April 4, 1933. G. F. PUTVIN 1,903,406

SEAM FOR DRIER FELTS AND METHOD OF MAKING SAME

Filed Jan. 8, 1931

FIG. 1.

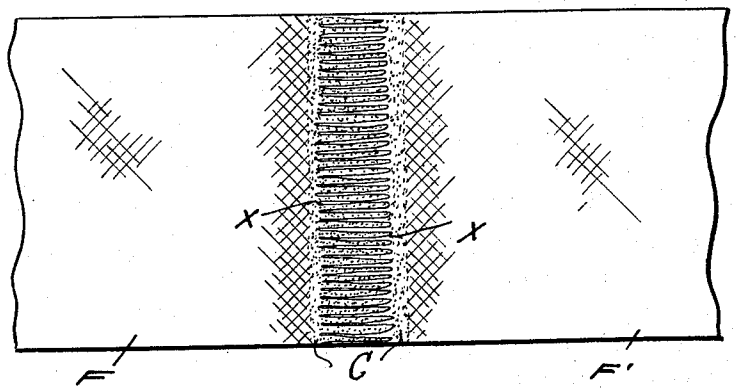


FIG. 2.

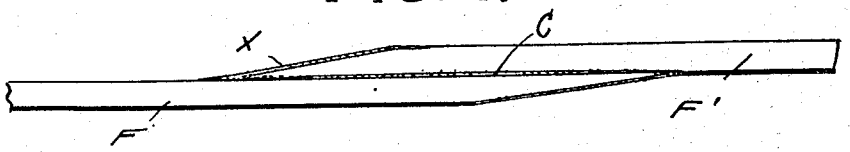


FIG. 3.

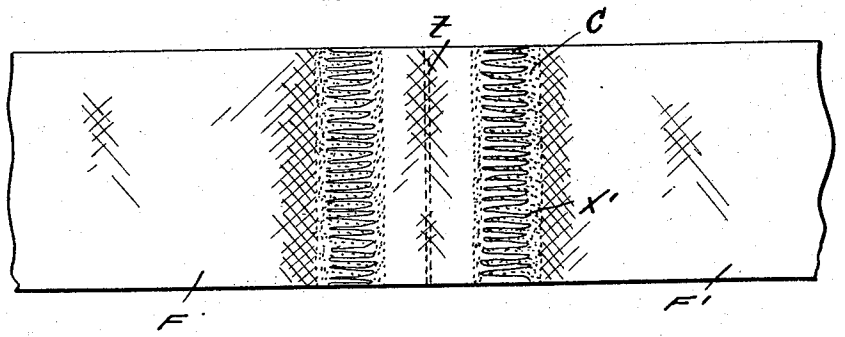


FIG. 4.

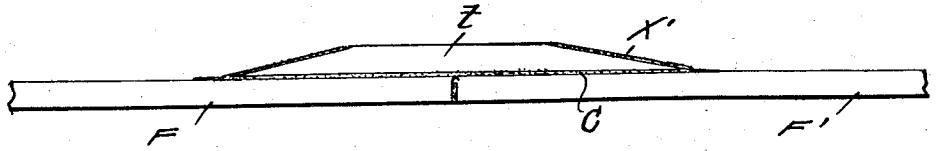
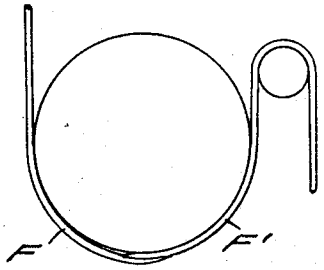


FIG. 5.



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UNITED STATES PATENT OFFICE

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SEAM FOR DRIER FELTS AND METHOD OF MAKING SAME

Application filed January 8, 1931. Serial No. 507,505.

The present invention relates to a new and useful improvement in seams for drier felts used on paper machines and to the method of producing same.

One of the objects of the invention is to produce a seam not affected by the moisture of the paper carried on the felt.

Another purpose is to prepare a seam not disintegrated by the chemicals, such as alkali sulphites, found in the paper carried by the felts.

A still further aim is to prepare a seam capable of withstanding great separating tension.

Another object is to construct the seam so that it will leave no undesirable impressions in the paper as it passes over the felt.

An additional purpose is the provision of a method for preparing the seam so as to accomplish each and all of the above objects.

With the above aims and purposes in view, and such others as will be apparent to those skilled in the art to which this invention appertains, reference is made to the accompanying drawing, in which

Figure 1 is a fragmentary plan view of one form of my invention showing my improved seam,

Figure 2 is an edge view of the seam of Figure 1,

Figure 3 is a fragmentary plan view of a modified form of my invention,

Figure 4 is an edge view of the seam of Figure 3, and

Figure 5 is an edge view showing the device in use.

As is well known, the drying of paper is usually performed on large aprons in paper machines, which aprons are known as felts. These felts are made of a heavy canvas and are arranged as an endless apron in the machine. To prepare such an endless felt, it is necessary to join the ends of a long strip of canvas, usually about 200 inches wide and 800 feet long. This joint or seam has, heretofore, given a great deal of trouble, as it frequently separated during the operation of the machine and left undesirable impressions in the paper. With my invention, however, I have cured the above defects by providing a seam which will not separate nor disintegrate, and will last as long as the felt itself, usually three to four months, depending on the demands made thereon.

Heretofore, the joint or seam has been secured either by sewing or by the use of copperized rivets. When a sewed seam is used, ends of the felt are turned back upon themselves and joined by stitching. This forms flaps at the underside of the felt. Such a seam is very unsatisfactory for a number of reasons. The stitching only lasts a month, or at the most, six weeks. The water and alkali sulphites in the paper quickly disintegrate it. The flaps interfere with the operation of the machine in that they splash some of the paper pulp and cause considerable trouble. The delay incurred in fixing the seam and consequent loss of time in production is very undesirable.

When copperized rivets are used, the ends of the felt are overlapped and secured by copperized rivets. The alkali sulphites present in the paper quickly act upon the copper, destroying the copper plate of the rivet, leaving it bare steel, thus causing marks on the paper; all of which proves very unsatisfactory, and necessitates a cessation of operations while a new seam connection is made.

Figures 1 and 2 show one form of my invention. I have found that by the use of a waterproof cement, a number of which are now on the market, all of the above difficulties can be eliminated. The ends of the felt F and F′ are first placed upon a board and tacked thereto. Then, by any well-known means, the fabric is scratched and roughened to produce a rough surface. Preferably the outer surfaces of the felt will be skived toward the ends to form an inclined surface. This may be done by means of the surface roughening instrument or may be accomplished previously in any preferred manner. In lieu of skiving the ends of the felt to be joined may be partly unravelled so as to provide a substantially smooth surface at the site of the joint when the ends are overlapped. The glue or cement is then applied and the ends F and F′ overlapped to form the seam. The purpose of the roughening is to separate

the fibers of the fabric to permit the glue or cement C to penetrate within the pores of the felt. This operation takes but a short time and the machine with the new felt can be quickly placed in operation again, and the seam will last as long as the felt itself. The glue or cement not only binds the ravelled end strands x together but also binds them upon the adjacent surface. My seam has been used in a number of paper mills and has met with general approval. The value of my seam and its satisfactory performance may be explained as follows:

By overlapping the felt ends F, F′ the glue is maintained between the ends. Any water penetrating through the felts first reaches the cement within the pores of the felt. The contacting surfaces of the felt are not reached by the water, as the cement, being waterproof, does not permit this action. Accordingly, it will be appreciated that a most desirable result is attained—namely, a seam so formed as not to be subject to disintegration by the water and alkali sulphites in the paper. The seam formed according to my invention has been tested by applying a great pulling tension to each end of the felt, such tension aggregating in excess of 3,000 pounds per 1,000 square inches, and the seam did not come apart.

Figures 3 and 4 show an alternative arrangement of my invention. The flap ends, F, F′, are roughened, as above explained, as is a fabric patch t. Cement C is applied to the ends and to the patch t, and then the ends and patch are united, as in Figure 4. The edges of the patch t, like the edges x of Figures 1 and 2, may be ravelled as at x' to leave a smoothened surface, so as to make no marks in the paper. The glue or cement, as before, connects the ravelled edge strands x' to each other and to the adjacent felt surface, and enables a greater quantity of glue to be effectively disposed at the felt ends than would otherwise be possible.

I very well know that it is old to secure the ends of leather belting by glueing the same together, and that it is not new to patch together two members by overlapping the same after cement has been applied thereto. What I consider novel, however, is the seam formed according to my invention for use in joining the ends of felts and for similar conveyor belts where the problems of moisture and chemicals are involved, and for the necessity of a smooth surface at the overlapped end edges with great adhesive requirements thereat. It is these factors which heretofore rendered the sewed or riveted seams decidedly unsatisfactory, and the problem, to the best of my knowledge, was not satisfactorily solved until my invention.

Felts seamed in this way and particularly as in Figures 3 and 4 are admirably suited for paper machines that are making fine grades of paper, such as bond and book paper, in which marks or imperfections are particularly noticeable and objectionable.

While it is true, as I have stated, that various commercial waterproof glues and cements may be used in carrying out my invention, I have found that the best results are obtained by taking a very heavy concentrated glue or cement, and thinning it with acetone, gasoline, alcohol, or some other volatile liquid before applying it to the drier felt. The prime advantage in this step is to better enable the adhesive to penetrate into the pores of the hard thick canvas-like cotton drier felt. Thus, tremendous binding tenacity is obtained when the overlapped adhesive-impregnated joint portions are compressed together to complete the seam.

However, the volatile liquid in the cement or glue has a further very important function in that the application of glue or cement to the felt containing this volatile constituent effects a cleaning of grease or the like from the felt so as to enable the glue or cement to penetrate the same. Obviously, a glue or cement lacking a cleaning function and containing merely animal matter, for instance, could not penetrate greasy areas of the felt. Naturally in use the felt will be apt to, and in fact usually does, acquire grease spots particularly adjacent the edges as a result of contact with grease cups, etc.

From what has been said herein it is believed that the novel features, functions and advantages of the invention will be readily apparent to those skilled in the art, and appreciated as solving a long felt want in the paper mill field especially,—although it is to be understood that the invention in susceptible of other applications. Likewise it hardly need be pointed out that the herein depicted forms of the invention is not to be taken as limitative, except insofar, and to the extent that the interpretation of the terms of the accompanying claims may be governed by the prior art.

I claim:

1. A seam for a fabric felt for paper machines having terminal portions adjacent each other at their edges, means for joining the portions comprising a patch having ravelled ends, and waterproof adhesive interposed between the patch and its ravelled ends and the felt, whereby the seam is rendered resistant to disintegration by moisture.

2. A seam for uniting the adjacent ends of a woven fabric felt including a felt portion for uniting the adjacent ends of the fabric felt, said felt portion having a ravelled terminus, a bond of cementitious material connecting said ends, the cementitious material embedding the loose fibres of the ravelled terminus and connecting the same to a surface of the fabric felt.

3. The method of uniting adjacent ends of

a woven felt for treating paper pulp, which comprises ravelling and overlapping said ends and cementing together the overlapping end portions with a bond of cementitious waterproof material to embed the ravelled end portions in the felt surfaces for rendering the cemented ends impervious to water and chemical solutions drained from the pulp.

4. A seam for a fabric felt for paper machines comprising overlapped terminal portions of said fabric felt, said terminal portions having ravelled ends, a bond of cementing material interposed between and connecting said overlapped terminal portions, said cementing material embedding the loose fibres of said ravelled ends, and connecting same to the juxtaposed felt surface.

5. A seam for a fabric felt for paper machines comprising overlapped terminal portions of said fabric felt, at least one of said terminal portions having a ravelled end, a bond of cementing material interposed between and connecting said overlapped terminal portions, said cementing material embedding the loose fibres of said ravelled end and connecting same to the juxtaposed felt surface.

In testimony whereof I affix my signature.

GEORGE F. PUTVIN.