Feb. 17, 1959 J. R. L. SANTOS 2,873,494

DRYER FELT CONNECTION

Filed June 24, 1954

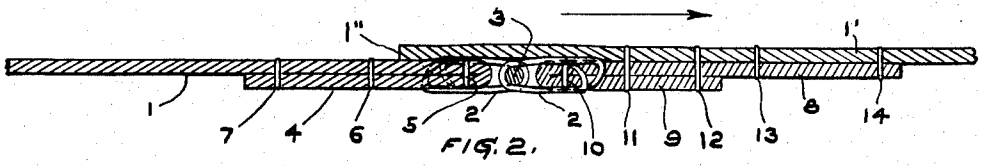

FIG. 2.

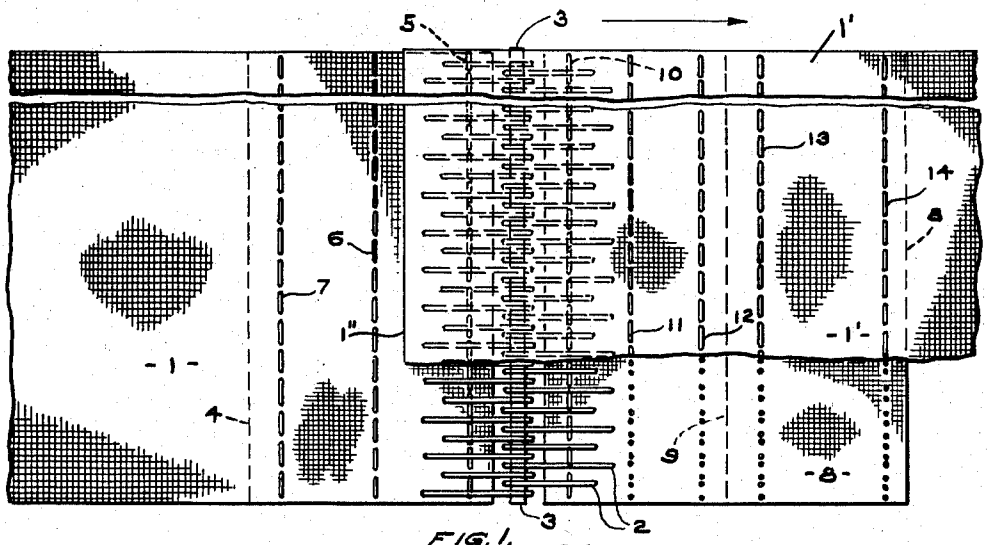

FIG. 1.

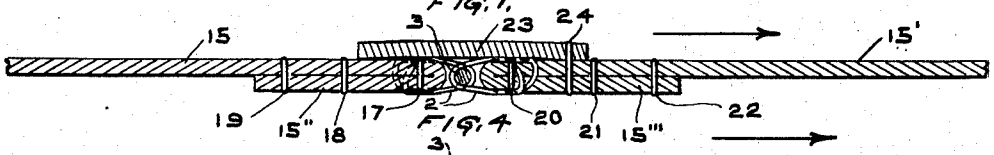

FIG. 4.

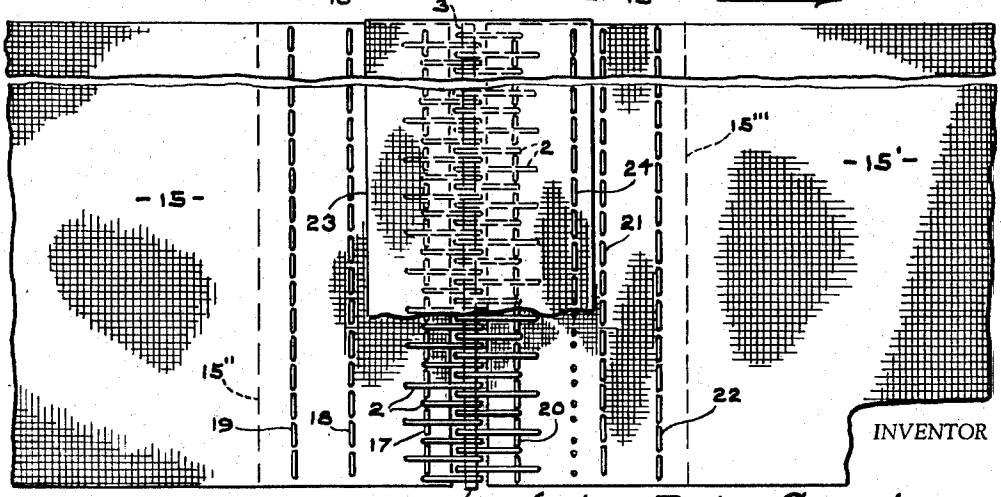

FIG. 3.

INVENTOR

John R. L. Santos

BY Thomas W. J. Clark

ATTORNEY

United States Patent Office 2,873,494 Patented Feb. 17, 1959

2,873,494

DRYER FELT CONNECTION

John R. L. Santos, Baltimore, Md., assignor to William E. Hooper and Sons Company, Woodberry, Baltimore, Md.

Application June 24, 1954, Serial No. 439,081

5 Claims. (Cl. 24—33)

The present invention relates to an improved seam for paper drier felts including a particular structure for covering the connecting elements of the seam.

These drier felts are usually manufactured in sheets of very considerable widths and lengths. Due to their width and length they at times have transverse waves and at times the seam runs at other than a right angle to the direction of travel. The seaming between the ends must be rugged. The sheet is then made into an endless belt by connecting its ends. The most satisfactory manner of connecting these ends at the present time is by means of elongated looped wire staples or clips, which are clipped to the respective free edges of the sheet or belt by a machine after which a suitable pintle is extended through the overlapped wire loops. While this type of connector is quite satisfactory, it is most desirable to cover the joint to protect the paper or other material being handled against impressions and possible stain from the metal staples or clips, also it is most important that these seams, or connections, have as little uneveness as possible to insure smooth running and uniform operation from both sides, since they sometimes go over rollers, bending first one way and then the other. Therefore, the primary object of the present invention is to provide a seam construction for a drier felt in which the metal belt connecting members are covered with a drier felt similar material and at the same time have a minimum of thickness at the joint.

Another object of the invention is to provide a new and novel method of covering the metal joining clips.

Another object of the invention is to securely attach the seam cover and to maintain the strength of the seam at its maximum.

A further object of the invention is to provide a drier felt that will be economical to manufacture and practical and effective in its operation.

The use of these drier felts is well known to those skilled in the art, but as the present invention relates exclusively to the seam or joint, of the drier felt itself, its use and manner of operation is referred to in only a general way.

With the above and other objects in view, the invention is illustrated in the accompanying sheet of drawing and described in the detailed description that follows together with the manner in which the improved seam is constructed including its uses and advantages.

In the drawings:

Figure 1 is a plan view of one of the forms of the invention.

Figure 2 is a sectional view taken through the seam of Figure 1.

Figure 3 is a plan view of a modified form of seam.

Figure 4 is a sectional view taken through the seam of Figure 3.

In referring to the drawings like character references are used to designate like and similar parts throughout the several views.

In the making of paper the wet paper fibers are collected into a coherent sheet form upon the drying felt. These drying felts are sometimes of great length and width, therefore, it is necessary to make the connection between the belt ends as strong as possible and at the same time keep the seam reasonably flat.

As illustrated in Figures 1 and 2 the ends 1 and 1' of the belt are held together by a plurality of elongated looped wire staples 2. The ends of the staples are bent at right angles to the elongated portions of the staple and are arranged along each edge of the belt. The loops of these staples or clips in the respective ends of the belt extend past each other a sufficient distance to allow a relatively thin pintle 3 to be extended through the respective loops as shown in both Figures 1 and 2. In each belt end, long and short staples alternate. In order to form the joint, the end portion 4 of the end 1 is turned under and extends along the under side of the belt. This folded back portion 4 is then sewed transversely of the belt with three strong rows of thread 5, 6 and 7. Row 5 is located adjacent the edge of the belt, beneath the staples, row 7 is located adjacent the end of the underturned portion 4 and row 6 is located substantially midway between rows 5 and 7. The opposite end 1' of the belt is not directly engaged by the metal staples. A separate piece preferably of the same or similar material is folded upon itself as shown at 8 and 9. The material is so folded that one of its sides 8 is longer than the other 9. This folded piece extends the entire width of the belt and is provided with a row of stitches 10 adjacent its front edge. This piece is stitched to the end 1' of the belt by four rows of stitches 11, 12, 13 and 14. Rows of stitching 11 and 12 pass through both layers 8 and 9 of the folded piece and the belt itself. Rows of stitches 13 and 14 pass through only the single layer 8 of the separate piece of the belt. The separate piece is placed inwardly from the end 1'' of the belt end 1' for a distance sufficient to allow the edge 1'' of the end 1' to overlap the metal connectors to form a smooth and continuous surface or flap upon which the paper is supported over the connectors.

It will be noted that the angular ends of the staples engage the folded ends of the material beyond the rows 5 and 10 of the stitching. These stitches prevent excess swelling of the material in the area where it is folded, therefore preventing the swelling of the material from loosening the staples, which might impair their holding effect.

The modified form of drier felt shown in Figures 3 and 4 is in general quite similar to the form shown in Figures 1 and 2, which is the preferred form, because the staples or clips are attached directly to one end of the belt. The staple holding is preferred over the stitch holding, for strength.

In Figures 3 and 4 the ends of a drier felt 15 and 15' are illustrated. The end 15 of the drier felt is folded downwardly and under the end of the felt as shown at 15''. This folded end portion is sewed down upon the end 15 of the belt by three rows of stitches 17, 18 and 19 similar to that shown and described in Figures 1 and 2, the line of stitches 17 being just inwardly from the folded edge. The end 15' of the felt is formed in exactly the same way, as shown at 15''', being sewed down upon the portion 15' by the stitches 20, 21 and 22, the line of stitches 20 being just inwardly from the folded edge. Extending over the joint in the present modification is a short separate member 23, preferably made from drier felt material. This strip or flap is secured to one end of the belt by a row of stitches 24, which retains the member 23 over the seam. The looped wire staples, or clip members 2 are of such length and width as to allow their angular ends to engage the folded ends of the material just beyond the rows of

stitching adjacent the respective folded edges and at the same time they are of sufficient length as to extend beyond the edge to assume an interdigitating relationship with staples from the opposite edges of the belt after which a pintle **3** is extended through the looped ends of the staples to hold the two ends of the belt together.

With the present construction, the folded edges of the material are held to a minimum of swelling by the row of stitches such as indicated at **5**, **10**, **17** and **20**, as these belts do swell, since most of the time they run very wet.

It will also be noted that with the present construction, the joining staples do not come in contact with the paper carried on the working surface of the belt and therefore can not be injured thereby, the joint being always covered with either the extended end of the felt or a flat separate piece sewed to the upper surface of the felt.

The paper layer is uniform over the hinge in both modifications, and has only one step at 1" in Figures 1 and 2, and two steps in the construction of Figures 2 and 3. These steps tend to merge with the lower felt in use. It is preferred that the strip **23** be slightly thinner than the body of the felt, it is subjected to less strain and such thinner material makes a shorter step at the ends of the strip.

The joint also provides for a minimum and gradual rise in the belt as it moves across or around the supporting drying rolls.

For example, in Figures 1 and 2, when the belt is moving in the direction of the arrow, the roll over which the belt passes contacts just the outer edge of the folded piece **8** and after this edge has moved onto or off the roll, the shorter edge **9** moves on or off the roll. By this step arrangement the bump at the seam is minimized. In the structure shown in Figures 3 and 4, there is only one step, which is the outer edge of the folded back edge, the cover strip **23** being sewed to the top of the belt by the row of stitches **24**, which is located inwardly from the row of stitches adjacent the folded edge of the felt.

While the seam structure has been described in detail, it is not intended as a limitation, as the scope of the invention is best defined in the appended claims.

What is claimed as new and is desired to be secured by Letters Patent is:

1. A drier felt end fastening construction comprising an elongated fabric belt of single thickness and a single added fabric member, the belt and member forming together belt joining ends of triple thickness, each end having a portion folded back upon itself to constitute two of the three fabric thicknesses and a row of looped clips attached to each end portion folded upon itself, each end portion folded upon itself having a row of stitches along and adjacent the fold and within the looped clips and a pintle connecting the clips of the respective end portions together, the third fabric thickness extending over said clips to cover the same, stitches passing through the triple thickness of fabric on the leading side of the fastening construction with respect to the direction of belt travel, to securely hold the three thicknesses of fabric all together, the looped clips on at least one end of the belt passing through a back fold of the fabric belt itself, the back folded portions of both the belt and added fabric member being of the same weave pattern as the other portions, whereby the clips and stitching within the clips have the reinforcement of the woven material to effect the hold of the clips on the belt and added member.

2. The construction of claim 1 in which the looped clips on both ends of the belt pass through a back fold of the fabric belt itself and the added member is a single thickness sewed to one end of the belt and extending to overlay the clips without any folds therein.

3. The construction of claim 1 in which the third fabric thickness extending over the clips is the fabric belt itself and the added member is folded double and sewed to the overlapping end of the belt, spaced back from the overlapping end.

4. In a drier felt comprising an elongated fabric belt in the form of a single sheet having reinforced edges at its ends adapted to receive means for forming a connecting seam at the said ends, one of the ends of the belt sheet being folded downwardly and rearwardly along one surface of the sheet, forming a folded edge, a plurality of rows of stitches securing the rearwardly folded end to the other surface of the belt sheet, at least one row of the stitches being adjacent and parallel with the folded sheet edge, the end of the sheet opposite the rearwardly folded end being a free end, a separate short piece of material substantially the same width as the belt folded upon itself having a row of stitches adjacent its folded edge, the said seperate piece being secured to the free end of the sheet on the surface thereof having the rearwardly folded end first named and spaced inwardly from the said free end thereof, the respective folded edges extending toward one another, said seam connecting means being in the form of a plurality of elongated looped staples extending lengthwise of the belt and having their ends turned at substantially right angles to the longitudinal axis of the staple to engage the rearwardly folded edge at one end of the belt and the folded piece attached to the adjacent free end of the belt and a pintle connecting the looped staples on the respective folded edges, said staples being of such length as to engage the folded edges beyond and adjacent the stitches extending along the respective folded edges, the free end of the belt extending beyond the folded edge of the attached piece and beyond the folded edge of the belt covering the surface of the belt over the seam when the ends of the sheet are held in abutted position by the connecting means, the back folded portions of both the belt and separate piece being of the same weave pattern as the other portions, whereby the clips and stitching within the clips have the reinforcement of the woven material to effect the hold of the clips on the belt and separate piece.

5. In a drier felt as claimed in claim 4 in which the folded attached piece is provided with one fold longer than the other, the longer fold being positioned adjacent the drier felt and a plurality of stitches securing both folds of the separate piece to the felt.

References Cited in the file of this patent

UNITED STATES PATENTS

1,748,880	Hill	Feb. 25, 1930
1,932,203	Diamond	Oct. 24, 1933
1,986,490	Wilson	Jan. 1, 1935
1,998,135	Heinz	Apr. 16, 1935
2,084,490	Hooper	June 22, 1937
2,139,544	Fleming	Dec. 6, 1938
2,158,007	Ellis	May 9, 1939
2,629,909	Hall	Mar. 3, 1953