ends of the weft wires or filaments are disposed in such relationship to the outer surfaces of the fabric that the selvage has a roughness or coarseness capable of scratching anyone handling the selvage of the fabric.

It is the principal object of the present invention to provide fabric woven from predetermined lengths of weft wires or other types of filaments, the opposite ends of which are cut and initially project beyond the outermost warp wires or filaments but are bent inwardly so as to be tucked into the selvage at opposite edges of the fabric being woven, the tucked ends of the weft wires or filaments being woven between a limited number of the warp wires or filaments adjacent the outer edges of the selvage incident to weaving the fabric, whereby the fabric may be formed upon a relatively simple loom not requiring complicated and expensive twisting mechanism, or welding or soldering equipment as commonly is required at present in the production of so-called cut weft fabrics.

Still another object of the invention is to provide a fabric such as described above with stabilizing means preferably in the outermost edges of the selvage at each edge of the fabric, said stabilizing means retaining the tucked ends of the cut weft wires or filaments securely in the desired position in which they are formed when the fabric is woven.

Ancillary to the foregoing object, the stabilizing means, in the preferred embodiment thereof, comprises a pair of warp-like wires or filaments which are disposed in longitudinal juxtaposition to each other incident to the weaving of the fabric, whereby no additional operation is required to incorporate the stabilizing means within the fabric.

Details of the invention and the foregoing objects, as well as other objects thereof, are set forth in the following specification and illustrated in the accompanying drawing comprising a part thereof.

In the drawing:

Fig. 1 is a fragmentary plan view of a section of woven fabric embodying the principles of the present invention and illustrating a portion of one selvage edge of said section of fabric.

Fig. 2 is an enlarged sectional fragmentary view of the fabric shown in Fig. 1, taken on the line 2—2 of Fig. 1.

It is to be understood that the fabric illustrated in Figs. 1 and 2 of the drawing primarily is exemplary for purposes of illustrating the preferred construction, particularly of the selvage edges, only one such selvage edge being illustrated. As shown in Fig. 1, the fabric 10 comprises a plurality of preferably parallel warp strands or filaments which are spaced in accordance with conventional fabric of mesh-type such as insect screening. As stated above, the strands or filaments 12, as well as the weft strands or filaments 14, preferably are formed from material which is flexible, yet is capable of being bent and will retain substantially the shape to which it has been bent. Metal wire such as steel, bronze, copper, aluminum, and other suitable material, either plated, coated, or uncoated, as desired, is admirably suited for the warp and weft strands or filaments 12 and 14. Further, these strands or filaments may be formed from other suitable material such as certain synthetic resins which have physical characteristics suitable to permit bending of the strands or filaments into desired shapes at certain locations in the

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fabric for purposes of producing the benefits of the invention.

For purposes of simplifying the description of the invention, it will be assumed that the warp and weft strands or filaments 12 and 14 comprise suitable metallic wire but the invention is not to be restricted to the use of this type of material only.

In Figs. 1 and 2, only a portion of one selvage edge of a strip or sheet of fabric is illustrated. It will be understood however that the opposite edge of said strip or sheet of fabric 10 will be similar to that illustrated in Figs. 1 and 2. The warp wires or filaments 12 will be assumed to be of indefinite lengths and the weft wires or filaments 14 are separate from each other and comprise wires which have individually been cut from a reel of such wire after insertion of each weft wire through the shed comprising the separated warp wires 12.

The length of each of the weft wires or filaments 14 preferably is a little greater than the width of the fabric 10, whereby the opposite ends 16 originally project a predetermined distance beyond the extremity of the selvage edge 18 of the fabric 10, one example of such projecting cut weft end being shown in dotted lines in the lower portion of Fig. 1.

In the course of the operation of the loom which weaves the fabric 10, said projecting cut weft ends 16 are bent substantially 180° from the projecting position illustrated in dotted lines in Fig. 1, to the full line positions thereof illustrated in said figure. Depending upon the nature of the loom, it may be that the inwardly bent or tucked ends 16 of the weft wires or filaments 14 may not be fully bent to the full line positions thereof illustrated in Fig. 1. However, upon the positioning of the next weft wire or filament through the shed and the next reciprocation of the beat-up mechanism, said last mentioned weft wire or filament will be pushed against the inwardly bent ends 16 and complete the bending thereof to final position illustrated in full lines in Fig. 1 in the event such complete bending has not taken place already.

Preferably, the length of the projecting cut ends 16 of the weft wires or filaments is such that when they are bent into the full line position shown in Fig. 1, they will extend across a limited number of the warp wires or filaments 12 of the order of the number illustrated in Fig. 1. It will be seen from said figure that the inwardly bent and tucked ends 16 extend substantially in parallel arrangement with the adjacent weft wires or filaments 14, all of these being crenelated incident to the weaving operation as illustrated in side sectional elevation in Figure 2. Such crenelation aids in maintaining the tucked cut ends 16 in operative position within the selvage edge 18 of the fabric 10.

Further to stabilize the cut and tucked ends 16 of the weft wires or filaments 14, the present invention, in its preferred embodiment, includes stabilizing means preferably disposed adjacent the outer extremity of the selvage edges 18. One preferred form of stabilizing means is illustrated specifically in Figs. 1 and 2 and comprises a pair of stabilizing warp wires or filaments 20 and 22 which are also preferably disposed in longitudinally juxtapositioned arrangement to each other. In the weaving of the fabric, the stabilizing warp wires or filaments 20 and 22 may be fed from separate reels or drums, or may be disposed upon the warp drum which carries the strands or filaments 12. However, no additional operation or function is required to incorporate the stabilizing warp wires or filaments 20 and 22 within the selvage edges of the fabric and the beat-up operation anchors the stabilizing warp wires or filaments 20 and 22 relative to the weft strands or filaments 14 as well as the cut ends 16 thereof by intercrenelating the same by the weaving operation.

While the stabilizing warp wires or filaments 20 and 22 have been shown in the drawing as being substantially the same diameter as the warp wires or filaments 12, it has

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been found that said stabilizing warp wires or filaments may be of smaller diameter than the warp wires or filaments 12 if desired and yet will function to anchor the inwardly bent and tucked cut ends 16 of the weft wires or filaments 14.

From the foregoing, it will be seen that the present invention provides a woven fabric which may be made in indefinite lengths by utilizing warp strands or filaments of similar length but individually separate weft strands or filaments of predetermined length interwoven with said warp strands or filaments. A predetermined length of the individual weft strands or filaments originally project beyond the selvage edges of the fabric but are bent inwardly and are tucked and interwoven with a limited number of the outermost warp strands or filaments which interweaving aids in anchoring and fixing said tucked weft ends within the selvage edges of the fabric but, in addition, the tucked weft ends are further stabilized by preferably using supplemental means, one example of which comprises specifically illustrated stabilizing warp wires or filaments disposed at the outermost parts of the selvage edges of the fabric. The inherent nature of the wires, strands or filaments which comprise the weft members of the fabric and also the warp members of the fabric is such that preferably the inwardly bent, tucked and interwoven cut ends of the weft members subsequently remain in the positions to which they have been bent, notwithstanding the stabilizing means and the interwoven arrangement in the selvages of the fabric.

Further, the stabilizing filaments preferably are in longitudinal abutting relationship to each other and respectively are oppositely woven relative to the weft wires or filaments.

While the invention has been shown and illustrated in its preferred embodiment, and has included certain details, it should be understood that the invention is not to be limited to the precise details herein illustrated and described since the same may be carried out in other ways falling within the scope of the invention as claimed.

I claim:

1. Insect screening fabric and the like woven from flexible metallic wire filaments and comprising in combination, a plurality of parallel warp wire filaments, a plurality of separate and substantially parallel weft wire filaments woven through said warp filaments transversely thereto and of greater length than the width of the fabric, the ends of said weft filaments being bent inwardly at the outer extremity of the selvage substantially into parallelism with the adjacent weft filaments and interwoven between a limited number of spaced successive warp filaments of the selvage of the fabric, whereby said ends are tucked between said warp filaments and the selvage edges of the fabric resemble the selvage edges of conventional fabric having a continuous weft filament, and a pair of warp-like wire stabilizing filaments disposed in the selvage and parallel to the other warp filaments, said stabilizing filaments being in side-by-side abutting relationship to each other and also being respectively oppositely woven relative to said weft filaments and inwardly bent ends thereof, thereby firmly positioning the inwardly bent ends of said weft filaments in woven position within the fabric selvage.

2. Insect screening fabric and the like woven from flexible metallic wire filaments capable of being bent and of retaining such bent shape when formed into a woven fabric, said fabric comprising in combination, a plurality of such wire filaments arranged in spaced parallel relationship to comprise the warp of said fabric, and a plurality of such wire filaments separate from each other and woven as weft through said warp filaments transversely thereto, said separate weft wire filaments being of greater length than the width of the fabric and the ends of said weft filaments being bent inwardly to form a U-shaped end with substantially parallel sides at the outer extremity of the fabric selvage and being inter-

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woven into crenelated shape between a limited number of spaced successive warp filaments adjacent the selvage edge of the fabric, whereby said ends are tucked between said selvage warp filaments to secure the same in tucked position and the selvage edges of the fabric resemble the selvage edges of conventional fabric having a continuous weft filament.

3. Insect screening fabric and the like woven from flexible metallic wire filaments capable of being bent and of retaining such shape after bending, said fabric comprising in combination, a plurality of such wire filaments arranged in spaced parallel relationship to comprise the warp of said fabric, and a plurality of such wire filaments separate from each other and woven as weft through said warp filaments transversely thereto, said separate weft wire filaments being of greater length than the width of the fabric and both ends of said weft filaments being bent inwardly respectively at opposite edges of said fabric to form a U-shaped end with substantially parallel sides at the outer extremities of the fabric selvages and said weft ends being interwoven into crenelated shape between a limited number of spaced successive warp filaments adjacent the selvage edge of the fabric, whereby said ends are tucked and woven between said selvage warp filaments to secure the same in tucked position and the selvage edges of the fabric resemble the selvage edges of conventional fabric having a continuous weft filament.

4. Insect screening fabric and the like woven from flexible metallic wire capable of being bent and of retaining such shape after being, said fabric comprising in combination, a plurality of strands of such wire arranged

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in spaced parallel relationship to comprise the warp of said fabric, a plurality of strands of such wire separate from each other and woven as weft through said warp wires transversely thereto, said separate weft wires being of greater length than the width of the fabric and the ends of said weft wires being bent inwardly to form a U-shaped end at the outer extremity of the fabric selvage and said weft ends being interwoven between a limited number of spaced successive warp wires adjacent the selvage edge of the fabric, whereby said ends are tucked between said spaced successive selvage warp wires to secure the same in tucked position and the selvage edges of the fabric resemble the selvage edges of conventional woven wire fabric having a continuous weft filament, and a pair of warp-like stabilizing filaments disposed outermost in the selvage and parallel to the warp wires, said stabilizing filaments being in side-by-side abutting relationship to each other and respectively oppositely woven relative to said weft wires and tucked ends thereof, thereby firmly positioning the inwardly bent ends of said weft wires in the woven position thereof within the selvage of the fabric.

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