

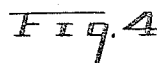
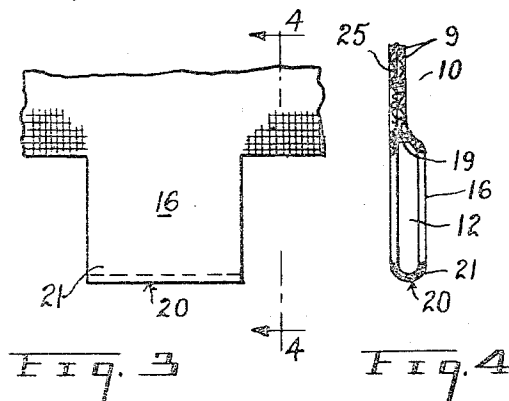
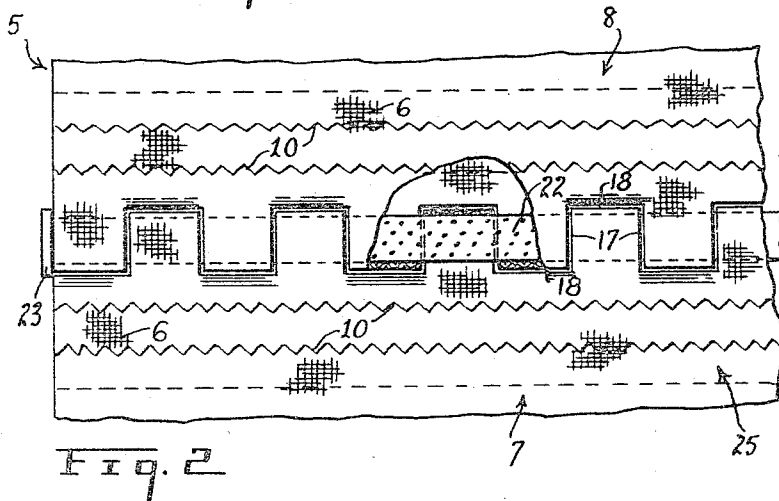
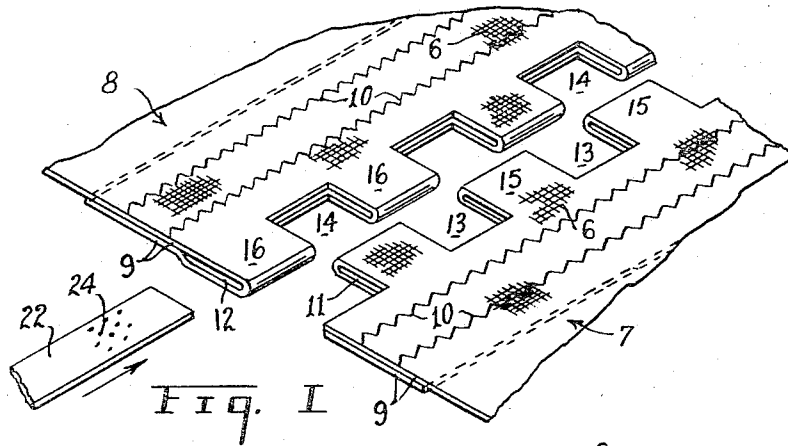
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LIGHT-WEIGHT DRYER FELT SEAMS

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LIGHT-WEIGHT DRYER FELT SEAMS

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4 Claims. (Cl. 34—243)

This invention relates to light-weight dryer felts for paper machines and particularly to the method of joining the ends of a relatively thin open-weave fabric.

In the conventional paper machine the web of paper is dried by passing the web around a series of steam heated dryer drums. A "dryer-felt" is used in conjunction with these drums to ensure intimate contact. The conventional felt is a dense impermeable fabric about 1/8 inch thick, and is joined on the paper machine by means of some form of seam to make it into an endless belt. One method of joining the ends has been a "clipper seam" consisting of a series of steel hooked loops which are clenched into the fabric. The opposing loops at the joint are brought together and the seam completed by the insertion of a pin. Because of the likelihood of sheet marking, the clipper seam is normally covered with a flap.

Recently a new concept in dryer fabrics has been introduced involving the use of an open-weave, relatively thin fabric which will permit evaporating water vapour to escape more readily.

In our co-pending Canadian patent application No. 891,523 filed December 17, 1963, I describe one method of forming the joint in an open-weave dryer fabric involving weaving a loop in the ends of the fabric through which a pin can be passed to complete the joint.

In the present application the opposite ends of the open-weave fabric are folded over on themselves and stitched down to form looped ends. The opposing looped ends of the fabric are then notched in staggered relation to each other to permit the projections in either end to fit into the notches in the opposite ends. A thin flat pin is then passed through the interleaved looped projections to secure the opposite ends of the fabric together. The thin flat pin ensures that the interleaved loop projections will be retained in the same horizontal plane and the longitudinal length of the projections and the width of the flat pin are such that the finished joint will readily accommodate itself to the curvature of the dryer drum over which it passes without imparting a ridge or other marking to the dryer paper web.

The object of the invention is to provide a joint for light-weight dryer felt fabrics which will not materially increase the joint thickness over that of the fabric.

A further object of the invention is to provide a staggered interleaved joint of flat loop construction with a flat pin to hold the interleaved portions in a common plane.

These and other objects of the invention will be apparent from the following detailed specification and the accompanying drawings, in which:

FIG. 1 is a partial perspective view of the opposing ends of the dryer fabric before being joined together and also showing the flat pin before insertion in the joint.

FIG. 2 is a partial plan view of the jointed fabric partly broken away to show the pin passing through the looped projections.

FIG. 3 is an enlarged plan view of a notched portion of one end of the dryer fabric.

FIG. 4 is a longitudinal section taken on the line 4—4 of FIG. 3 showing the method of binding the exposed transverse edges of the notches.

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Referring to the drawings, the dryer fabric 5 is formed of a thin open-weave of warp and weft strands as indicated at 6, in contrast to the thick dense felt normally used in the manufacture of dryer felts for paper machines.

The warp and weft strands 6 may be made of metal or of a plastic material, or of a combination of metal and plastic strands, for instance the warp strands may be of a plastic material and the weft strands may be of metal.

The opposing ends 7 and 8 of the woven fabric are folded over on themselves as at 9 in FIG. 1, and the folded over portions 9 are stitched together by the stitching 10 to form transverse looped ends as at 11 and 12.

Each folded over end is then notched with a series of notches 13 and 14 to form spaced apart projections 15 and 16, each of which forms a section of the loops 11 and 12. The notches 13 in one end of the fabric 5 are staggered in relation to the notches 14 in the opposite end of the fabric in order to bring the projections 15 in one end of the fabric into alignment with the notches 14 in the opposite end of the fabric when the two ends of the fabric are brought into opposing relationship to each other as shown in FIG. 1. Similarly the projections 16 in one end of the fabric will be aligned with the notches 13 in the opposing end of the fabric. The transverse width of the notches 13 and 14 is such that the opposing projections 15 and 16 will fit into the notches with a minimum of clearance space 17 when the two opposing ends of the fabric are interleaved with each other as shown in FIG. 2. Similarly, the longitudinal depth of the notches 13 and 14, and the projections 15 and 16 is such that there will be a minimum of clearance space 18, when the two opposing ends of the fabric are interleaved.

The exposed transverse edges 19 of the notches 13 and 14 are heat sealed and the outer ends 20 of the loops 11 and 12 are coated with a suitable plastic 21. This plastic coating 21 will fill the interstices between the warp and weft strands and thereby strengthen the fabric at these points as well as ensuring that the layers of folded over fabric at these points will not separate. In addition, the coating of plastic 21 will tend to fix the length of the loops 11 and 12 in the longitudinal length of the fabric.

A flat key 22 is inserted through the loops 11 and 12 in the opposing projections 15 and 16, as shown in FIG. 2 to hold the opposing ends of the fabric 5 in the form of a belt. The ends of the flat key 22 can be headed at 23 in order to retain the key in place in the joint.

The flat key 22 is a relatively tight fit in the loops of the projections 15 and 16 when the projections are flattened. The key 22 therefore holds the projections 15 and 16 in a common flat plane when the joint is assembled.

The key 22 can be perforated as at 24 in order to maintain the porosity of the finish belt throughout the area of the joint.

The longitudinal length of the projections 15 and 16 and the width of the key 22 are such that the assembled joint will have no ridging effect when the finished belt is passing around the relatively large diameter of the dryer rolls of the paper machine, and therefore the joint will have little or no marking effect on the formed paper web.

The folded over end portions 9, being folded over on the same side of the fabric ensures that the outer surface 25 of the finished belt will have a smooth continuous surface on which the formed paper web will be carried while passing through the dryer section of the paper machine.

The key 22 can readily be inserted or withdrawn from the joint when the belt is being fitted to or being removed from the dryer rolls of the paper machine, thereby keeping the changeover time down to a minimum.

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What I claim is:

1. A lightweight endless belt for use in the dryer sections of a paper machine, the said belt formed from a length of fabric having an open weave of warp and weft strands, the said length of fabric having its ends joined together to form the endless belt, the joint of the belt comprising folded over end portions of the fabric stitched to form loops extending transversely of the fabric, the said looped portions of the fabric having notched out portions forming a series of transversely spaced apart looped projections, the projections in one end of the fabric being staggered in relation to the projections of the opposite end of the fabric with the projections in one end of the fabric interleaving with the notched out portions in the opposite end of the fabric when the ends of the fabric are brought together to form the endless belt, and a key fitted through the interleaved looped projections to secure the joint of the belt, the said key having a series of perforations throughout its length to maintain the porosity of the belt throughout the area of the joint.

2. A lightweight endless belt as set forth in claim 1,

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in which the said key flat is a flat strip having its ends headed to secure the key in the joint.

3. A lightweight endless belt as set forth in claim 1, in which the exposed edges of the folded over fabric between the looped projections are heat sealed.

4. A lightweight endless belt as set forth in claim 1, in which the folded over fabric adjacent the base of the notches and projections is coated with a plastic material, the said plastic material penetrating the interstices of the woven fabric to bond the folded over end portions.

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