Dec. 1, 1931. T. HINDLE 1,834,343

PAPER MAKER'S DRIER FELT

Filed Aug. 24, 1929

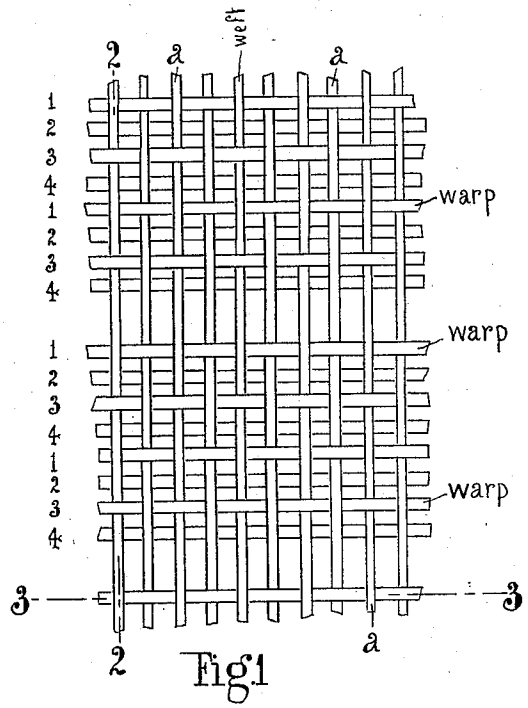


Fig.1

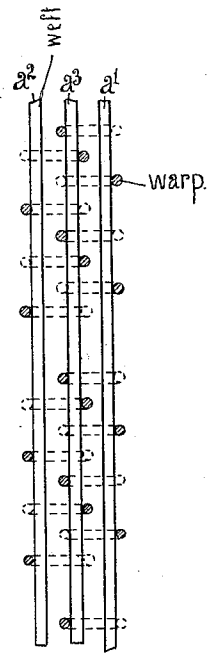


Fig.2.

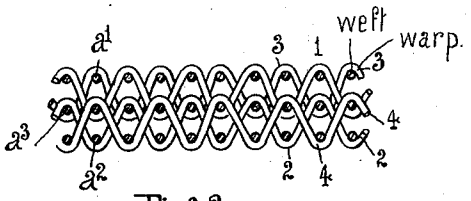


Fig.3.

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UNITED STATES PATENT OFFICE

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PAPER MAKER'S DRIER FELT

Application filed August 24, 1929, Serial No. 388,247, and in Great Britain November 23, 1928.

This invention relates to the woven drier-felt, as used on the drying cylinders of paper-making machines, and is designed to provide a drier-felt which will give more efficient and better drying of the paper and longer life in service.

The function of a drier-felt on a paper machine is to cause the moist web of paper to contact uniformly and successively against the steam-heated cylinders, and permit the steam generated to escape through it. The moisture and vapour driven off the paper web in the process of drying may contain corrosive chemicals, which permeating uniformly the entire structure of a drier felt cause rapid erosion and disintegration of the whole of the yarns composing the felt, and the object of the invention is to provide divisions or sections at intervals across the cloth more open or porous which will provide more ready passage or escape for the steam or vapour leaving the other parts more dense and less liable to penetration.

Paper makers' drier felts have been woven as a dense compact fabric composed of two sets or pairs of warps interlocked or interwoven together each set of two warps being locked alternately as an intermediate layer by an intermediate filling weft as described in specification No. 173,617 dated February 15, 1876.

Such fabric is of equal density throughout its width and the invention consists in constructing such a multiply fabric for drying felts with a dense intermediate layer in which the warps are crowded laterally into compact dense groups divided by spaces devoid of warp thereby forming a multiply fabric with longitudinal sections of compact dense formation alternating with longitudinal sections devoid of warps and of open or porous formation.

The invention will be fully described with reference to the accompanying drawings:—

Fig. 1 is a plan view of a felt woven according to the invention.

Fig. 2 is a transverse section on line 2—2 Fig. 1.

Fig. 3 is a longitudinal section on line 3—3 Fig. 1.

The felt is made with two sets or two pairs of warps and three sets of weft *a* to produce a three layer felt. The two sets of warps are woven with independent wefts *a*1, *a*2 to produce the outer or face layers of the felt and interwoven with a third weft *a*3 to produce an intermediate layer uniting the two outer or face layers in known manner as described in the specification of Patent No. 173,617 dated February 15, 1876.

The grouping and spacing of the warp yarns 1, 2, 3, 4 is effected by suitable distribution of the yarns in the reed of the loom. For example in a reed having 10 dents and spaces per inch for a uniform felt having say 60 warp ends per inch the warp ends are evenly distributed with 6 ends in each space of the reed while for the improved felt with dense and open divisions every third space in the reed is left unoccupied and all the 18 ends are crowded into the two adjacent spaces each containing 9 ends, or in a reed having say 80 warp ends per inch the warp ends are evenly distributed with 8 ends in each space of the reed while for the improved felt with dense and open divisions every third space in the reed is left unoccupied and all the 24 ends are crowded into the two adjacent spaces each containing 12 ends.

In the drawings the location of the warps shows a weave based on 2 pairs of warp ends, although any multiple of 4 threads may be crowded into a group according to the distance desired between the spaces.

Thus alternate divisions or sections in the felt are produced of dense or closely woven material and porous or loosely woven material formed by spaces only crossed by the weft yarn.

The moisture and vapour pass through the porous divisions in the felt, rather than through the relatively dense divisions formed by the grouped warp, which consequently are not permeated by the corrosive chemicals and the warp yarns comprising the dense groups (more particularly the internal yarns) are protected against rapid chemical deterioration, and thus retain their mechanical strength for longer periods.

In use, the warp yarns of the felt are sub-

ject to far greater mechanical stress than are the weft yarns. The weft yarns are not protected at the points corresponding to the porous divisions in the warp, but as stated, the protection of the warp yarns, or of a large proportion of the same, is of considerably greater importance.

The porosity of the drier-felt constructed as described is improved, since the moisture and vapour can pass more freely through the felt by way of a smaller number of larger interstices, than by way of a larger number of smaller interstices of equivalent total area.

What I claim as my invention and desire to protect by Letters Patent is:—

Paper makers' drier felts of multiply layers composed of two pairs of warps interlocked and interwoven together each pair being locked together by an intermediate filing weft (in a known form of weave) in which the warps are crowded laterally into dense and compact groups each group being divided from the next by a space devoid of warps and forming a multiply fabric with longitudinal sections of compact dense formation alternating with longitudinal sections devoid of warps and of open porous formation.

In testimony whereof I have hereunto set my hand.

THOMAS HINDLE.