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L. S. MEDLYCOTT ET AL

3,303,733

PRODUCTION OF STAPLE FIBRE FROM CONTINUOUS FILAMENTS

Filed Aug. 6, 1964

3 Sheets-Sheet 1

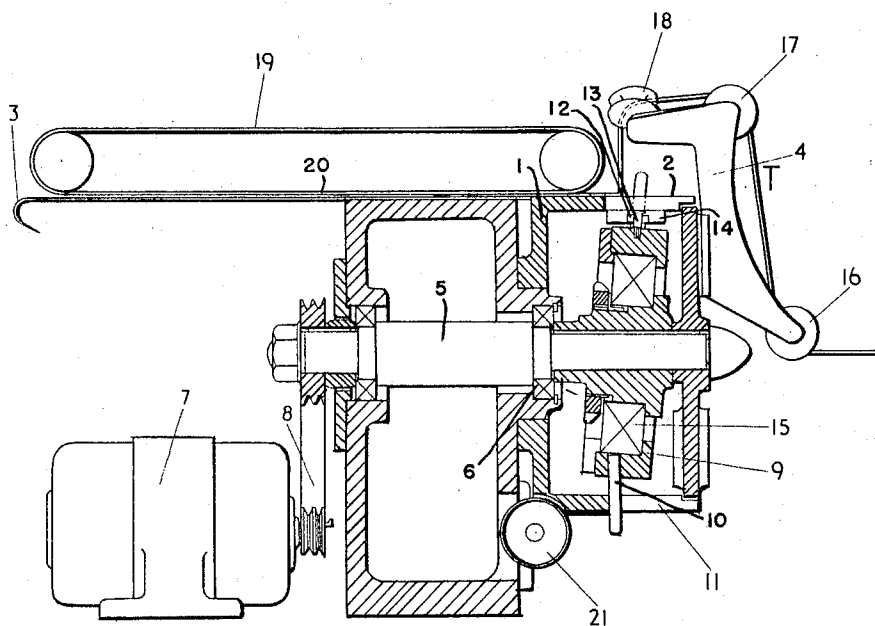


FIG. 1

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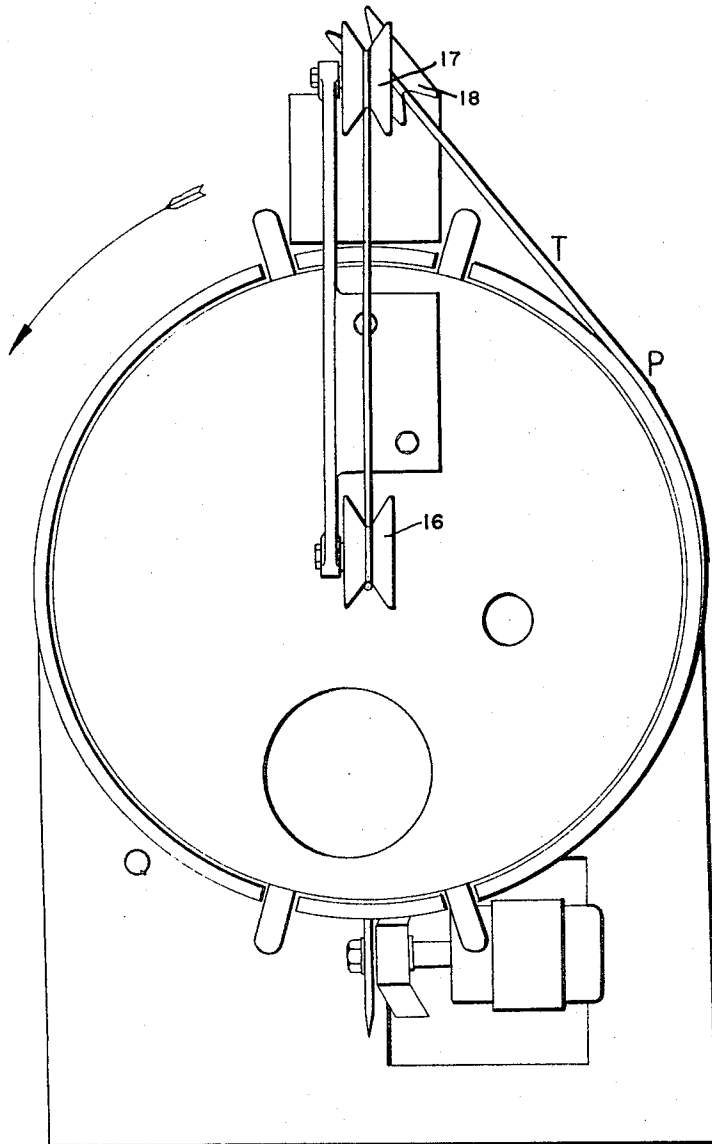


FIG. 2

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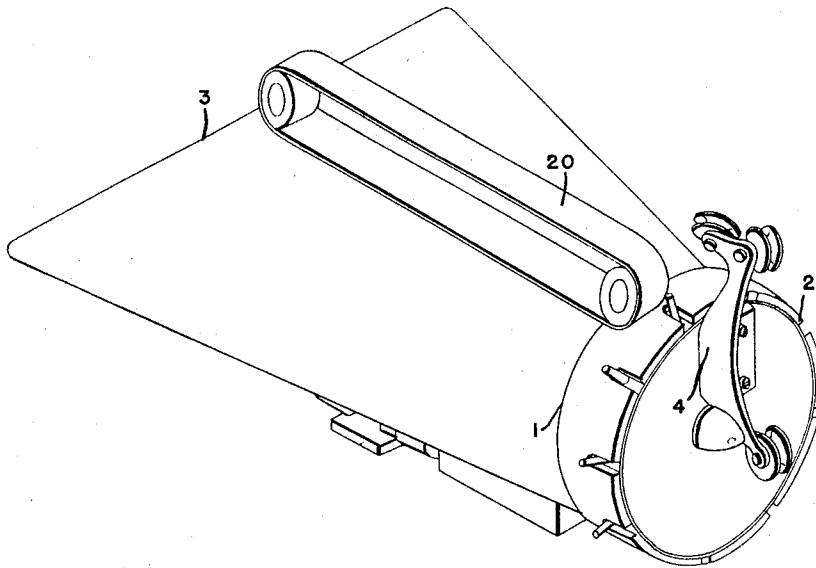


FIG. 3

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PRODUCTION OF STAPLE FIBRE FROM CONTINUOUS FILAMENTS

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30,975/63
4 Claims. (Cl. 83-83)

The present invention relates to the production of staple fibres from continuous filaments of synthetic polymer, and in particular to the production of long staple fibres adapted for use in the manufacture of ropes and the like.

It is an object of the present invention to provide long staple fibres cut into desired substantially equal lengths and to obviate multi-length, over-length or under-length fibres.

It is a further object of the invention to provide an apparatus for the production of such long staple fibres which will discharge the cut fibres continuously in a manner such that they lie parallel with each other and with their ends aligned.

According to the present invention, apparatus for the production of staple fibres from continuous filaments is characterised by the use of cutting means associated with a filament supporting former being of substantially round section at one end and its surface altering gradually along its length to a substantially horizontal flat section at the other end.

Further according to the present invention, apparatus for the production of staple fibres from continuous filaments comprises a filament supporting former being of substantially round section at one end and its surface altering gradually along its length to a substantially flat section at the other end, said former being adapted to receive continuous filaments fed to said round section end, yarn retaining means adapted to hold said filaments against said round section end in a close-wound helix, and cutting means arranged to co-operate with said former, the arrangement being such that in operation the cutter severs the retained filaments into lengths equal to the periphery of said round section, and the pressure exerted by the continuously fed filaments urges the severed lengths over the surface of the former towards said flat section.

Auxiliary feeding means may be provided to assist the movement of the severed lengths along the former towards the flat section.

The substantially round section may be slightly elliptical but is preferably circular, and the length of its periphery is determined by the length of staple fibres to be produced.

The present invention further comprises a method for the production of staple fibres from continuous filaments and staple fibres produced thereby.

A preferred embodiment of the present invention will now be described by way of example with reference to the accompanying drawings in which:

FIG. 1 is a vertical cross-section of a long staple cutting apparatus,

FIG. 2 is an end elevation of FIG. 1, and

FIG. 3 is a perspective view, on a reduced scale, showing the apparatus in operation.

Referring to the drawings, tow-cutting apparatus according to the invention comprise a former 1 being of circular section at one end 2 of its surface 20, altering gradually along its length to a flat horizontal section at its end 3. The former 1 is constructed from a sheet of metal, one edge of which is bent to form the circular end 2 whilst the opposite edge is maintained flat to form the end 3.

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A flyer assembly 4 is mounted on a shaft 5, passing through the centre of the circular end 2 of the former 1, and mounted on bearings 6. The shaft 5 is connected to an electric motor 7 by a belt drive 8 and in operation the flyer assembly 4 is driven round the end 2 of the former 1 to feed tow T onto the periphery of the former 1.

A canted, non-rotating ring 9 is also mounted on the shaft 5 and the periphery of the ring 9 is provided with a plurality of pegs 10 which mesh with slots 11 provided in the former 1 without contacting the sides of the slots. A separate internal peg 12 provided with bearings 13 running in guides 14 resists the torsional load imparted in operation by bearing 15 and ensures free movement of the pegs 10 within the slots 11. When the shaft 5 and the flyer assembly 4 are rotated, the canting of the ring 9 causes the pegs 10 to reciprocate axially in the slots 11. The flyer assembly 4 and the ring 9 together rotate in an anti-clockwise direction as shown in FIG. 2, the tow T passing over guide pulleys 16, 17 and 18 in turn, pulley 18 being angled to produce a tangential lay of the tow T on to the former 1. The canting of the ring 9 is so arranged that each peg 8 is at one extreme position of its reciprocating movement at point of lay P of the tow T, and at the other extreme position of its reciprocating movement at point Q diametrically opposed to point P across end 2 of the former 1. By this means the tow T is gradually advanced in a spiral manner and after a few revolutions of the flyer assembly 4 is engaged by a belt 19 which assists the movement of the tow T along the upper surface 20 of the former 1. A cutting blade 21 is located beneath the former and a few turns after the tow is engaged by the belt 19 the tow meets the cutting blade 21, the arrangement being such that the cut lengths of tow are held against the former 1 by the belt 19 bearing on the middle portions of the cut lengths, so that their rate of travel along the upper surface 20 of the former 1 and of their discharge from its end 3 are controlled by the belt 19. The shape of the former 1 and the angle to the horizontal of its upper surface 20 are so chosen in relation to the coefficient of friction between the material of the cut tow and the construction material of the former that at the end 3 of the former cut lengths of tow lie substantially parallel to one another with their ends in alignment and following two parallel paths so that they lie at right angles to the direction of discharge.

Thus the apparatus is fed with a continuous tow and discharges substantially equal cut lengths in a most acceptable manner, i.e., parallel and aligned with their axes normal to the direction of discharge.

What we claim is:

1. Apparatus for the production of staple fibres from continuous filaments comprising a filament supporting former of substantially round section at one end with its surface altering gradually along its length to a substantially horizontal flat section at the other end, and cutting means cooperating with said former for cutting continuous filaments on said former into staple fibres.

2. Apparatus for the production of staple fibres from continuous filaments comprising a filament supporting former being of substantially round section at one end and its surface altering gradually along its length to a substantially flat section at the other end, said former being arranged and adapted to receive continuous filaments fed to said round section end, yarn retaining means adapted to hold said filaments against said round section end in a close-wound helix, and cutting means arranged to co-operate with said former, the arrangement being such that in operation the cutter severs the retained filaments into lengths equal to the periphery of said round section, and the pressure exerted by the continuously fed

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filaments urges the severed lengths over the surface of the former towards said flat section.

3. Apparatus according to claim 2, wherein auxiliary feeding means are provided to assist the movement of the severed lengths along the former towards the flat section. 5

4. Apparatus according to claim 3, wherein the auxiliary feeding means is a conveyor belt arranged above

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the surface of the former so as to engage severed lengths being urged over said surface.

References Cited by the Examiner

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