This invention relates to improvements in methods of and seams for joining fabric-sections and in articles of manufacture having fabric-sections joined by stitched seams.

In the manufacture of high-grade raincoats and other such articles, in which the proximate margins of fabric-sections are united by stitched seams, difficulty has been experienced heretofore in providing a seam which would be completely watertight. It has been found that much of the leakage which persisted in prior seams was due to the fact that the stitches used therein were exposed upon the inner and outer surfaces of the garment and as a consequence the stitches acted as wicks to carry moisture from the outside of the garment to the inside thereof.

The principal object of this invention is to provide a new watertight seam for sewn articles, which is particularly adapted for joining sheets of waterproof material and is constructed so that the stitches thereof are protected from moisture.

The invention will be understood from the following description, in connection with the accompanying drawing which illustrates the improved seam and the method of joining fabric-sections and in which:

Fig. 1 represents two superimposed fabrics with their edges bound by a strip of waterproof material and having a line of straightaway stitches uniting all four plies of material, comprising an initial step in the formation of a waterproof seam.

Fig. 2 illustrates a second step in the forming of a waterproof seam which step is made by folding the upper fabric ply of Fig. 1 partially about the line of stitches.

Fig. 3 represents a perspective view of the finished seam formed by folding the lower tape edge of the binding strip of Fig. 2 about the line of stitches and securing the same against the fabric by adhesive means.

Fig. 4 illustrates the three-ply structure of the binding material.

Referring to Fig. 1 of the drawing, the fabric-sections or sheet 10 and 11 to be joined are superimposed one upon the other so that the edge portions which are to be seamed are in juxtaposed relation. Preferably a heat-softenable tape 12 of the vinyl resin type is then folded about the juxtaposed fabric edge portions to form a binding ply having the marginal edge portion thereof extending along the lower surface of the fabric-section 10 to a greater distance from the juxtaposed edges than does the edge portion 14 which extends along the upper surface of fabric-section 11.

A line of straightaway stitches 15 is then formed in the fabric-sections and tape plies so as to unite all four plies thereof. The uniting of the overlapping margins of the fabric-sections 10 and 11 with the binding ply of the tape 12, as described, constitutes an initial step in the joining of said fabric-sections, and the uniting stitches 15, made by hand or by machine, may be of any suitable or preferred form.

The seam is then opened, Fig. 2, by folding that fabric-section 11 which is in contact with the shorter tape portion 14 substantially 180° about the line of stitches 15.

In order to have the stitches completely enclosed within the seam, the longer marginal portion 13 of the tape 12 is thereafter folded backwards about a line 16 substantially removed from but parallel to the initial joining seam 15 so as to form a covering ply which extends over the already covered juxtaposed fabric edges to engage the other fabric section 11. By thus folding the tape 12 about a line 16 which is well removed from the line of stitches 15 it will be insured that the stitches will be properly covered and sealed by the tape.

In the final operation, a heated pressing tool is applied to the seam to cause the heat-softenable tape 12 to become soft and adhesive and in such condition it will, under pressure of the tool, adhere to the respective fabric-sections 10 and 11 thereby to effect a sealed water-tight seam. In this operation care must be taken to insure that the portion of the tape 12 which is in engagement with the fabric-section 10 and disposed between the line of stitches 15 and the line 16 is properly pressed into place, thereby to prevent any moisture from reaching the stitches 15.

In a preferred form of this type of seam the under surfaces of the fabric-section shown in Figs. 2 and 3 are coated with a plastic film of the vinyl resin type, which film also softens and fuses with the tape 12 when the heated tool is applied to the seam. However, the tape 12 could be made of a water-resistant fabric and could be secured to the fabric-sections by means of a coating of adhesive.

When it is stated herein that the tape 12 is fused upon the fabric-sections it is meant that the tape is softened by heat while disposed upon the fabric-sections, so that a portion of the heated tape will intimately flow into the indentations of the fabric-sections and adhere thereto, thereby to effect a seal.
When applied to raincoats, the seam face shown in Fig. 3 which bears the exposed portion of the seam is preferably worn to the inside of the garment.

The heat-softenable tape 12 may comprise a single ply of a vinyl type resin strip or may, as illustrated in Fig. 4, comprise three plies of material; the middle ply 17 being scrim and the outer two plies 18 being binding strips. The three plies of this strip are fused into a single pliable tape which is easier to handle than the pure vinyl tape as the latter, when in its form of thin strips, is subject to static electricity.

From the above description it is to be understood that by fusing the tape 12 over the line of stitches 16 and upon the fabric-sections 10 and 11 moisture is prevented from coming in contact with the stitches or from seeping between the plies of the fabric-sections. Thus a watertight seam is formed. It will also be understood that the present invention, in its broader aspects, is not limited to any specific means for uniting the fabric-sections, nor is it limited to any specific seam formation in its more limited sense.

It is therefore thus set forth the nature of the invention, what I claim herein is:

1. The method of forming a finishing seam, comprising placing a binding tape about the edge portions of superimposed fabric-sections, uniting said fabric-sections and said tape by a line of stitches, separating said fabric-sections by folding one fabric-section 180° about said line of stitches, folding that free edge portion of the binding tape which underlies the unfolded fabric-section about said line of stitches and placing the same against the folded fabric-section, and adhesively securing said binding tape and said fabric-sections together.

2. The method of forming a finishing seam, comprising placing a binding tape about the juxtaposed edge portions of superimposed fabric-sections so that one edge of the tape extends a greater distance from the juxtaposed edges of the fabric-sections than the other, uniting said fabric-sections and said tape by a line of stitches, separating said fabric-sections by folding that fabric-section which is in contact with the narrow tape edge portion 180° about said line of stitches, folding the wide tape edge portion about a line at one side of said stitches and placing the same against the folded fabric-section, and securing said binding tape and said fabric-sections together by an adhesive means.

3. The method of forming a seam, comprising placing a heat-softenable binding tape about the juxtaposed edge portions of two superimposed fabric-sections so that one edge of the tape extends a greater distance from the edges of the fabric-sections than the other, uniting said fabric-sections and said tape by a line of stitches, separating said fabric-sections by folding that fabric-section which is in contact with the narrow tape edge portion substantially 180° about said line of stitches, folding the wide tape portion about a line at one side of said line of stitches and placing the same upon the folded fabric-section, and adhesively securing the binding tape upon said fabric-sections by means of heat and pressure.

4. The method of forming a seam, comprising placing the proximate margins of two fabric-sections in juxtaposition with the body portion of each fabric-section extending in an opposite direction from the other, enclosing the lapped marginal portion of at least one of said fabric-sections within a strip of heat-softenable material, uniting the two fabric-sections and the strip of heat-softenable material by a line of stitches, placing a covering ply of heat-softenable material across the lapped margins of the fabric-sections to cover the exposed stitches on one side of the seam, and adhesively securing the heat-softenable material in place by means of heat and pressure.

5. A seam, comprising a first sheet of material, a second sheet of material having a margin thereof turned, said turned margin being in juxtaposition with a margin of said first sheet, the body portion of each sheet extending in an opposite direction from the other, a line of stitching passing through said first sheet and the inturned margin of said second sheet, a binding tape having a first edge portion thereof disposed between the inturned margin and the body portion of said second sheet, said binding tape extending about the juxtaposed sheet edges to lie against the marginal portion of said first sheet and said second sheet, said binding tape and said sheets for securing the contacting portions together.

6. A seam comprising a first sheet of material, a second sheet of material having a margin thereof turned, said turned margin being in juxtaposition with a margin of said first sheet, the body portion of each sheet extending in an opposite direction from the other, a line of stitching passing through said first sheet and the inturned margin of said second sheet, a binding tape having a first edge portion thereof disposed between the inturned margin and the body portion of said second sheet, said binding tape extending about the juxtaposed sheet edges to lie against the body portion of said second sheet, and adhesively securing said binding tape and said sheets for securing the contacting portions together.

7. A seam, comprising a first sheet of material, a second sheet of material having a margin thereof turned, said turned margin being in juxtaposition with a margin of said first sheet, the body portion of each sheet extending in an opposite direction from the other, a heat-softenable binding tape having a first edge portion thereof disposed between the inturned margin and the body portion of said second sheet, said binding tape extending about the juxtaposed sheet edges to lie against the marginal portion of said first sheet, and a line of stitches passing through said first sheet, said binding tape being folded back on itself to cover the line of stitches and to lie against the body portion of said second sheet, said binding tape being adhesively secured to said first and second sheets of material.

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