Aug. 31, 1937. H. N. HILL 2,091,926

DRIER FABRIC

Filed May 5, 1936

Fig. 1.

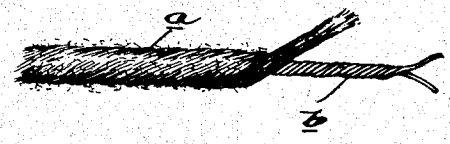


Fig. 2.

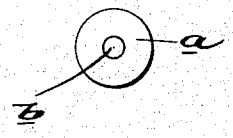


Fig. 3.

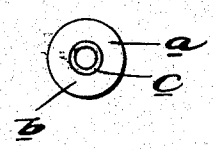
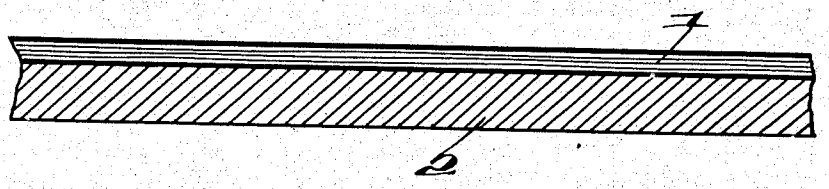


Fig. 4.



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DRIER FABRIC

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Application May 5, 1936, Serial No. 78,058

7 Claims. (Cl. 139—420)

This invention relates to drier fabrics in the form of woven webs such as employed to conduct wet materials through heated drying rolls, such, for example, as felts for paper drying machinery and aprons employed in other types of driers. It is particularly concerned with conveyor fabrics wherein asbestos fibers are incorporated at least in the working surface of the drier fabric, and primarily constitutes an improvement over the drier fabric disclosed in Asten Patent No. 1,574,592, dated February 23rd, 1926.

Because of the ability of asbestos fibers to resist heat and moisture, such material is ideally suited to the conditions to which drier felts are subjected. However, the asbestos fibers are brittle and can be successfully incorporated only into a relatively loosely twisted thread. All-asbestos threads are, therefore, relatively low in tensile strength and a satisfactory drier fabric can not readily be made solely therefrom, and it has been found necessary to incorporate cotton or other vegetable fibers in the fabric to give the same adequate tensile strength.

Because of the tendency of vegetable fiber threads to deteriorate under the conditions of heat and moisture found in drying machines, it was found that the interweaving of asbestos threads with vegetable threads in the formation of the drier fabric was not satisfactory. The Asten patent discloses a substantial improvement upon earlier designs. According to his invention vegetable fiber threads were incorporated as cores around which asbestos fibers were wound as a protective envelope. The drier fabric was then woven utilizing these vegetable fiber cored asbestos threads in both the warp and weft.

It has now been found by the present applicant that while the vegetable fiber cores in the Asten fabric are theoretically protected against the deteriorating influences of heat and moisture by the surrounding asbestos envelope, there is, nevertheless, an appreciable rotting of the vegetable fiber cores and a resulting breakdown in the fabric structure. As above mentioned, the asbestos fibers are brittle and can not be twisted sufficiently to prevent penetration of moisture and heat to the vegetable fiber cores.

It is the primary purpose of the present invention to overcome the difficulty just mentioned by positively protecting the cores of the asbestos threads against the destructive influences in such manner that the tensile strength of the threads and the drier fabric as a whole is maintained and the useful life of the fabric materially lengthened.

In the accompanying drawing:

Fig. 1 is a view on a greatly enlarged scale illustrating the thread;

Figs. 2 and 3 are diagrammatic end views to illustrate certain features relative to the thread; and

Fig. 4 is a diagrammatic view illustrating a section of a drier fabric.

According to the present invention, the thread or threads of vegetable fibers which are to form the core of the final yarn are coated or impregnated with rubber latex or other suitable waterproofing composition. The core threads may be conveniently run through a bath of the treating compound in suitable solution. A thick coating is not necessary but the operation should be carried out so that the core threads will be rendered substantially impermeable to the absorption of moisture.

Preferably the composition will be allowed to dry. After completing the treatment, the asbestos fibers will be twisted around the core and the thread is then completed.

In the thread illustrated in Fig. 1 the absorbent outer asbestos envelope is indicated at *a*, and the strengthening core is indicated at *b*, the latter as shown comprising several strands of vegetable fibers twisted together. As above explained the core *b* will be treated with a waterproofing composition. If the treatment is an impregnation the core will appear as in Fig. 2. Either incident to or in lieu of the impregnation of the core *b*, a surface coating *c* may be applied to the core which, as shown in Fig. 3, will separate the core from the surrounding envelope *a*.

The drier fabric as woven from threads made as just described will possess more enduring properties than any asbestos drier fabric heretofore known in the art. The individual threads of the fabric will have adequate power of absorption because of the ability of the asbestos envelope to take up moisture. The core, however, which is depended upon for its tensile strength will be nonabsorbent and immune to the adverse influences of heat and moisture, and thus the tensile strength will be preserved.

The drier fabric here proposed is thus characterized by threads in which the fibers of the outer envelope are inherently resistive to both heat and moisture but permit absorption of moisture into the envelope. The vegetable core or inner thread structure, which inherently is susceptible to deterioration by moisture, is rendered completely nonabsorbent without, however, in any

way interfering with its intended function of giving adequate tensile strength.

The working surface portion of the drier fabric will be composed throughout its area solely of the special asbestos threads with the impermeable core here described. It will be understood that within the scope of the invention the entire felt may be made with such threads. Ordinarily, however, threads of other materials may be utilized back of the exposed asbestos surface threads. The working surface of the drier fabric which is exposed to contact with the heated drying rolls of drying machinery is the only portion of the fabric particularly subject to destructive influences of heat and moisture, and because of the greater cost of asbestos over cotton or other vegetable threads it is usually considered desirable for purposes of economy to confine the asbestos to the working face and incorporate vegetable weft and/or warp and weft threads behind the surface portion.

Drier fabrics, such as felts for paper making machines ordinarily comprise a multiple of woven plies. Such a fabric is diagrammatically represented in Fig. 4, no attempt being made to show the details of the weave since various types of weave may be employed in utilizing the present invention. The top ply 1 provides the working surface portion of the fabric, and the same will be composed of the special cored asbestos threads illustrated in Fig. 1. It may not be necessary that in all cases both the warp and weft threads of ply 1 shall be composed of the special yarn, but ordinarily this will be the case. Below ply 1 is indicated a backing 2 which may be composed of one or several plies. Such backing may also have the special asbestos thread incorporated therein, but ordinarily for reasons of economy the backing will be composed of conventional threads of cotton or other cheap but durable material.

I claim:

1. A drier fabric having a surface section made up of threads, each having an inner core of vegetable fibers and an outer covering layer of asbestos fibers, said outer covering giving the fabric requisite absorptive power and heat resistive properties, the inner core being waterproofed against absorption of moisture taken up by the covering and giving the fabric requisite and enduring tensile strength.

2. A paper drier felt having a surface section woven of threads, individual threads of the surface section consisting of an absorbent and heat resistant outer covering layer of asbestos fibers and an inner strengthening core of vegetable fibers waterproofed against destructive influences of moisture absorbed by the outer covering.

3. A drier fabric having a surface section made up of threads, each having an outer absorbent envelope of asbestos fibers and an inner fibrous strengthening core composed of material of greater tensile strength than asbestos and treated with a waterproofing composition against absorption of moisture from the outer envelope.

4. A drier fabric having a surface ply made up of threads, each having an outer absorbent envelope of asbestos fibers and an inner core of suitable tensile strength composed of vegetable fibers, and a waterproof coating protecting the inner core against absorption of moisture taken up by the outer envelope.

5. A drier fabric having a surface ply made up of threads, each having an inner strengthening core of vegetable fibers, a protective latex layer surrounding the core, and an outer absorbent envelope of asbestos fibers.

6. A drier fabric having a surface ply made up of threads, each having an outer absorbent envelope of asbestos fibers and a rubberized textile core of vegetable fibers, said core being impervious to moisture absorbed by the outer envelope and of greater tensile strength than the envelope.

7. A drier fabric having a surface ply made up of threads, each having a heat-resistive and absorbent outer fibrous envelope and a waterproofed non-absorbent strengthening inner fibrous core impervious to moisture absorbed by the outer envelope.

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