

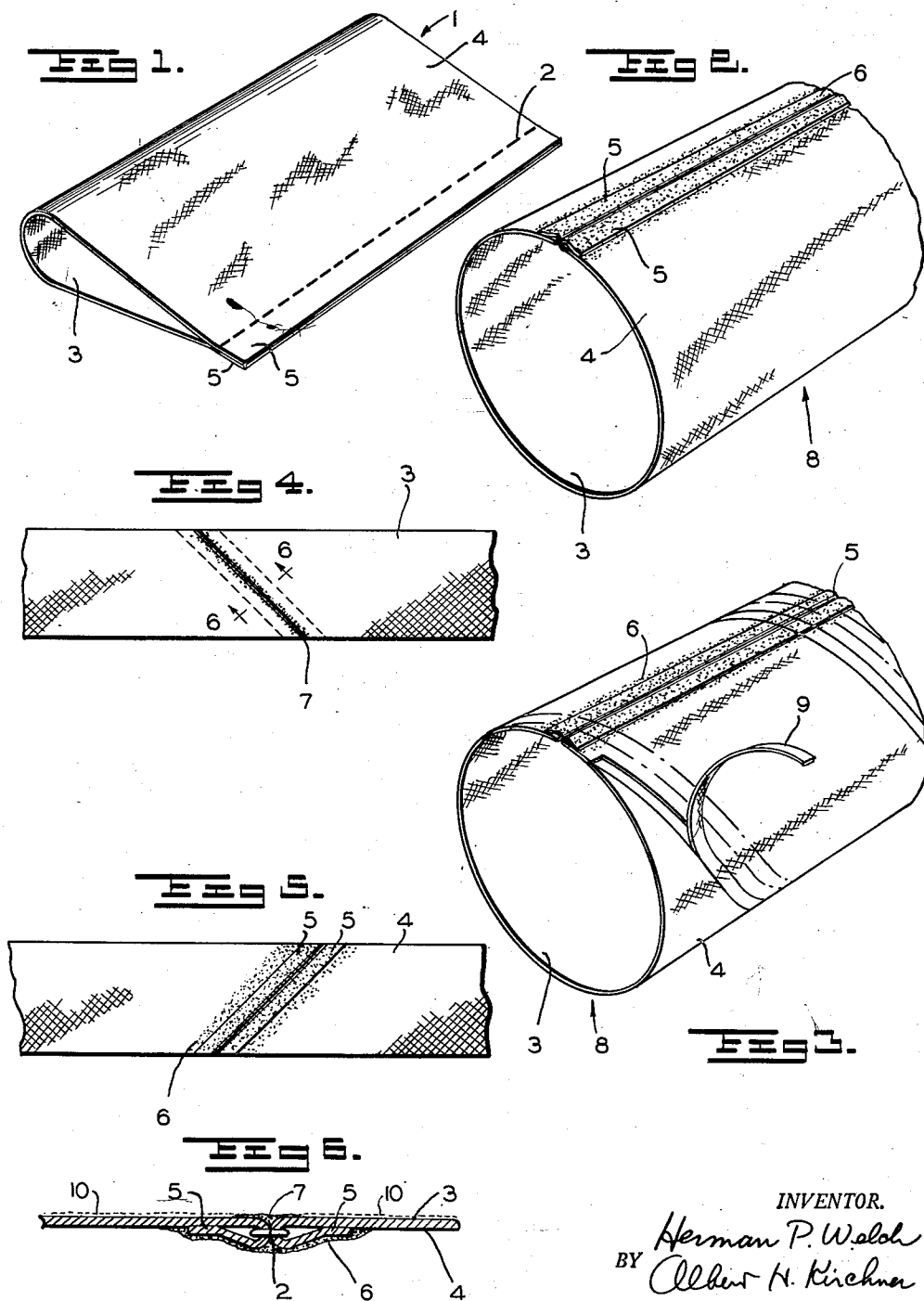
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BIAS WOVEN NARROW FABRIC

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BIAS WOVEN NARROW FABRIC

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1

The present invention relates to coated fabrics and its principal object is to produce a bias woven narrow strip of such fabric in indefinite length.

The invention constitutes an improvement over the subject matter of U. S. Patent No. 2,059,792, issued November 3, 1936, to the present assignee by assignment from Clarence B. Hill.

As explained in the Hill patent, narrow strips of fabric coated with pyroxylin or analogous material are extensively used in the making of welts, gimps, bindings and related articles in which it is necessary to dispose the article, and hence the narrow strip, around turns of short radius in the plane of the strip. To negotiate such turns without objectionable kinking or puckering, it is necessary that the textile fabric which comprises the body of the strip and serves as the foundation or backing for the surface coating be woven or cut on the bias. This means that the threads are arranged at substantially forty-five degrees to the lengthwise edges of the strip, which greatly facilitates smooth bending or curving the strip. It is impractical to weave on the bias, and difficulties are presented when square woven cloth is bias cut because it then becomes necessary to sew or otherwise fasten the ends of the cut sections together to produce the necessary strip of long or indefinite length. It is necessary to join sections together because the diagonal cutting of a flat sheet woven as wide as the loom will permit results in separate strips which are much too short to be used commercially in welt, gimp or binding making where economical operation of the machines and the demands of the trade require that the product be made in uninterrupted lengths of a hundred yards or more.

The subject of the Hill patent, and other methods which have been practiced or attempted to be practiced in this art, involve cutting the flat yard goods diagonally and thereafter sewing the resultant strips end to end. The present invention provides an improvement which comprises first sewing the yard goods into tubular form, then applying an adhesive or cement to the joint, and thereafter spirally cutting the tube to peel off from it a continuous, uninterrupted narrow strip in which the threads cross each other on the bias and which is characterized by regularly spaced diagonally extending joints which are secure and inconspicuous.

To this end the invention comprises, in certain preferred forms of embodiment, the method and the product which are illustrated in the accom-

2

panying drawing and which are defined by the appended claims. But the invention is to be understood as not limited to these specific embodiments, since it is capable of being practiced otherwise within the scope of the claims.

Referring to the drawing,

Figure 1 is a perspective view of a piece of coated yard goods with its longitudinal margins folded over on to each other and sewed together in accordance with the first step of the method;

Fig. 2 is a perspective view of the material of Fig. 1 with the edges of the material at the seam folded back on the body of the goods and cemented thereto, in accordance with the second step of the method;

Fig. 3 is a similar view showing how the strip of bias woven material is spirally cut from the tubular body;

Fig. 4 is a top plan view of a short length of the final product showing one of the joints therein;

Fig. 5 is a bottom plan view of the length shown in Fig. 4; and

Fig. 6 is a cross sectional view, taken on the line 6—6 of Fig. 4, greatly enlarged and somewhat distorted to show clearly the relationship of the parts at the joint.

In these drawings the reference numeral 1 designates a strip of yard goods of square woven coated material which has been folded along its longitudinal center line to bring its lengthwise edges in accurately superposed relation for joining in a lap seam by means of a line of stitching 2. The material is available from the looms and coating machines in wide strips of great length. The product is the kind commonly called imitation leather, having on one side a surface coating of pyroxylin, rubber, vinyl compound or the like, producing a hard permanent finish which may be of any color and may be glossy or dull, or grained to simulate natural leather or to provide any other ornamental appearance within a wide range of selection.

The coating is carried by only one of the two surfaces of material, designated the surface 3 in the drawing. The back surface of the material, designated 4, is commonly left unfinished or uncoated because it is not exposed or visible in any of the numerous uses to which the product is ultimately put.

This coated material is available in widths equal to the capacity of ordinary looms on which the basic textile material is woven. Since the original material is necessarily square woven, it is necessary to cut it diagonally, at approximate-

3

ly 45°, to produce from it narrow strips of bias weave. It will be evident that, assuming the coated sheet material to be sixty inches in width, a strip cut at 45° from it will be only approximately eighty-five inches long. Splicing such strips end to end, as proposed by the Hill patent and by other prior art methods, requires a separate stitching or other splicing operation to be performed at eighty-five inch intervals. The expense of such operations is considerable, and unless particular care is taken to provide an unusually strong kind of seam or splice, the resulting joints are weak and the product is thus objectionable.

The present invention provides a superior joint and enables it to be made without a special operation at the adjacent ends of each two lengths of cut strip material.

After the material has been folded, with its coated side 3 innermost, and stitched along the line 2 slightly inwardly from its overlapping margins 5, 5, as shown in Fig. 1, the margins 5, 5 are turned back on the body of the material inwardly of the line of stitching 2 and are adhesively secured to the body by an application of rubber cement, pyroxylin, vinyl compound or the like, designated 6; preferably using the same kind of coating composition as was applied to the original material. This results in the intermediate product which is shown in Fig. 2 expanded or opened up to tubular form, substantially circular in cross section.

The cement used in bonding the margins 5 is applied liberally between the margins and the body of the fabric, over the margins and over the adjacent zone of the body, and down in the crevice and into and through the line of stitching 2, all as is attempted to be indicated in Figs. 2 and 6. Inasmuch as the cement is applied to the back surface of the material, i. e., to the uncoated surface of the final product which will not be exposed in use, it is unnecessary to attempt to apply the cement particularly neatly or to take any other precaution in respect of appearance. The cement when it hardens provides considerable structural and tensile strength to the joint, and for this reason it is best to apply it liberally and extensively over and into and through the joint. Preferably the cement is applied in such consistency that some of it will flow through the joint and exude onto the coated front surface 3 of the fabric to provide a body of cement 7 on this front surface, in the crevice of the joint and spreading over onto the abutting margins of the material, as is attempted to be shown in Fig. 6.

The result of these operations is the fabric tube 3 shown in Fig. 2. This tube, after the cement has suitably set, is cut spirally to form a strip 9, as shown in Fig. 3, or a plurality of such strips. The cutting is performed manually or mechanically, as by feeding the tubular body over a mandrel or a supporting roller and rotating a knife edge or a cutting roll in contact with the surface of the body. The cutting line is made at an angle of approximately 45° to the line of stitching 2, or to the axis of the tubular body. That is to say, the spiral cut is of the character of a screwthread having a 45° pitch.

Whether or not a single strip 9, or a plurality of parallel strips 9, be cut from the body depends on the diameter of the body in relation to the width of the strip desired. If, as is generally required, the strip be of the order of one to two inches wide, and the diameter of the tubular

4

body be of the order of twenty inches, a plurality of strips 9 are cut in parallelism because the longitudinal distance between convolutions of the same strip as it is cut from the body is considerably greater than the strip width. In other words, a plurality of parallel strips of such narrow width must be cut simultaneously from a body of such size to make the angle of cut 45°.

The cutting is done continuously on a tubular body of indefinite length and the result is a strip 9 or a plurality of strips 9 having the length of the body and having at equally spaced intervals preformed strong joints crossing the strip diagonally, as shown in Figs. 4 and 5.

These strips are then processed to flatten, smooth and grain the cement which has exuded to the coated surface as shown at 7 in Fig. 6. If necessary, additional cement may be applied to supplement the quantity 7. However, this is generally not required. It is sufficient to heat or warm the cement 7 to soften it and then to pass it under a graining tool or a buffing implement which will flatten it out and merge it into the similarly constituted originally applied coating of the fabric. The result is a practically inconspicuous joint on the coated surface of the strip. This is the final product.

In actual practice the joint is much flatter than is indicated in Fig. 6 and the coating 7 is much thinner and less noticeable. The showing in Fig. 6 has been deliberately distorted to make clear the several components of the joint and their relationship to each other. In actual practice there is no space between the body of the fabric and the turned-over margins 5, and the cement 7 on the coated side 3 does not project above the level of the original coating of the body of the fabric but has its surface in the same plane as that coating.

In Fig. 6 the dotted line 10 is intended to designate the original coating of the fabric where it has not been covered or displaced by or merged with the cement or coating material 7 in the region of the joint. The coatings 7 and 10 are shown differently to distinguish them in the figure. Actually they are indistinguishable in plane, appearance and texture because they are the same kind of material and because the newly applied material 7 is rubbed down to the level of the original coating 10 and is grained or otherwise textured in the same manner; and by the same kind of tool or other implement, as was used in finishing and decorating the original coating when the fabric 4 was made.

The strip product thus has the appearance of a single integral uniformly bias woven strip, and it has practically the same tensile strength in the joints as it has in its body between the joints. In actual use to fabricate welts, gimps, bindings, etc., the strip is subjected to no appreciable tensile stresses. However, it is important that the joints be proof against lateral shifting of the segments or lengths of strip which they unite, and this prevention of lateral shifting is excellently attained by the stitching in combination with the hardened cement which fills the stitching and overlies the joint.

I claim:

1. A strip of coated fabric of indefinite length and relatively narrow width having a bias-woven textile base comprising a plurality of sections arranged end to end and connected by joints each extending oblique angularly across the strip and comprising the two end margins of the two adjacent sections each reversely folded over onto

5

and adhesively secured to the body of the section of which it is a part, with a line of stitching connecting the strips at the fold line where each margin merges with the body of its section, and with a single continuous coating of adhesive covering the line of stitching and the adjacent margins and the adjacent zones of the sections.

2. A strip of coated fabric of indefinite length and relatively narrow width having a bias woven textile base comprising a plurality of sections arranged end to end and connected by joints each extending oblique angularly across the strip and comprising the two end margins of the two adjacent sections each reversely folded over onto and adhesively secured to the body of the section of which it is a part, with a line of stitching connecting the strips at the fold line where each margin merges with the body of the section, with a single continuous coating of adhesive covering the line of stitching and the adjacent margins and the adjacent zones of the sections, and with coating material like that of the coated fabric filling and concealing the crevice formed by the joint in the opposite surface of the fabric.

3. A strip of fabric of indefinite length and relatively narrow width having a bias woven textile base coated on one surface comprising a plurality of sections arranged end to end and connected by joints each extending oblique angularly across the strip and comprising the two end margins of the two adjacent sections each reversely folded over onto and having its uncoated surface adhesively secured to the uncoated surface of the body of the section of which it is a part, with a line of stitching connecting the strips at the fold line where each margin merges

6

with the body of the section, and with a single continuous coating of adhesive covering the line of stitching and the adjacent margins and the adjacent zones of the sections.

4. A strip of fabric of indefinite length and relatively narrow width having a bias woven textile base coated on one surface comprising a plurality of sections arranged end to end connected by joints each extending oblique angularly across the strip and comprising the two end margins of the two adjacent sections each reversely folded over onto and having its uncoated surface adhesively secured to the uncoated surface of the body of the section of which it is a part, with a line of stitching connecting the strips at the fold line where each margin merges with the body of the section, with a single continuous coating of adhesive covering the line of stitching and the adjacent margins and the adjacent zones of the sections, and with coating material like that of the coated fabric filling and concealing the crevice formed by the joint in the coated surface of the fabric.

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