SYNTHETIC MATERIAL TEXTILE FILAMENTS

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ABSTRACT

A synthetic material textile filament comprises an elongated core, a plurality of ribs around the core, each rib extending along the core, and a plurality of notches in the ribs distributed along the filament.

6 Claims, 5 Drawing Figures
SYNTHETIC MATERIAL TEXTILE FILAMENTS

This invention relates to synthetic material textile threads or yarns, hereinafter designated by the general term "filaments."

According to the main aspect of the invention, a synthetic material textile filament comprises an elongated core, a plurality of ribs around the core, each rib extending along the core, and a plurality of notches in the ribs distributed along the filament.

The invention also concerns a method of manufacturing such textile filaments, comprising forming the elongated core with a plurality of ribs extending therealong, and cutting notches in the ribs at intervals along the filament.

Another aspect of the invention is a yarn, rope or fabric comprising at least one such textile filament spun, twined, or woven respectively, so that a plurality of the notches of the filament are located at the surface of the yarn, rope or fabric.

The invention will now be described by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is a perspective view of a greatly enlarged scale of a length of textile filament according to the invention.

FIG. 2 is a transversal cross-section along line II—II of the textile filament of Fig. 1.

FIGS. 3 and 4 are side elevational views of two varied embodiments of textile filament, and

FIG. 5 is a schematic view of a length of rope formed using filament according to the invention.

Referring to FIGS. 1 and 2, a textile filament in synthetic material, such as polyamide fibers or other material of this type, comprises a core 1 having, in transversal cross-section, a generally circular shape with a diameter d1. This core is surrounded by three ribs 2 extending along the entire length of the filament and forming lobes equidistantly arranged about the core 1. The circumscribing circle about these lobes 2 has a diameter d2. Notches 3 are provided at regular intervals in the ribs 2. In FIG. 1, the notches 3 are helicoidally distributed along and around the filament with a pitch of 0.5 mm, for example. The depth of the grooves 3 extends to a diameter d3 slightly greater than diameter d2 to avoid any weakening of the core 1 which could lead to breakage of the filament.

The median plane of each notch 3 in relation to the axis of the filament can be comprised between 10° and 90°. This angle shown by the letter α in FIGS. 3 and 4, is chosen according to the use to which the textile filament is to be put. FIG. 3 shows a filament in which angle α has a value of the order of 15° to form notches 3 which form hooking asperities with strong grip or hooking properties, whilst FIG. 4 shows a filament in which this angle reaches 90° to form weakly gripping notches.

Of course, the number of ribs 2 of the filament could be two, or more than three.

The manufacture of such a textile filament can take place after or during shaping of the filament by extrusion, for example by means of a drawing plate, by cutting the ribs 2 at regular intervals, by means of a cutter driven about the filament whilst the latter is longitudinally moved, for example.

This filament can find applications in many different fields. It can advantageously be used for the manufacture of anti-slip fabrics and ropes, hair curlers, carpets, brushes and brooms, and filters.

FIG. 5 schematically shows a length of rope or yarn of which at least a part of the twisted threads at the surface is formed of the filament with notches 3, of the type shown in FIG. 1. One notched filament 9 has the notches open in a certain direction (upwardly in FIG. 5), whilst the adjacent filament 10 has its notches 3 open in the opposite direction, that is to say facing downwardly. Such a rope or yarn thus has remarkable anti-slip properties. Of course, it would also be possible to spin or twine such yarn or rope using filaments the notches 3 of which are all open in one direction, which would make the yarn or rope slippable in one direction but anti-slip in the opposite direction. Such ropes could be used for mooring devices and notably for any nautical ropes.

Instead of using a turning cutter to form the notches 3 in the ribs 2 of the filament with core 1, it would also be possible to use a Rotary Milling cutter or a toothed wheel which impresses its teeth in the ribs 2 to form these notches 3. These operations can be carried out hot at the moment of extrusion and in the setting zone of the material forming the filament. Fabrics made with this filament can be used as scrapers, polishing members, brooms, brushes, filters or as special use fabrics, such as an anti-slip carpets.

The retaining force of such a notched filament is large, in view of the large number of notches 3 on each strand.

When such notched filaments are used for the manufacture of fabrics, the drawbacks arising from slip of the yarns in relation to one another, which are particularly notable with synthetic material yarns, can be eliminated.

We claim:

1. A method of manufacturing a synthetic material textile filament, comprising forming an elongated core with a plurality of ribs extending therealong, and cutting a plurality of notches in the ribs at intervals along the filament, the angle formed between the median plane of each notch and the axis of the filament being between 10° and 60°.

2. A method according to claim 1, in which a cutter is driven around the core to cut notches in the ribs while the filament is longitudinally moved in relation to the cutter.

3. A synthetic material textile filament, comprising an elongated core, a plurality of ribs extending longitudinally thereof, a plurality of notches in said ribs helicoidally distributed along said filament, said core being of substantially circular transversal cross-section, said ribs projecting from the core in the manner of lobes, wherein the angle formed between the median plane of each notch and the axis of the filament is between 10° and 60°.

4. A synthetic material textile filament as claimed in claim 3 wherein the depth of said notches is less than the outer diameter of said ribs but larger than the diameter of said core to avoid weakening of the core.

5. A yarn, rope or fabric comprising at least one synthetic material textile filament, said filament comprising an elongated core, a plurality of ribs extending
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3. Longitudinally thereof, a plurality of notches in said ribs helicoidally distributed along said filament, said filament being spun, twined or woven so that a plurality of said notches are located on the surface of said yarn, rope or fabric, the angle formed between the median plane of each notch and the axis of the filament being between $10^\circ$ and $60^\circ$.

4. A yarn, rope or fabric as claimed in claim 3, comprising a plurality of textile filaments, the notches of some textile filaments being inclined in one direction, and the notches of other textile filaments being inclined in another direction.

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