Yarn reel with a gradually narrowing v-shape slot cut therein, having a rough surface comprising reverse fish scales

Garnhülse mit Fadenklemmschlitz

Tube de bobine pour fils textiles à entaille de retenue du fil

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Proprietor: NAN Y A PLASTICS CORPORATION
Taipei (TW)

Inventor: Jen, Zo-Chun
Tai-Shan Hsian, Taipei Hsien (TW)

Representative: Grünecker, Kinkeldey,
Stockmair & Schwanhäusser Anwaltssozietät
Maximilianstrasse 58
80538 München (DE)

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to an improvement of yarn guide slots setting on the reel surface for winding, and, more particularly to the improvement of yarn grip capability by circumferential surface. This guiding the yarn winding process with four gradually narrower slots cut on the reef circumferential surface. This construction of yarn reel will provide the advantages of highly recycled yarn reel itself when the yarn being departed from the direction of winding yarn.

2. Description of the Prior Art

[0002] In the automatic operation of yarn winding, it usually involve the step of guiding a yarn to the right position to be smoothly wound around a yarn reel for a great number of times. While leading the yarn to a yarn guide slot for winding process, the yarn's tension will be decreased instantly and sharply because of the sudden drop of winding speed. Accordingly, the yarn can't be gripped easily and smoothly by the reel and consequently can't perform a consistent and high quality job for yarn winding.

[0003] Due to the production technique of man-made fibers is updated rapidly, the production of man-made fibers pursues for high speed and diameter's minimization. In addition, because environmental issue is highly regarded the recycling of yarn reel is also a focus of related invention. Recently, some construction improvements of yarn reel are disclosed concerning the enhancement of yarn grip while in mass production. FIG. 1 and FIG. 2 are Japanese Utility Model Patent no. 3-030378 and no. 7-35457 application respectively. FIG. 3 is ROC Utility Model Patent application no 85205795.

[0004] All of them show a conventional yarn reel having either opposite "Z" shape and saw-tooth shape in their slots, or narrowed the slot surface of the reel body in order to improve their capability of yarn grip. However, either "z" or saw-tooth shape is too sharp while the yarn is produced in high speed, and thus cause some yams are not easily departed from the slot. However, present invention utilizes gradually diminished width for slots and reverse fish scales forming rough surface can easily prevent the defects of traditional yarn reels.

SUMMARY OF THE INVENTION

[0005] It is an objective of this invention to provide an improvement of yarn grip capability by cutting different widths and shapes of slots set on the circumferential surface of the reel. Thus, a yarn can be moved thereon smoothly without sticking or interruption. The present invention make the yarn winding cost reduced and the yarn winding result upgraded

[0006] It is another objective of this invention to provide an improved construction of yarn reel for reducing the surface and yarn damage to enable the recycling frequency of the reel and cut down the cost and good for environmental protection

[0007] It is a further objective of this invention to provide a yarn reel construction easily and efficiently produced fit for high-speed production of man-made fibers.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a perspective view of Japanese Utility Model Patent no. 3-030378.
FIG. 2 is a perspective view of Japanese Utility Model Patent, application no.7-35457.
FIG. 3 is a perspective view of ROC Utility Model Patent application no 85205795.
FIG. 4 is a perspective view of this invention.
FIG. 5 is a sectional perspective view of this invention.
FIG. 6 is a sectional view showing the details of wide slot, middle-wide slot, narrow slot, and elongated slot disposed in FIG. 4.
FIG. 7 showing the construction of reverse fish scales of this invention.
FIG. 8 showing the details of the open angle, the hook angle, and the guiding slope disclosed in FIG. 4.

[0009] Numerals used in this specification

1: reel body;
2: wide slot;
3: middle-wide slot;
4: narrow slot;
5: elongated slot;
6: dent;
7: dent;
8: open angle
9: guiding slope;
10: yarn hook angle;
11: upper slope of "V"-shape wide slot;
12: lower slope of "V"-shape wide slot;
13:"V"-shape slope of narrow slot;
14: yarn;
15: yarn guiding direction;
16: reverse fish scale shape;
17: rotation direction of the yarn reel
6A-6A: sectional view of wide slot;
6B-6B: sectional view of middle-wide slot;
6C-6C: sectional view of narrow slot;
6D-6D: sectional view of elongated slot;
DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0010] Referring to FIG. 4, which shows the perspective view of this invention that indicates construction by numbers; 1: reel body; 2: wide slot; 3: middle-wide slot; 4: narrow slot; 5 elongated slot; 6, 7: dents; 8: open angle; 9: guiding slope; 10: yam hook angle. FIG. 5 is a portion of the partial sectional view showing the V-shape wide slot 2, V-shaped middle-wide slot, narrow slot, and elongated formed by cutting and pressing at an upper area of the reel body 1. Sectional views of details referring to those slots are disclosed by lines 6A-6A, 6B-6B, 6C-6C, and 6D-6D shown in FIG. 6, which clearly shows that the FIG. 6 also shows that at the lower slope 12 of the wide slot and the v-shape slope 13 of narrow slot, both sides are cut with many reverse fish scale shapes 16 with a direction opposite to the yam guiding direction 15 direction to form rough surface like shown in FIG. 7. At the upper slope 11 of wide slot, it is cut an open angle 8 shown in FIG. 8, having a guiding slope 9 and an opposite direction to the yam guiding direction 15. The rotation direction of the yarn reel is shown as arrow 17.

[0011] Wide slot 2 is the start section for yarn entering while in the process of being automatically or manually wound. Its main purpose is to guide the yam entering the slot smoothly and to prevent the yarn efficiently. A specially treated cutting device is used to cut the reverse fish scale shape 16 opposite to the yam guiding direction 15, right on two sides on the lower slope 12 of wide slot to form the rough surface like shown in FIG. 6. The rough surface can increase the friction force between the yarn surface and yam to significantly upgrade the yarn grip capability. In the meanwhile, the lower slope width of wide slot will become narrower due to the construction of the reverse fish scale surface, and accordingly, can reduce the instant linear speed of guiding the yarn.

[0012] In order to upgrade the cut-off function of yarn, the upper slope 11 of wide slot is cut an open angle 8 opposite to the yam guiding direction 15. This open angle is set at 45-60 degrees with the center-line of wide slot, and is positioned two or three at one or two sides of wide slot. The yarn hook angle 10 is about 4-7 mm long, as shown in FIG. 8, which will be naturally formed when using the special cutting device for making the open angle. It provides the function of yam cutting and gripping. The guide slope 9 is about 10-20 mm long and is set next to the open angle to lead the yarn entering the angle precisely.

[0013] The middle-wide slot 3 is located following the wide slot 2 with a width about one fifth to one sixth of wide slot. It acts as a bridge to be able to deliver the yarn from wide slot to the narrow slot smoothly in order to slow down the tension variation in the yarn winding.

[0014] The narrow slot 4 is located right behind the middle-wide slot. As disclosed in FIG. 6, the two sides of its V-shape slope 13 are cut a number of reverse fish scale shapes opposite to the yam guiding direction to form a rough surface. This surface can increase the friction force between it and the yam, and will thus reduce the probability of yarn sliding in the slot.

[0015] The elongated slot 5 is positioned right behind the narrow slot with a circumferential length about 50-60 mm, providing a function for cutting off the yam as it enters this slot.

[0016] On the surface of narrow slot or elongated slot could be pressed some dents 6, 7 as shown in FIG. 4 to prevent the yam departing from the slot.

[0017] Lastly, because both the directions of the reverse fish scale shape 16 and open angle 8 are opposite to the direction of yam guiding direction 15, when the yam 14 is guided into the slot, the yam grip capability will be excellent. On the other way, when the yam is departed from the reel from the reverse direction, all the slot surfaces and yam departing direction become the same and can be easily departed from the reel. As a result, this invention can be recycled without losing its quality.

Claims

1. A yarn reel comprising yam guiding slots (2,3,4,5) positioned circumferentially one after the other on the peripheral surface of the reel, characterised by a V-shape wide slot (2), a v-shape middle-wide slot (3), a narrow slot (4) and an elongated slot (5) arranged in sequence with widths thereof gradually set smaller and smaller from the V-shape wide slot (2) to the elongated slot (5), the V-shape wide slot (2) being cut to be an open angle (8) having a guiding slope (9) at an upper slope thereof, the slot including cuts having a plurality of reverse fish scale shapes (16) orientated opposite to the yam guiding direction (15) to form rough surfaces on both sides of a lower slope of the V-shape wide slot (2), wherein the v-shape middle-wide slot (3) is located following the V-shape wide slot (2) with a width about one fifth to one sixth of the V-shape wide slot (2), and the narrow slot (4) includes a plurality of reverse fish scale shapes (16) orientated in a direction opposite to the yam guiding direction (15) to form rough surfaces on both sides of the v-shape slope of the narrow slot (4).

Patentansprüche

1. Gamspule, die Garn-Führungsschlitzte (2, 3, 4, 5) umfasst, die in Umfangsrichtung hintereinander an der Außenfläche der Spule angeordnet sind, gekennzeichnet durch einen V-förmigen breiten Schlitz (2), einen V-förmigen mittelbreiten Schlitz (3), einen schmalen Schlitz (4) und einen länglichen...
Schlitz (5), die der Reihe nach angeordnet sind, wobei ihre Breiten von dem V-förmigen breiten Schlitz (2) zu dem länglichen Schlitz (5) zunehmend kleiner eingerichtet sind und der V-förmige breite Schlitz (2) so geschnitten ist, dass er ein offener Winkel (8) mit einer Führungsschräge (9) an einer oberen Schrägen desselben ist, und die Schlitz Einschnitte enthalten, die eine Vielzahl umgekehrter Fischschuppenformen (16) aufweisen, die entgegengesetzt zu der Garn-Führungsrichtung (15) ausgerichtet sind, um raue Flächen an beiden Seiten einer unteren Schrägen des V-förmigen breiten Schlitzes (2) zu bilden, wobei der V-förmige mittelbreite Schlitz (3) auf den V-förmigen breiten Schlitz (2) folgend mit einer Breite von ungefähr einem Fünftel bis zu einem Sechstel des V-förmigen breiten Schlitzes (2) angeordnet ist, und der schmale Schlitz eine Vielzahl umgekehrter Fischschuppenformen (16) enthält, die in einer Richtung entgegengesetzt zu der Garn-Führungsrichtung (15) ausgerichtet sind, um raue Flächen an beiden Seiten der V-förmigen Schrägen des schmalen Schlitzes (4) zu bilden.

Revidications

1. Bobine de fil comprenant des entailles de guidage de fil (2, 3, 4, 5) positionnées circonférentiellement les unes après les autres sur la surface périphérique de la bobine, caractérisée par une entaille large en forme de V (2), une entaille moyennement large en forme de V (3), une entaille étroite (4) et une entaille allongée (5) disposées les unes après les autres et dont les largeurs sont progressivement de plus en plus étroites à partir de l'entaille large en forme de V (2) jusqu'à l'entaille allongée (5), l'entaille large en forme de V (2) étant taillée pour former un angle ouvert (8) comportant une pente de guidage (9) au niveau d'une pente supérieure de celle-ci, les entailles comprenant des encoches comportant plusieurs motifs en forme d'écaillies de poisson (16) inversées et orientés dans le sens inverse de la direction de guidage (15) du fil pour constituer des surfaces rugueuses de part et d'autre d'une pente inférieure de l'entaille large en forme de V (2), l'entaille moyennement large en forme de V (3) étant située à la suite de l'entaille large en forme de V (2) et ayant une largeur d'environ un cinquième à un sixième de celle de l'entaille large en forme de V (2), et l'entaille étroite (4) comprenant plusieurs motifs en forme d'écaillées de poisson (16) inversées et orientés dans le sens inverse de la direction de guidage (15) du fil pour constituer des surfaces rugueuses sur les deux côtés de la pente en forme de V de l'entaille étroite (4).
FIG. 6

FIG. 7