Oct. 14, 1958 J. ESHUIS 2,855,749

YARN TENSIONING

Filed Dec. 22, 1955 2 Sheets-Sheet 1

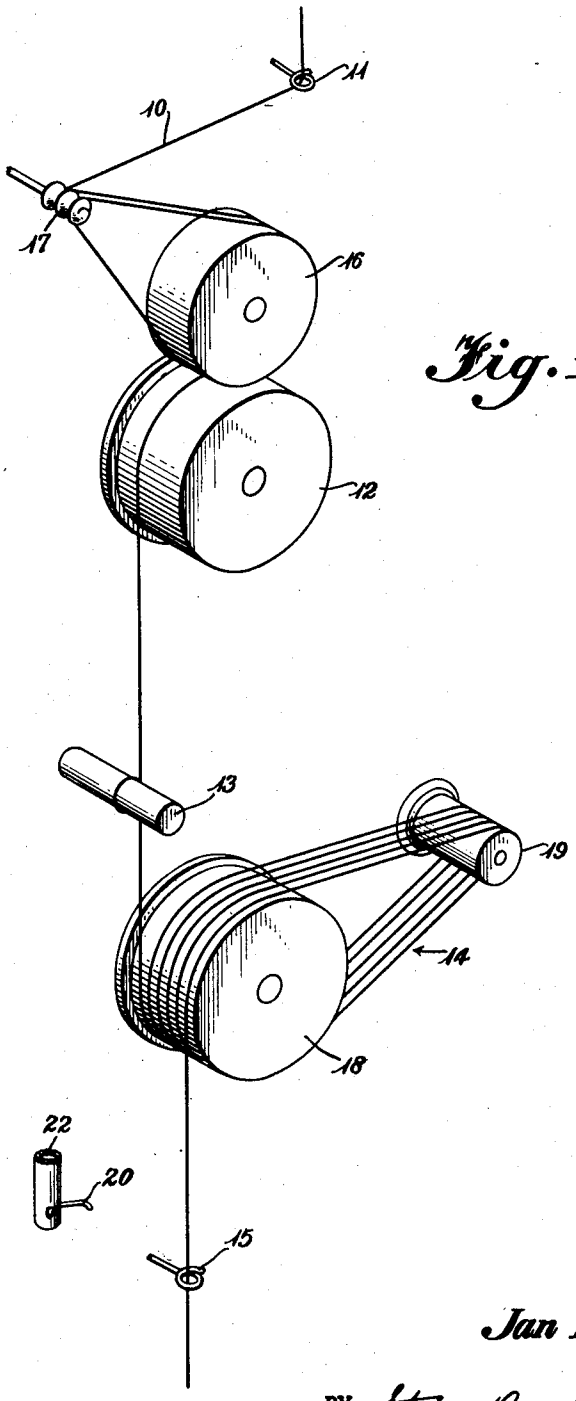


Fig. 1.

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Fig. 2.

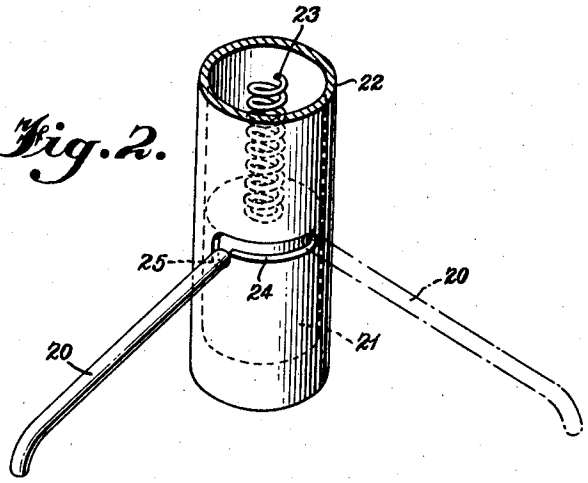


Fig. 3.

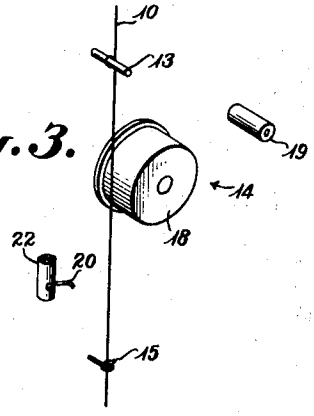


Fig. 4.

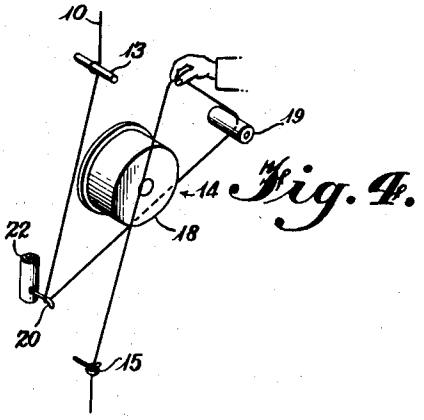


Fig. 5.

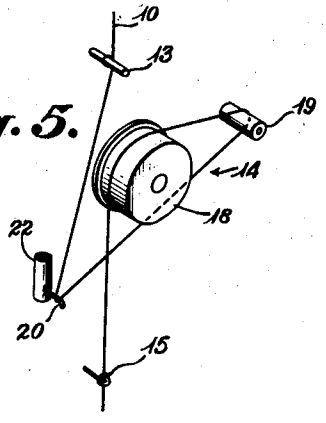
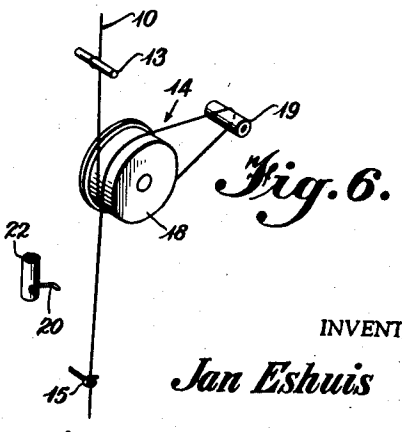


Fig. 6.



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United States Patent Office 2,855,749 Patented Oct. 14, 1958

2,855,749

YARN TENSIONING

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Application December 22, 1955, Serial No. 554,893

Claims priority, application Netherlands January 7, 1955

7 Claims. (Cl. 57—55.5)

This invention relates to the stretching of running threads or yarns and more particularly to an improved arrangement for threading in when stretching as, for example, in draw twisting.

In the draw twisting of yarns such as nylon a running yarn is stretched between two rollers operated at a difference in peripheral speed and the stretched yarn is then led to the twisting spindle. In the case of high denier, high strength yarns, the threading of the draw godet is very dangerous since the tension and strength of the yarns is ample to bring about amputation of the operator's fingers. For this reason it has been customary to use machines for threading the draw godet, one example of such a machine being shown in the patent to Lichtenberg, Patent No. 2,491,569.

In the Lichtenberg patent the yarn is first wound around a ring which surrounds the draw godet. The ring is then axially displaced and the yarn loops fall onto the godet for propulsion thereby. While this arrangement provides adequate operator safety, the shifting of the ring introduces an added step to the process.

It is an object of the present invention to simplify the threading of draw devices whereby the threading in can be quickly and conveniently accomplished without hazard to the operator.

Other objects and advantages of this invention will be apparent upon consideration of a preferred embodiment thereof in conjunction with the annexed drawings wherein:

Figure 1 is a schematic perspective view of apparatus employed in the draw twisting of nylon, the improvement of the present invention being shown in the position assumed thereby after the threading is complete;

Figure 2 is a perspective view on an enlarged scale of the improvement of the present invention showing it in the position which it assumes during threading in; and

Figures 3, 4, 5 and 6 illustrate successive steps of threading in a godet according to the teachings and the principles of the present invention.

Referring now in detail to Figure 1, the numeral **10** designates a high strength nylon yarn which is being stretched prior to twisting. The yarn is led through a pigtail guide **11** to a feeding roller **12**, around a draw pin **13**, around a godet **14** and through a pigtail guide **15** to the twister, not shown. The feeding roller **12** delivers the yarn to the draw pin **13** and, to prevent slippage, a pressure roller **16** rides in peripheral contact with the delivery or feeding roller **12**. A helically shaped yarn guide **17** is located between the pigtail guide **11** and the pressure roller **16** in order that the yarn may be wrapped several turns around the pressure roller **16** without having the consecutive coils in contact with one another. Spacing of the yarn on the draw godet is accomplished in the conventional manner by the use of spaced cylinders **18** and **19** having axes slightly askew in order to cause the successive coils of yarn wound therearound to follow a helical path. The cylinder **18** is positively driven and the cylinder **19** is freely rotatable.

In Figure 1, it will be recognized that the yarn is shown in the running condition after the draw device has been threaded up. It will also be recognized that the peripheral speed of the cylinder **18** is in excess of that of the roller **12** so that stretch occurs between these two rollers around the draw pin **13**, as is conventional in this art. In view of the strength of nylon, which is considerable, and the heavy tension imposed thereon, it will be appreciated that the pressure of the coils of the yarn **10** around the godet **14** is quite high. Accordingly, the threading up of this godet is a dangerous operation, the safety of which is considerably enhanced by the present invention. According to the present invention, there is provided adjacent to the godet **14** an auxiliary yarn guide arm **20** in the form of a little hook which is mounted to swing from the yarn releasing position shown in Figure 1 to the yarn engaging position shown in Figure 2.

The guide arm or hook **20** is pivotally mounted on a cylinder **21** which is mounted for rotation in a tube or sleeve **22**. Within the sleeve or tube **22** there is located a coil spring **23** which acts to bias the cylinder **21** downwardly as it appears in Figure 2. The sleeve **22** is, of course, provided with a cap which is omitted in the patent drawings for convenience of illustration. It is to be understood that the spring **23** runs between the cap, not shown, and the top of the cylinder **21** in compression so that it exerts a downward force on the cylinder **21** but does not impose a torque thereon tending to rotate it about its axis. A slot at **24** is cut in the sleeve **22** and this slot extends for about 90° and is provided with an axially extending notch at **25** which will receive the arm **20** and hold the same against rotation. The slot at **24** extends in such a way that when the arm **20** is in the position that has been drawn in full lines, it extends approximately parallel to the axis of the stretching cylinder **18** whereas, upon being brought into the other end of the slot it crosses said axis at approximately right angles and points to the stretching cylinder **18**. This latter position is shown in broken lines. When the arm is in the full line position of Figure 2, it is biased into the notch by the thrust of the spring acting on the cylinder **21** from which the arm **20** projects. Thus rotation of the arm **20** from the full to the broken line positions is resisted to a degree determined by the contours of notch **25** and the thrust of the spring **23**. This resistance is so chosen that it can be overcome by the tensioning effect of the godet **14** when it is drawing yarn from the pin **13**.

With the assembly of the guide arm **20** in full line position, a typical threading in operation can be described. Reference is first made to Figures 1 and 3. The yarn **10** is in an untensioned condition wrapped around the rollers **12** and **16** and the yarn guide **17** as well as the draw pin **13** in the manner shown in Figure 1. The yarn is then led straight from the draw pin **13** through the pigtail guide **15**. Since the roller **12** is delivering the yarn at a speed compatible with the spinning speed, the yarn is not tensioned and these operations can be performed without danger to the operator. With the yarn running in the Figure 3 position, the operator pulls a loop between the draw pin **13** and the guide **15** and passes this loop under the arm **20** and around the idler cylinder **19** of the godet **14**, see Figure 4. The arm **20** is, under these circumstances, latched in the full line position of Figure 2. The operator lets go of the yarn after he has passed it over the top of the driven cylinder **18** and when he does let go the yarn assumes the path shown in Figure 5. The operation of the cylinder **18** causes tensioning of the yarn enough to overcome the action of spring **23** so that the arm **20** is moved to the broken line position of Figure 2 and causes the loop to be complete on the cylinder **18**, see Figure 6. The use of the swing-

able auxiliary yarn guiding arm **20** positively prevents the yarn from wrapping itself around the stretching cylinder **18** of the godet **14** during threading in. This difficulty could otherwise arise due to the fact that at the moment when the stretching starts the yarn speed suddenly increases considerably whereas the collecting speed of a twisting bobbin arranged after the stretching device adapts itself only slowly to the new yarn speed. As soon as the collecting speed has adapted itself, the stringing of the following yarn windings on the stretching roller without the use of auxiliary yarn guide does not present any further difficulties.

In the embodiment according to the figures only one swingable yarn guide is provided, but in other embodiments of the stretching device it may be useful to have more of these swingable auxiliary yarn guides. Further it is possible to swing away the auxiliary yarn guide(s) by exercising by hand an increased pull on the yarn which has been strung on the yarn guides and which is not yet in contact with the stretching cylinder, which procedure should be considered for example in case a yarn is entirely kept out of contact with the stretching cylinder by the auxiliary yarn guides. In the latter case the yarn could be strung at once with more than one loop around the stretching cylinder.

What is claimed is:

1. In apparatus for tensioning yarn that includes means presenting a yarn drawing surface rotatable about an axis, the improvement that comprises a yarn guiding arm adjacent to said means, means at one end of said arm mounting the same for movement from a first position generally parallel to said axis to a second position generally normal to said axis with the free end of said arm closer to said surface, and means releasably, resiliently latching said arm in said first position with a force less than the component acting on the arm when yarn is drawn to said surface over said arm.

2. In apparatus for tensioning yarn that includes a yarn drawing godet comprising a driven cylinder and an idler cylinder the improvement that comprises a yarn guiding arm, means mounting said arm from one of its ends for arcuate movement from a first yarn engaging position substantially parallel to the axis of said godet to a second yarn releasing position with the free end of said arm nearer to and pointing toward said godet, and means for releasably holding said arm in said first position against a predetermined thrust tending to move said arm to said second position.

3. In apparatus for tensioning yarn that includes a yarn drawing godet comprising a driven cylinder and an idler cylinder, the improvement that comprises a yarn guiding arm, means mounting said arm from one of its ends for arcuate movement from a first position substantially parallel to the axis of said godet to a second position with the free end of said arm nearer to and pointing toward said godet, the yarn guiding surface of said arm in said first position and the yarn receiving surface of said idler cylinder lying in alignment on opposite sides of said driven cylinder to define a yarn path extending from one side of said driven cylinder to the other but out of contact with the same, and means for releasably holding said arm in said first position against a predetermined thrust tending to move it to said second position.

4. In apparatus for tensioning yarn that includes a yarn drawing godet comprising a driven cylinder and an idler cylinder arranged substantially parallel to one another, means defining a yarn path adjacent to said driven cylinder on the side thereof opposite to said idler cylinder, a swingable yarn guide adjacent to said yarn path and on the same side of said driven cylinder, a straight line between said yarn guide and said idler cylinder bypassing said driven cylinder, and means releasably, resiliently latching said arm against swinging movement to release said yarn.

5. A self-releasing yarn guide for use in threading in draw twisters comprising an arm, means pivotally mounting said arm at one end only thereof for angular movement between a yarn engaging position and a yarn releasing position about an axis generally normal to the plane of movement of the arm, and means releasably, resiliently holding said arm in said yarn engaging position.

6. A self-releasing yarn guide for use in threading in draw twisters comprising a cylinder, a sleeve mounting the cylinder for rotation, said sleeve having a slot therein extending for about 90°, an arm having one end anchored in said cylinder and projecting through said slot, said slot having a notch therein at one end, a spring bearing on said cylinder in a direction to bias said arm into said notch.

7. The method of threading a draw off godet including driven and idle cylinders located between a draw pin and a guide that comprises pulling a loop in the yarn running between said pin and guide in a direction away from said driven cylinder, temporarily holding said loop while drawing a second loop between said held point and said idle cylinder on the other side of said driven cylinder, and then passing the second drawn loop over said driven cylinder while releasing said temporary hold upon achievement of a predetermined yarn tension.

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