Aug. 14, 1962 I. W. JONES 3,049,153

DRYER FELTS

Filed Oct. 12, 1959

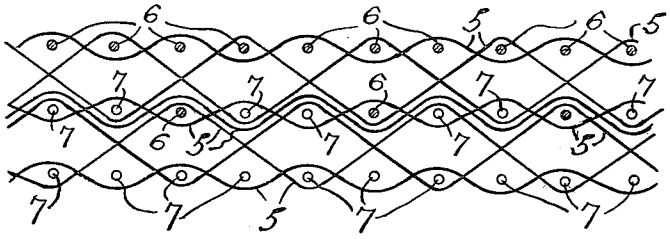


Fig. 1

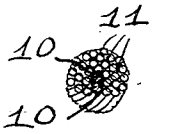


Fig. 3

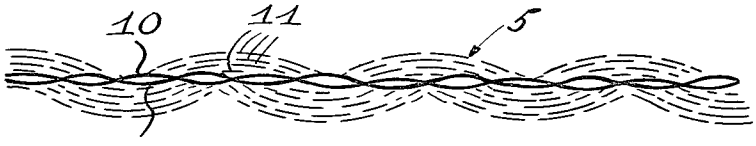


Fig. 2

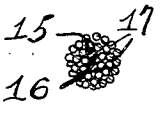


Fig. 5



Fig. 4



Fig. 6

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United States Patent Office 3,049,153 Patented Aug. 14, 1962

3,049,153
DRYER FELTS

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Filed Oct. 12, 1959, Ser. No. 845,876
Claims priority, application Canada Sept. 15, 1959
3 Claims. (Cl. 139—426)

This invention relates to improvements in dryer felts for pulp and paper machines.

A particular object of this invention is to provide an improved felt composed of at least a substantial percentage of a polyethylene terephthalic yarn, which is known in the trade as "Terylene" in which the weft yarns are pretreated to stabilize the woven fabric against lateral shrinkage.

A further object is to provide a felt of the character described in which the warp yarns are formed of a composite synthetic and natural yarns which permit of controlled stretch and shrinkage in the warpwise direction of the woven fabric.

Heretofore, dryer felts of Terylene composition have had considerable success as to strength and wear resistance. However, the main disadvantage in the use of Terylene is that it is subject to progressive shrinkage under certain conditions of temperature and humidity. On the paper machine there is nothing to restrain or exert a stretching pull in the weftwise or cross direction so that normal Terylene reinforced weft yarns are subjected to progressive shrinkage, and this is further induced by the normal stretch or pull in the wrap or lengthwise direction of the felt.

The primary tendency to shrink of the reinforced weft yarns can be offset by heat relaxing the filament yarns at definite elevated temperatures before being incorporated with the asbestos roving mix into the final weft yarn.

Ordinary warp yarns of natural fibres (asbestos-cotton) tend to stretch excessively when subjected to the tensions set up operating around the dryers and rolls of the paper machine under hot humid conditions. The addition of a controlled amount of untreated Terylene filament yarn plied with the natural fibre warp yarns tends to cause shrinkage and offset this stretching and provide a stabilized fabric keeping the felt sufficiently tight to perform its drying and driving functions.

The present invention proposes to overcome the disadvantages outlined above by the introduction of a pretreated, substantially "Terylene" weft yarn which reduces lateral shrinkage of the woven fabric to a minimum and by the introduction of a composite "Terylene" and other fibrous warp yarn which is designed to control the stretch and shrinkage of the felt in the warp-wise direction of the felt.

Proceeding now to a more detailed description, reference will be had to the accompanying drawings, in which:

FIG. 1 is a view showing the weave of a 3-ply felt of "Terylene" and composite yarns embodying this invention.

FIG. 2 is a side view of a weft yarn shown in FIG. 1.

FIG. 3 is an end view of the yarn shown in FIG. 2.

FIG. 4 is a side view of one form of a warp yarn shown in FIG. 1.

FIG. 5 is an end view of the yarn shown in FIG. 4.

FIG. 6 is a side view of another form of a warp yarn shown in FIG. 1.

Referring more particularly to FIG. 1, the dryer felt is shown to be 3-ply construction but may be of 2 or more plies, including weft yarns 5 interwoven with warp yarns

6 and 7. In the particular embodiment the warp yarns 6 interwoven with the weft yarns form a facing ply, the warp yarns 7 interwoven with the weft yarns 5 forms a backing ply and a combination of warp yarns 6 and 7 interwoven with the weft yarns 5 forms a filling ply.

As shown, particularly in FIGS. 2 and 3 each weft yarn 5 comprises a 100% filament "Terylene" core 10 which may consist of one or more strands of "Terylene" filaments twisted together. The filament or filaments of "Terylene" are pre-treated by being stress relaxed at a temperature of from about 300° F. to about 400° F. to cause a pre-shrinkage. The pre-treated core 10 is then surrounded by an asbestos-cotton or asbestos-"Terylene" staple fibre blend 11 which is spirally wound about the "Terylene" core 10 to provide a protective covering for the same.

In the warp certain of these yarns are illustrated in FIG. 4 and others are illustrated in FIG. 5. In FIG. 4 the warp yarn 6 preferably consists of a core of non-treated "Terylene" filament twisted with a cotton strand 16. The core is then surrounded by a protective covering 17 of mixed asbestos-cotton or mixed asbestos-"Terylene" fibres. This combination core and covering controls shrinkage in the warpwise direction of the dryer felt. The warp yarn 6 forms a durable face ply which resists wear on the surface of the felt. This composite warp yarn 6 also reduces the tendency of progressive stretch.

The backing ply warp yarns 7 are formed by twisting one or more strands of non-heat set "Terylene" filaments 18 with cotton yarn. This warp yarn 7 also has a controlled stretch in the warpwise direction of the dryer felt.

Where the dryer felt calls for a 3-ply construction the warps of the intermediate or filling ply may be alternately of the construction of warp yarns 6 and 7 or may be arranged substantially as shown in FIG. 1.

While the foregoing is believed to be illustrative of a preferred embodiment of this invention, it is to be understood that changes and modifications may be resorted to within the scope and spirit of this invention as defined in the appended claims.

What I claim is:

1. An improved woven dryer felt for use in the manufacture of pulp and paper products comprising weft yarns including a core of shrink resistant polyethlene terephthalic filaments with a protective covering of staple fibers wound thereover and warp yarns including a core of polyethylene terephthalic shrinkable filaments and a protective covering of staple fibers whereby shrinkage is minimized in the weftwise direction and shrinkage and expansion in the warpwise direction is permitted.

2. An improved dryer felt according to claim 1 wherein the warp yarn core includes cotton strands twisted with the shrinkable polyethylene terephthalic filaments.

3. An improved dryer felt according to claim 1 wherein the protective covering of both the weft and warp yarn comprises asbestos fibers mixed with cotton fibers.

References Cited in the file of this patent

UNITED STATES PATENTS

2,450,948	Foster	Oct. 12, 1948
2,821,771	Skeer	Feb. 4, 1958
2,865,409	Asten	Dec. 23, 1958

FOREIGN PATENTS

702,046	Great Britain	Jan. 6, 1954
708,936	Great Britain	May 12, 1954