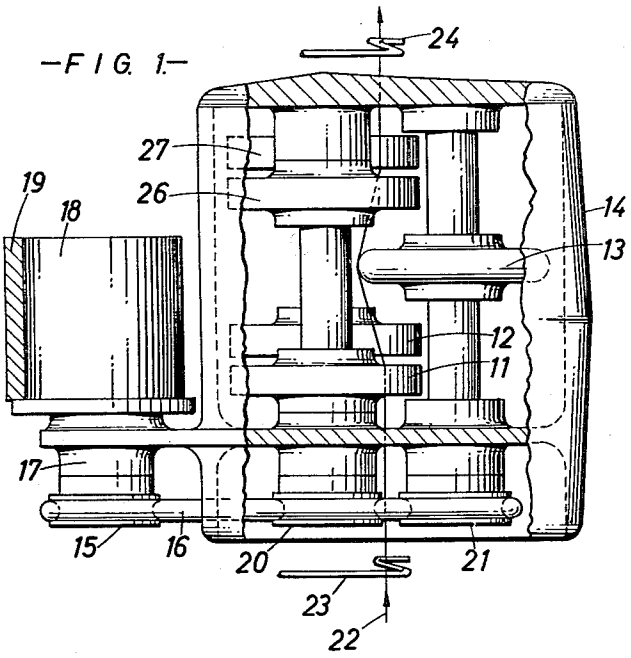
June 7, 1960 A. DOBSON 2,939,269

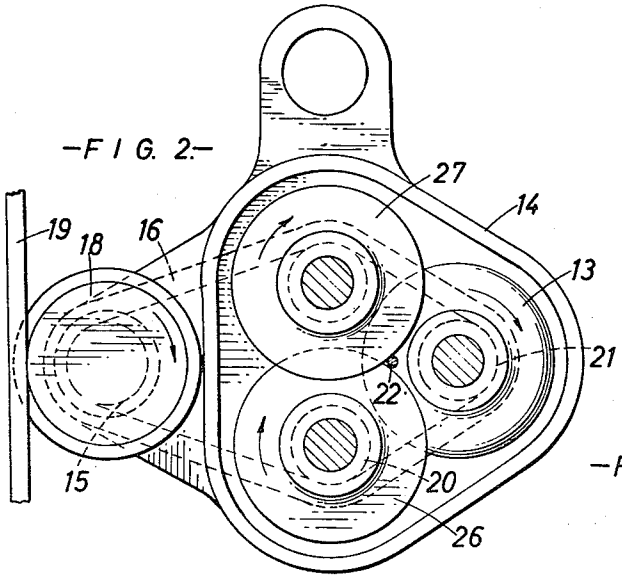
APPARATUS FOR TWISTING AND/OR CRIMPING YARN

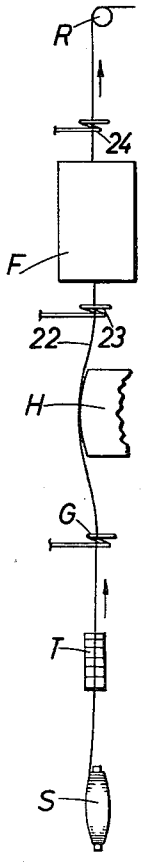
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—F I G. 1.—



—F I G. 2.—





—F I G. 3.—

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APPARATUS FOR TWISTING AND/OR CRIMPING YARN

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3 Claims. (Cl. 57—77.4)

The present invention concerns a device for imparting false twist to a textile yarn and, more especially, is concerned with the production of crimped yarns from endless synthetic filament yarns.

A false twist device which has been previously proposed includes two sets of rollers rotating in the same sense about parallel axes positioned so that the rollers of one set overlap the rollers of the other set to form cusps between adjacent overlapping rollers where the yarn passed generally parallel to the roller axes in contact with the roller peripheries. Such a construction failed to provide a satisfactory twisting action due to the difficulty of controlling the engagement of yarn in the cusps.

An object of the present invention is to provide an improved false twist device which overcomes the foregoing disadvantages and which moreover is especially suitable for incorporation in an apparatus for producing crimped yarn by heating and imparting false twist to a synthetic endless filament yarn.

According to the present invention a device for imparting twist to a textile yarn traversing the said device comprises a pair of rotated surfaces so located relative to one another as to form a cusp in which the yarn to be twisted is held by a third rotating surface, the location of the surfaces being such that the same degree and sense of twist is imparted to the yarn by all three surfaces.

Also according to the present invention a twisting device for textile yarns devised to apply a so-called false twist comprises two pairs of rollers the rollers of each pair being located relative to the other so as to form similar cusps, and a third roller located between said pairs, the dimensions and location of the said rollers being such that a yarn run between the cusps is deflected by the third roller from the straight line between the said cusps.

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

Fig. 1 is an end view of a preferred embodiment of false twisting unit;

Fig. 2 is a corresponding plan; and

Fig. 3 is a diagrammatic elevation of a crimping unit.

A false twisting arrangement for yarn comprises three rollers **11**, **12** and **13**. All these rollers rotate in the same direction and the yarn passes into the resultant twisting device via the cusp formed between the rollers **11** and **12**. All three rollers are contained within a supporting case **14** and are driven from a pulley **15** by means of a pulley **16**. The pulley **15** is carried on a short shaft passing through a bearing **17**, the other end of the shaft being provided with a driving pulley **18** which is rotated by a belt **19**. The latter belt may run the whole length of the machine and may serve a plurality of twisting heads of the type shown in the figures.

The drive to the roller **11** is via a pulley **20** and the drive to the roller **13** is via a pulley **21**. The pulley driving the roller **12** is immediately beneath the pulley **20**.

A yarn **22** passes through a guide eye **23** and thence, under slight tension, between rollers **11** and **12**, both of which act to rotate the yarn about its axis in the same direction, while the yarn traverses in an upward direction with reference to Fig. 1. After leaving contact with the said rollers, the yarn passes over the surface of roller **13**, this surface being displaced from the straight line of the yarn at its entry so that the yarn is held firmly against the gap or cusp between the rollers **11** and **12** and against the surface of the roller **13**. The surface of the latter is preferably rounded as shown to prevent damage to the yarn. Similarly, the corners of the surfaces of rollers **11** and **12** are also slightly rounded, and if necessary one or more of the surfaces of the said rollers may be composed of a resilient material such as rubber. Preferably, the surfaces of rollers **11** and **12** are of steel and a coating of resilient material having a high coefficient of friction, is applied to the surface of roller **13**.

After leaving the roller **13**, the yarn may pass directly through the exit eye **24**, but it has been found preferable in practice, to pass the yarn once more between two rollers **26** and **27** which rollers are of the same shape and size as the rollers **11** and **12**, the roller **26** being located on the same shaft as roller **11** and roller **27** being located on the same shaft as roller **12**, so that the peripheral speeds, of the said pairs of rollers, coincide. The rate of drive of all the rollers is such that the yarn receives an adequate degree of twist on one side of the twisting head, the said twist being removed at the other side of the head.

In a crimping unit as shown in Fig. 3, the yarn **22** is drawn by a delivery roller R from a yarn supply S through a tensioner T whereupon it is guided through or over a guide means, such as a guide eye G, as shown in the drawing, and is then drawn into contact with a heater H. After leaving the heater H, the yarn **22** passes through the guide eye **23** and thence into the false twisting device F.

It has been found that false twist arrangement enables a yarn such as, for example, one composed of monofilaments of nylon, to receive twist at an extremely high rate, preferably in excess of 50,000 r.p.m. while involving relatively low rotational speeds of all the rollers associated with the said twisting operation. In fact, it is possible to obtain the same degree of twist on the said yarn as is possible with present methods, with a considerably higher rate of transverse of the yarn through the apparatus. In addition, no high speed bearings are required, so that lubrication and driving problems are greatly simplified. A further advantage of the device is that since the rotational speeds of all the moving parts with the exception of the yarn are low, very little vibration and noise is occasioned.

The degree of divergence of the yarn from its original straight line produced by the roller **13** may, if required, be adjusted by altering the position of the centre of rotation of the shaft driving roller **13** relative to the positions of the other two driving shafts supporting rollers **11** and **12**. The amount of divergence must however be sufficient in conjunction with the yarn tension employed, to cause adequate twisting effect to be imparted to the yarn.

The axial distance between adjacent faces of the rollers **11**, **12** and **26**, **27** is preferably made small so that the yarn has no tendency to become trapped between the said pairs of rollers. The distance between the faces of rollers **12**, **26** and **13** can also be made smaller, though this is not thought to be essential.

It will be understood that the rollers may be mounted on shafts, or they may be manufactured so that each shaft and its rollers are formed from a single piece of material. Again, the rollers may be solid, with parallel

sides, or they may be provided with webs which are thinner than the surface flanges in order to obtain lightness.

I claim:

1. A device for imparting false twist to a textile yarn comprising in combination two rollers rotating in the same sense about parallel axes positioned so that the two rollers overlap to form a cusp where the yarn passes generally parallel to the roller axes in contact with both roller peripheries, a third roller also rotating in the same sense about an axis parallel to the said axis pressing the yarn into the said cusp, a fourth roller rotating coaxially with one of the said first two rollers and a fifth roller rotating coaxially with the other of the said first two rollers, said fourth and fifth rollers being positioned so that they overlap to form a second cusp, said third roller deflecting the yarn from a straight line between the cusp of the first two rollers and the cusp of the fourth and fifth rollers.

2. A twisting device for textile yarns devised to apply a so-called false twist comprising in combination two pairs of rollers, the rollers of each pair being located relative to the other so as to form similar cusps, and a third roller located between said pairs of rollers, the dimensions and location of the said rollers being such that a yarn run between the cusps is deflected by the third roller from the straight line between the said cusps.

3. A false twist device for use with a yarn crimping apparatus including a yarn tensioner through which endless synthetic filament yarn passes from a yarn supply, a heater, means for guiding yarn from said tensioner past said heater, means for guiding the yarn from the heater to the false twist device and means for delivering yarn and drawing it from the tensioner through the heater and false twist device, the false twist device comprising in combination two rollers rotating in the same sense about parallel axes positioned so that the two rollers overlap to form a cusp where the yarn passes generally parallel to the roller axes in contact with both roller peripheries, a third roller also rotating in the same sense about an axis parallel to the said axes pressing the yarn into the said cusp, a fourth roller rotating coaxially with one of the said first two rollers and a fifth roller rotating coaxially with the other of the said first two rollers, said fourth and fifth rollers being positioned so that they overlap to form a second cusp, said third roller deflecting the yarn from a straight line between the cusp of the first two rollers and the cusp of the fourth and fifth rollers.

References Cited in the file of this patent

UNITED STATES PATENTS

113,831	Archibald	Apr. 18, 1871
828,121	Kaiser	Aug. 7, 1906
1,030,179	Hilden	June 18, 1912
2,522,332	Abbott	Sept. 12, 1950
2,761,272	Vandamme et al.	Sept. 4, 1956