

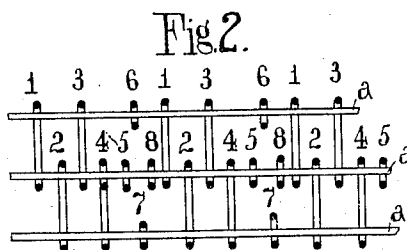
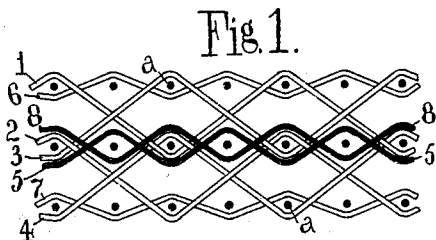
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DRIER FELT FOR USE IN PAPER MAKING MACHINES

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DRIER FELT FOR USE IN PAPER-MAKING MACHINES

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The invention relates to the woven drier felts as used on the drying cylinders of paper making machines.

The drier felts used on a paper machine serve to press the wet paper web evenly to the peripheries of steam heated drying cylinders. The drier felt absorbs moisture from the paper web while the two are in contact, the absorbed moisture being evaporated or dissipated from the drier felt while the latter is passing from cylinder to cylinder, when the working face of the drier felt is exposed to the heated air surrounding the paper machine.

It is thus desirable that a drier felt should be as porous as possible to enable it to absorb the moisture, but if the drier felt is constructed solely with the object of providing such porosity, it will stretch very considerably, and the shrinkage in width will also be excessive and objectionable.

The object of the invention is to provide a drier felt which possesses a very high degree of porosity on the surface to enable the moisture to be absorbed easily, but for which, by reason of the novel construction adopted, the longitudinal stretch and transverse shrinkage are both very small indeed.

According to the invention the drier felt is so constructed to have an open or cellular porous layer on each surface, with dense intermediate layer into which additional warp threads are crowded interwoven and interlocked with one layer of weft threads thereby providing a high density factor which limits the possible shrinking in the width.

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

Figs. 1 and 2 show diagrammatically a longitudinal section through the weft threads *a* and a transverse section through the warp threads of drier felt embodying the invention.

Into the intermediate layer of the felt additional warp yarns numbered 5 and 8 are crowded at intervals around the weft thread. The purpose is two-fold, firstly to increase the strength, density and firmness of the felt by providing additional warp, this additional warp being disposed in the

intermediate layer of the felt, where it is protected from rapid erosion and wear, to which the yarns on the surface are exposed, and secondly, to create so great a crowding of the warp yarns in the intermediate layer of the felt as to resist and counteract the tendency to shrink in width when wetted.

Due to the interweaving and interlocking of the crowding warp 5 and 8 weaving plain about the intermediate layer of weft *a*, the resultant felt is firmer and stretch is very greatly reduced.

Another advantage of the dense crowded intermediate layer is that the warp and weft yarns on the surfaces of the cloth are openly spaced and consequently both surfaces are porous due to the cellular construction.

Another advantage of this construction is that a felt is evolved having three distinct layers of warp threads 1 and 6, 2, 3, 5 and 8 and 4 and 7 with only three layers of weft *a*. In consequence this drier felt is cheaper to produce than other known types of felt having three distinct layers of warp, as such required four layers of weft.

It will be apparent to those skilled in the art of weaving that the felt shown with the crowded warp yarns 5 and 8 must be woven on eight shafts since the pattern repeats on eight warp ends.

The crowded warp ends are arranged to weave plain about the central layer of weft, and are crowded in among the other warp ends in the manner shown to secure the greatest possible crowding effect. They are of the same material as the other warps.

The surface layers, by reason of the open spacing of the warp threads 1—6 and 4—7 have a cellular formation which readily absorbs the moisture from the paper while in contact therewith, and which, moreover, facilitates the dissipation or evaporation of the moisture when the working face of the drier felt is exposed to the heated air surrounding the machine.

The dense intermediate layer provides the necessary longitudinal strength for the drier felt, and subject to the weaving being done with the warp yarns under appropriate ten-

sion, this improved drier felt has very little stretch.

The dense intermediate layer, which provides longitudinal strength, is protected from rapid burning by the surface layer presented to the paper and heated cylinders. The repeated bending in reverse directions around the cylinders and rollers tends to subject the surface layers of a multiple layer drier felt to extra stresses, but does not greatly affect the intermediate layer. In the improved construction, due to the higher density of the intermediate layer, the warp threads comprising that layer are slightly tighter than the openly spaced threads comprising the surface layers, and as a result, the warp threads of the surface layers, which are liable to lose their strength owing to physical and chemical effects, are not unduly strained by reverse bending, and the drier felt, constructed in the manner described, consequently can be used for longer periods on the paper machine.

I claim:

1. A multiple layer felt for paper making machines comprising the combination of a dense intermediate layer of closely crowded interwoven and interlocked warp threads all of similar textile fibres and having a much greater number of ends per inch than the face layers and outer surface layers of loose cellular porous structure, having considerably fewer ends per inch than the intermediate layer.
2. A multiple layer felt for paper making machines constructed with a dense intermediate layer of warp threads of textile fibres containing about double the number of ends contained in the face layers, of the same material, laterally crowded together and open cellular porous surface layers, containing about half the number of ends contained in the intermediate layers.

In testimony whereof I have hereunto set my hand.

THOMAS HINDLE.

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