A fabric patching method suitable for two-wire machines

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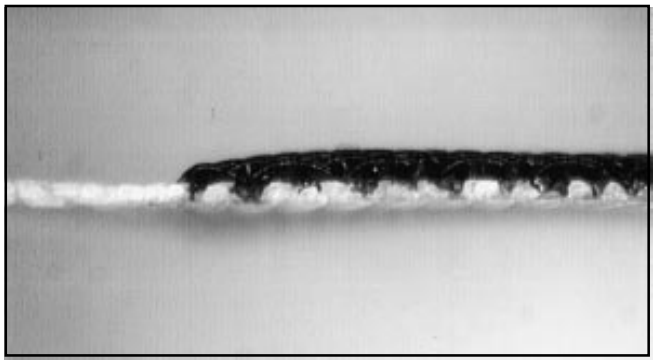
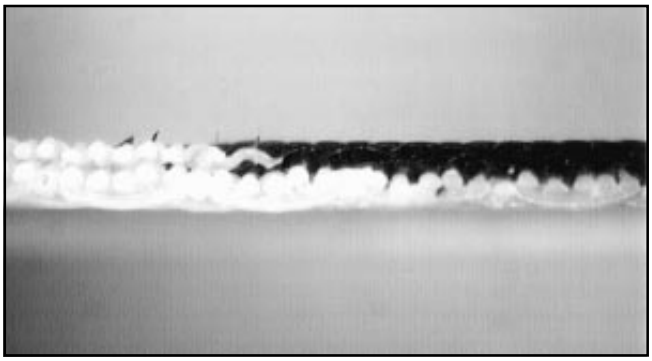
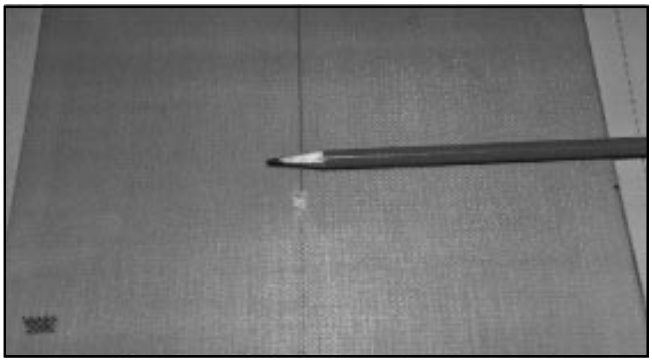
1. A patch on single- or double-layer fabric affixes on top of the papermaking surface, creating an out-of-plane patch.



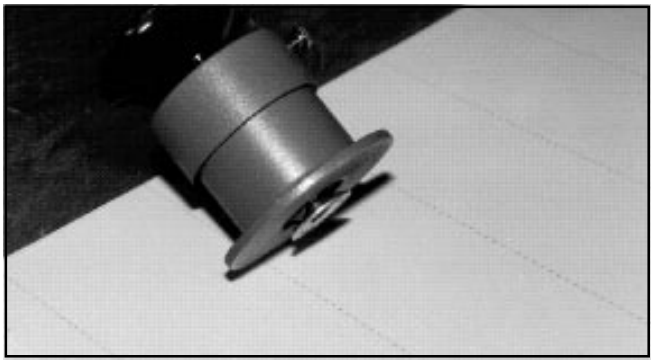
2. A patch on a triple-layer fabric gets embedded into the papermaking surface, creating an in-plane patch.



3. A typical hole is about the size of a pencil. The hole can be about as large as a nickel.



4. A sample cutter specific for that style triple-layer is used to scribe the top layer.



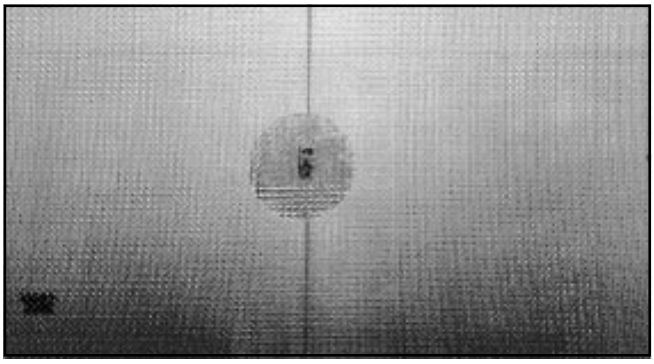
Traditionally, it has not been practical to attempt to patch forming fabrics on two-wire machines. Due to this predicament, paper machines with two-wire configurations have occasionally struggled with removing fabrics prematurely due to holes. If the two-wire machine had a suitable method to patch a hole, and thereby continue production until the next scheduled outage, then clothing life and paper production would likely be much more predictable. The method described in this article is the first suitable fabric patching method for many two-wire machines. It is important to note that only triple-layer fabric design can be patched in this manner.

Why does the method work?

The reason that patches have generally not worked on two-wire machines was because the fabric patch was affixed on top of the fabric surface, creating a patch that was out-of-plane with the body of the fabric. This out-of-plane patch was then scuffed-off by the opposing fabric. If a patch could stay in the plane of the body of the fabric, then it would likely stay on the fabric, even on a two-wire machine. The method described in this article describes how to affix a patch in-plane with the fabric body. As mentioned previously, only triple-layers can be patched in this manner.

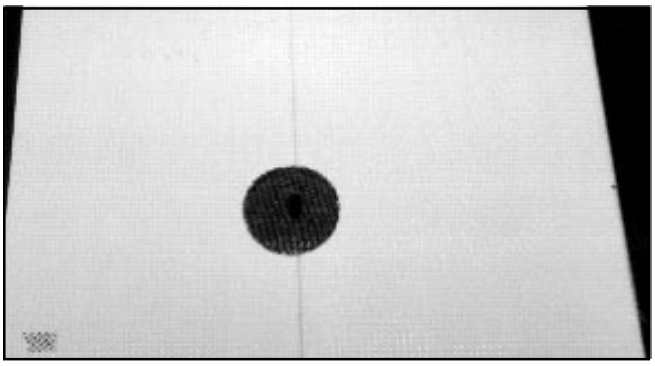
5. The cutter is placed over the hole and the top layer of the fabric and is scribed by pressing down firmly on the sample cutter and rotating 360°.

6. The top layer of the fabric is removed by cutting through the binder yarns that tie the two layers together with a sharp hobby knife.



7. Ultrasonic welding of the patch works best for this procedure.

8. The patch, also cut with the sample cutter, is inset in the repair area and welded to the bottom layer.



Generally, the operation performed involves removing a portion of the paper surface where the hole is located and insetting a patch in this area. The patch is then ultrasonically welded to the bottom layer of the fabric. This method results in an in-plane fabric patch. The following paragraphs show the advantage of this type of patch relative to a single-layer or double-layer.

How is the patch affixed?

As previously mentioned, the patch is embedded into the top layer of the triple-layer fabric by scribing the top layer and then cutting it away from the bottom layer. The procedure used is to scribe the top layer of a fabric with a sample cutter that has been modified to a cut depth that only scribes the top layer of the fabric. After this, the binder yarns of the fabric are cut away from the scribed area, leaving an unpatched bottom layer. A patch is also cut with the sample cutter to ensure an accurate fit into the repair area. The patch is then ultrasonically welded to the bottom layer. The photos give a clearer impression of this procedure.

With the use of this method, paper mills now have suitable means of patching forming fabrics that run on two-wire paper machines. This is due to the fact that the affixed patch stays in-plane with the body of the cloth. Should you require further assistance to this technique, contact your fabric supplier representative. TP

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