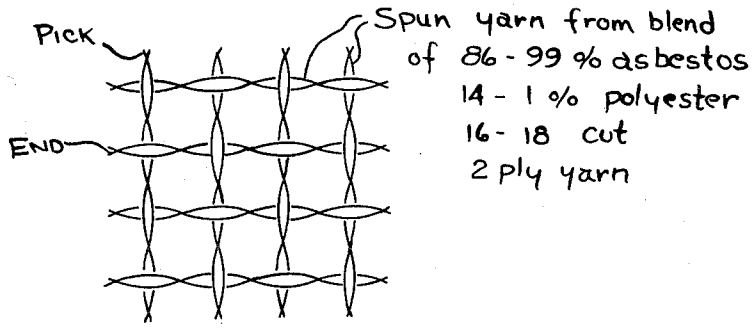
Dec. 1, 1964 I. BARNETT 3,159,187

FILTER BAG FABRIC

Filed Sept. 4, 1962



INVENTOR.
IRVIN BARNETT
BY
John A. McKinney
ATTORNEY

United States Patent Office 3,159,187 Patented Dec. 1, 1964

3,159,187

FILTER BAG FABRIC

Irvin Barnett, Martinsville, N.J., assignor to Johns-Manville Corporation, New York, N.Y., a corporation of New York

Filed Sept. 4, 1962, Ser. No. 221,327
4 Claims. (Cl. 139—420)

This invention relates to filter fabric for dust bags used in mechanical collecting systems. More particularly, this invention relates to filter fabric woven from yarns comprising a combination of asbestos and polyester fibers. Still more particularly, this invention relates to filter fabric capable of sustaining mechanical shaking at elevated temperatures.

Conventional asbestos-cotton or asbestos-rayon fabrics (90 percent asbestos) have been previously employed as filters in dust bag collection systems. The yarns employed are ordinarily formed by spinning cotton or rayon fiber with asbestos fiber. However, the deterioration of such composite yarn is very rapid when subjected to temperatures above 300° F. and to mechanical shaking. Asbestos, when used alone, is not strong enough to make a yarn acceptable for use in weaving such fabrics.

Organic fibers, such as the polyester type, including polyethylene terephthalate sold by E. I. du Pont Company under the trademark "Dacron," or the polyamide type, including nylon, can withstand mechanical shaking and abrasive action, but are not useful at temperatures exceeding 300° F.

It has been heretofore proposed to substitute polyester fibers for the cotton in asbestos yarns employed in making dryer felts used in connection with papermaking equipment. The chief function of the dryer felt is to absorb moisture from the damper paper web with which it is in supporting contact. Accordingly, the felt comprises multiple layers woven together to provide increased bulk for enhancing moisture absorption. Also, the felt is also tightly woven to provide a surface which will minimize the impressions made on the paper web. Generally, the temperatures encountered in the drying stages approach about 250° C. (482° F.).

The problems encountered in dust filter bags are substantially different from those encountered in the dryer felt art. In some instances temperatures in the order of 500° F. are encountered in dust collection systems employed in connection with heating ovens and the like. Further, the fabrics in mechanically shaken filter bags are subjected to much greater tensile stresses but are necessarily of relatively more porous weave (which tends to make them structurally weaker; e.g., to exhibit less tensile strength) than dryer felts in order to enable air, or other dust transporting medium, to escape.

Accordingly, it is a principal object of the present invention to provide a filter fabric in which the yarn consists predominantly of asbestos fiber and which yarn has the ability to sustain mechanical shaking at elevated temperatures.

It is a further object to provide a filter fabric woven from yarn which consists predominantly of asbestos fiber reinforced with polyester fiber in percentages which eliminate the deficiencies of either of the fibers when employed alone.

It is a still further object to provide a filter fabric woven from yarn consisting predominantly of asbestos fiber reinforced with polyester fiber in a form which will enhance the filtering properties of the fabric.

The drawing shows a schematic plan of a typical filter fabric to which this invention is directed.

In accordance with a preferred embodiment of this invention, it is contemplated that the filter fabric be woven of yarn consisting of at least 86 percent asbestos and a maximum of 14 percent polyester fiber in a single layer form.

In carrying out the present invention, a blend of spinning length asbestos fiber 86–99 percent and polyester fibers 1–14 percent (percentages are by weight), which may be Dacron fibers, preferably of 1¼ to 1½ denier and having a length of 1 to 2 inches, are made into a roving; the roving is then twisted into a yarn; a plurality of the yarns are preferably plied to a count of 16-cut, 2 ply to 18-cut, 2 ply; and the plied yarn is then woven into a single layer fabric of 13 to 16 ends per inch and 16 to 19 picks per inch and having a weight of 1 to 2 pounds per square yard. The term "cut" indicates the number of 100 yard units in one pound of standard asbestos yarn, and designates the cut-number of that yarn and the term "two ply" indicates the number of individual strands twisted together to comprise a single yarn. It will be apparent that the asbestos and polyester fibers may be combined in other ways, and that continuous as well as staple fibers may be employed. However, a significant aspect is that the fabric be of relatively light weight and loose weave as compared to dryer felts.

In order to further disclose the present invention, the parameters of one example of fabric that has been made and tested are now given:

Asbestos content, percent	90±2 spinning length.
Polyester content, percent	10±2 Dacron fiber 1¼ denier, 1¼ in. length.
Yarn count	18-cut, 2 ply W+F.
Weave	Plain.
Construction—	
Ends/in.	14.
Picks/in.	17.
Weight	1.35 lb./ sq. yd.

The above-described fabric was exposed to 430° F. temperature for 120 hours and then tested for tensile strength. It was found that the fabric had a tensile strength 108 percent of its original tensile strength before exposure to the elevated temperature. In contrast, a conventional asbestos-cotton fabric (90 percent asbestos) tested under the same conditions only retained 35 percent of its original tensile strength.

Having thus described my invention in rather full detail, it will be understood that these details need not be strictly adhered to but that various changes and modifications may suggest themselves to one skilled in the art, all falling within the scope of the invention as defined by the subjoined claims.

What I claim is:

1. A filter fabric adapted to withstand elevated temperatures and mechanical shaking characterized in that said fabric is woven in a single layer from yarn consisting essentially of 86–99 percent asbestos fibers of spinning length and 14–1 percent polyester fibers and has a weight of 1 to 2 pounds per square yard, the weave of said fabric having 13–16 ends per inch and 16–19 picks per inch.

2. A single layer filter fabric adapted to retain its original tensile strength after exposure to a temperature of at least 400° F. for at least 120 hours woven from yarn consisting essentially of 90 percent asbestos fiber and 10 percent polyester fiber, said fabric having a weight of 1 to 2 pounds per square yard, and the weave of said fabric having 13–16 ends per inch and 16–19 picks per inch.

3. A single layer filter fabric adapted to retain its original tensile strength after exposure to a temperature of at least 400° F. for at least 120 hours woven from yarn, warp and fill, blended from and consisting essentially of 86–99 percent asbestos fiber and 14–1 percent polyester fiber, said polyester fiber being of 1¼ to 1½ denier and 1 to 2 inches in length, the cut of said yarn being 16-cut,

2 ply to 18-cut, 2 ply, the weave of said fabric having 13–16 ends per inch and 16–19 picks per inch, and the weight of said fabric being 1 to 2 pounds per square yard.

4. A single layer filter fabric adapted to retain its original tensile strength after exposure to a temperature of at least 400° F. for at least 120 hours woven from yarn, warp and fill, blended from and consisting essentially of 90 percent asbestos fiber and 10 percent polyester fiber, said polyester fiber being of 1¼ denier and 1¼ inch length, the cut of said yarn being 18-cut, 2 ply, the weave of said fabric having 14 ends per inch and 17 picks per inch, and the weight of said fabric being 1.35 pounds per square yard.

References Cited by the Examiner

UNITED STATES PATENTS

2,506,667	5/50	Hall	139—420
2,947,328	8/60	Asten et al.	139—420

FOREIGN PATENTS

577,623	5/46	Great Britain.

MERVIN STEIN, *Primary Examiner.*

RUSSELL C. MADER, DONALD W. PARKER, *Examiners.*