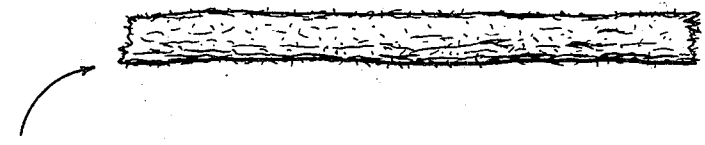
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ASBESTOS YARN

Filed May 29, 1943



ASBESTOS AND RAYON ± OTHER CELLULOSIC FIBERS e.g. COTTON.

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ASBESTOS YARN

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5 Claims. (Cl. 28—81)

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This invention relates to the production of improved yarns from asbestos.

While asbestos fibers have the advantageous properties of being resistant to fire, heat and chemicals and being rot-proof, they have shortcomings which limit their use in the production of yarns and fabrics. Asbestos fibers are slippery in character so that carding of fibers into uniform roving and drafting into yarns is difficult because of the lack of cohesion between the fibers. In addition only the higher grades of asbestos which have low percentages of short fibers can be satisfactorily converted into yarns without the use of reinforcing fibers and such yarns are relatively weak because of the inherently weak characteristic of asbestos. It has heretofore been common practice to reinforce asbestos yarns by mixing the asbestos fibers with cotton fibers.

It has now been found that if the asbestos fibers are mixed with viscose rayon fibers, the mixture is characterized by improved cohesion and better drafting qualities and the yarn produced therefrom is stronger and has a greater flexing life than a yarn made with a corresponding proportion of cotton. This improvement has been found to result irrespective of whether a bright (non-delustered) or a delustered viscose rayon is used and the improvement is so marked that the replacement of only one tenth of the cotton in an asbestos-cotton blend by viscose rayon staple fiber shows definitely improved results over the straight asbestos-cotton blend. This is unexpected and surprising because of the apparent smoothness of undelustered viscose rayon filaments.

The single figure of the drawings is illustrative of the invention.

By replacing at least one tenth up to the entire amount of cotton in an asbestos blend, it is possible to obtain (1) finer yarns from a given quality of asbestos, (2) a stronger yarn of given size from a given quality of asbestos and this is especially true when high tenacity viscose rayon staple is used specifically, (3) a yarn of given size of improved quality from a lower grade of asbestos than has heretofore been possible when using cotton; and (4) a greater yield in yarn form from the original asbestos content of the blend.

The viscose rayon fibers may be of ½ to 2 denier and preferably about 1¼ to 1½ denier in size and preferably are of a length between about 1 to 3 inches or longer. Generally the finer the denier and the shorter the staple, the greater is the improvement in asbestos yield; the larger the denier and the longer the staple, the greater the

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improvement in yarn strength and cohesion; the greater the crimp frequency of the staple, the better the yarn elasticity, asbestos yield and bulk of yarn and fabric.

Example 1

With 200 parts by weight of an asbestos of such a grade that only 2 oz./lb. were retained by a ½" mesh screen and only 3 oz./lb. were retained by a ¼" mesh screen, 30 parts by weight of a high strength viscose rayon staple fiber having a size of 1¼ denier and a length of 1⅞" were blended and formed into a yarn.

Example 2

With 200 parts by weight of the asbestos of Example 1, 15 parts by weight of cotton and 15 parts by weight of the viscose rayon staple of Example 1 were blended and formed into a yarn.

Example 3

With 200 parts by weight of an asbestos of such a grade that 7 oz./lb. were retained by a ½" mesh screen and 7 oz./lb. were retained by a ¼" mesh screen, 20 parts by weight of cotton and 10 parts by weight of a regular viscose rayon staple fiber having a size of 1½ denier and a length of 1 inch were blended and formed into a yarn.

Example 4

With 1080 parts by weight of an asbestos, 245 parts by weight of cotton and 25 parts by weight of a viscose rayon staple fiber having a size of 1 denier and a length of 2 inches were blended and spun into a yarn.

Any type of asbestos (chrysotile, amphibole, serpentine or synthetic) may be improved by blending viscose rayon staple therewith in accordance with this invention. In general, no essential difference in results has been found to be obtained from the use of viscose rayon staple fibers having a typical highly indented cross-section as compared to such fibers as are of rounder section. While it is known that the individual fibers of asbestos tend to form fibrils of minute diameter which project therefrom as a fuzz and may tend to become caught or locked in the indentations of the viscose staple, such catching is apparently of little consequence because of the ease with which such projecting fibrils may be broken or further split from main fibers. However, the use of crimped viscose staple definitely improves the elasticity and bulk and makes it possible to obtain greater yarn yield on a given weight of asbestos.

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The total proportion of organic fibers (including the rayon and cotton if it is also present) in the blend may be from 1 to 25%, and preferably from 10 to 25%, of the total weight of the blend, the balance being all or mainly asbestos. The blending of the fibers may be performed in any suitable manner or device, such as in the preparing, picking, carding, or even in the drafting operation. Preferably, however, the fibers are initially blended in the standard type of opening, blending and picking machinery of either the woolen or cotton systems or combinations thereof. The drafting may be performed by any of the drafting systems or mechanisms adaptable therefor, such as the cotton system, the woolen system, or combinations or developments thereof.

The yarns obtained may be of any character desired from fine to heavy and from soft to hard depending upon the use to which it is desired to put them. They may be used in the production of fireproof fabrics by weaving, knitting or braiding. They may also be fabricated into articles for use as electrical insulation, such as of wires; or mechanical or chemical packing materials; as gaskets; for friction elements; for heat insulation; in battery separators and for other purposes.

It is to be understood that variations may be made without departing from the spirit and scope of this invention.

I claim:

1. A yarn comprising a blend consisting of asbestos and between 10 and 25% of cellulosic fibers, at least one tenth of the cellulosic fibers being crimped viscose rayon staple fibers having a size between ½ and 2 deniers and a length between 1 and 3 inches.

2. A yarn comprising a blend consisting of asbestos and between about 10 and 25% of a crimped viscose rayon staple fiber.

3. A yarn comprising a blend consisting of asbestos and between 10 and 25% of cellulosic fibers, at least one-tenth of the cellulosic fibers being viscose rayon staple fibers having a size between one-half and two deniers and a length between one and three inches and the grade of asbestos being such that a predominant proportion thereof passes through a one-half inch mesh screen.

4. A yarn comprising a blend consisting of asbestos and between 10 and 25% of cellulosic fibers, at least one-tenth of the cellulosic fibers being crimped viscose rayon staple fibers having a size between one-half and two deniers and a length between 1 and 3 inches and the grade of asbestos being such that a predominant proportion thereof passes through a one-half inch mesh screen.

5. A yarn comprising a blend consisting of asbestos and between 10 and 25% of a viscose rayon staple fiber having a size between one-half and two deniers and a length between one and three inches, the grade of asbestos being such that a predominant proportion thereof passes through a one-half inch mesh screen.

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