June 4, 1963 H. J. STEELE 3,091,910

FALSE-TWISTING DEVICES FOR FIBRES OR FILAMENTS

Filed Dec. 15, 1961

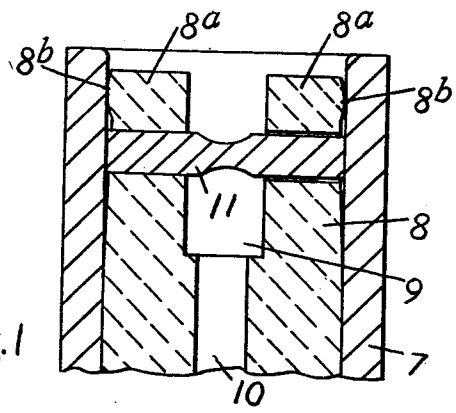


Fig.1

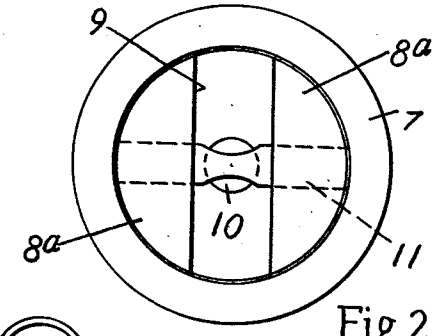


Fig.2

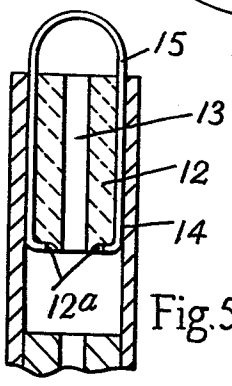


Fig.5

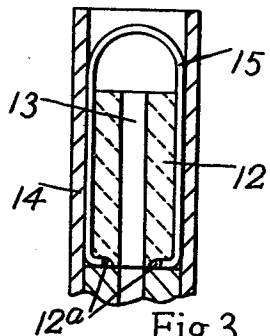


Fig.3

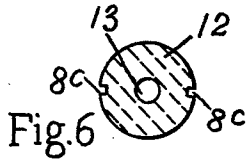


Fig.6

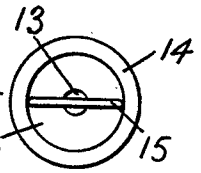


Fig.4

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3,091,910

FALSE-TWISTING DEVICES FOR FIBRES OR FILAMENTS

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Claims priority, application Great Britain Dec. 19, 1960
3 Claims. (Cl. 57—77.33)

The invention relates to false-twisting devices, as used, for example, for imparting a wool-like crimp to artificial fibres or filaments.

The object of the invention is to provide an improved construction of such a device.

A false-twisting device according to the invention comprises the combination of a hollow spindle, a hollow carrier formed from a resiliently expansible material located within the spindle from which it is axially withdrawable, and a member extending at least in part transversely relative to the carrier, and around which a fibre or filament passing through the spindle and carrier is intended to be passed, the arrangement being such that at least the major portion of the carrier is normally a clearance fit within the spindle, but when the latter is rotating within a speed range at which the device is intended to operate, the carrier will be expanded by centrifugal forces to form an interference fit within the spindle to prevent relative angular movement.

In the accompanying drawings FIGURES 1 and 2 respectively are a sectional side view and an end view of one example of the invention, FIGURES 3 and 4 respectively are a sectional side view and an end view of a modified construction, FIGURE 5 is a view similar to FIGURE 3 showing the carrier partially withdrawn for loading, and FIGURE 6 is a cross-section through the carrier.

Referring first to FIGURES 1 and 2 of the drawings, there is provided a hollow spindle 7 having a cylindrical axial bore, and which is adapted to be rotated by any convenient means at speeds in the region of 200,000 r.p.m. For this purpose the spindle may be supported by means of an air lubricated bearing.

Within one end of the spindle 7 is located a cylindrical carrier 8 formed from nylon or other resiliently expansible material. The outer end of the carrier 8 incorporates a diametrically extending slot 9 which divides this end into a pair of part cylindrical limbs 8^a, whilst from the base of the slot a bore 10 extends axially through the carrier. Moreover, extending transversely between the limbs 8^a is a hardened steel, or refractory pin 11 which is diametrically disposed relative to the carrier as a whole. One end of the pin is an interference fit within the one limb 8^a whilst the other end is free to slide within the other limb 8^a to permit of radial expansion of the carrier as will be described. Furthermore, the portion of the pin between the limbs may be waisted to form a neck around which the thread is to be passed.

The major portion of the carrier 8 is normally a clearance fit within the bore of the spindle 7. However, the clearance is so arranged in relation to the resilience of the carrier and the speed at which the spindle is intended to rotate, that when the spindle is rotating within its normal speed range, the carrier will become an interference fit within the spindle due to its radial expansion under the action of centrifugal forces. However on the periphery of the outer ends of the limbs are formed ribs 8^b which at all times resiliently grip the internal periphery of the spindle to retain the carrier therein until positively withdrawn.

In use the fibre or filament to be twisted is threaded

through the bore 10 of the carrier and around the waist of the pin 11 and then passed to apparatus for drawing the thread through the device. In order to enable the fibre or filament to be engaged readily around the pin, the carrier can be withdrawn axially from the spindle against the resilient grip imposed by the ribs 8^b.

In the modification of the invention shown in FIGURES 3 to 6 a carrier 12 has an axial bore 13 extending throughout its length and is wholly a clearance fit within a hollow spindle 14. Moreover, it incorporates a pair of diametrically opposite longitudinally extending grooves 8^c in which are located the limbs of a substantially U-shaped length of resilient wire 15. In this modification the fibre or filament is intended to be passed around the intermediate and transversely extending part of the wire 15 at the outer end of the carrier 12, and the limbs of the wire are bowed to provide the initial resilient grip on the spindle, the extremities of the limbs being bent towards one another into recesses 12^a in the inner end of the carrier to limit relative longitudinal movement of the wire and carrier.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A false-twisting device for strands in the form of fibres or filaments, comprising in combination a rotatable hollow spindle, an elongated hollow cylindrical carrier which is made of resiliently expansible material, and which is withdrawably mounted coaxially within an end portion of said hollow spindle so as to be rotatable with the latter, and so that the strand to be twisted can extend longitudinally through the interiors of said spindle and said carrier, and a member which is carried by, and extends at least in part transversely relative to, said carrier so that the strand extending through the interiors of said spindle and said carrier can pass around a portion of said member, said carrier normally having a clearance between at least the major portion of its outer periphery and the adjacent inner peripheral portion of said spindle so that when the latter is rotated at a predetermined speed said carrier will be centrifugally expanded to provide an interference fit within said spindle, and thereby ensure that said carrier is rotatable at the same speed as said spindle.

2. A false-twisting device according to claim 1, wherein the outer end portion of said carrier is divided by a transverse slot into a pair of limbs between which said member extends, and which are provided with external ribs in resilient gripping contact with adjacent portions of the internal periphery of said hollow spindle, said member having the form of a pin which at one end has an interference fit within a hole in one of said limbs, and which at its opposite end is slidably supported within a hole in the other of said limbs so as to permit radial expansion of said carrier.

3. A false-twisting device according to claim 1, wherein said member consists of a U-shaped length of resilient wire having a pair of bowed limbs which are in engagement respectively with a pair of diametrically opposite longitudinal grooves in the outer periphery of said carrier, and which are in resilient gripping contact with adjacent portions of the internal periphery of said hollow spindle.

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