Feb. 12, 1963 J. S. SENEY 3,077,313

YARN GUIDE AND STRING-UP APPARATUS

Filed June 28, 1960

FIG. 1

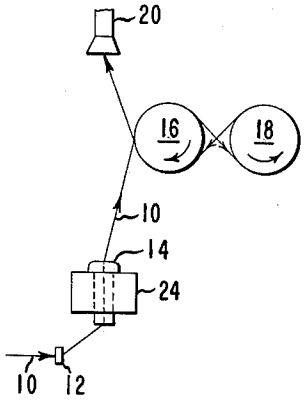


FIG. 2

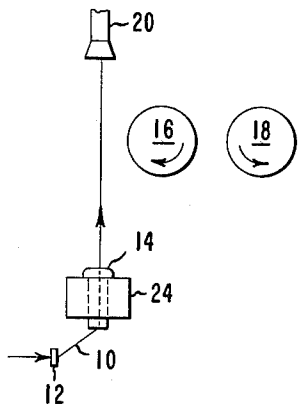
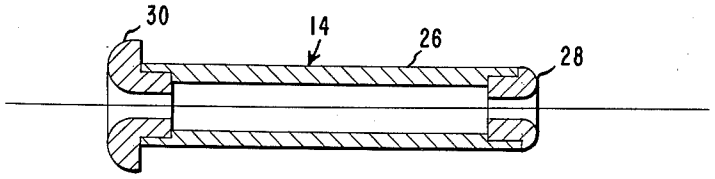


FIG. 3



INVENTOR
JOHN SEYMOUR SENEY

BY Harry C. Braddock
ATTORNEY

United States Patent Office 3,077,313 Patented Feb. 12, 1963

3,077,313

YARN GUIDE AND STRING-UP APPARATUS

John Seymour Seney, Seaford, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Filed June 28, 1960, Ser. No. 39,379
9 Claims. (Cl. 242—47.09)

This invention relates to the heat-treating and drying of moving yarns and particularly to a novel device for positioning a moving yarn line around the hot rolls used in such a process.

Yarn is used to designate any artificial or natural monofilament, multifilament, spun staple yarn, or the like.

The positioning or stringing up of a plurality of turns fast-moving yarn over and around a plurality of heated high speed rotating rolls is a hazardous and intricate operation. The operator normally manipulates a pair of sticks to perform this operation with the danger of harming himself or the equipment if the sticks should catch in the moving thread. While the remainder of the system can be strung-up at low speed or with the machine stopped, yarn should not be put on the hot rolls unless the yarn is moving at the normal machine speed. Otherwise the yarn will be damaged by excessive heat transfer. In particular, with synthetic yarns the yarn will soften and melt and stick to the rolls.

A principal object of this invention is to provide a safe method and apparatus for effectively stringing up moving yarn on continuous-type heating or drying rolls while the machines are in operation.

Another object of this invention is to provide a simple, reliable, and economical improved arrangement for stringing up yarn around the ends of continuous rotating shaft or shafts.

Other objects of this invention will become apparent when considered with the descriptions as illustrated by the accompanying drawings.

In general, the objects of this invention are accomplished by providing a combined guide and yarn string-up assembly which normally is maintained in a fixed position but which can be moved manually and used to guide the moving yarn around the ends of rotating rolls. The method of string-up around the ends of rotating hot rolls consists of threading yarn through the guide, initially bypassing the rotating rolls, feeding the yarn through the remainder of the system, bringing the system up to running speed, removing the guide from its holder, and using it as a tool to stringup the yarn around the rolls, and replacing the guide in its holder for its normal guiding operation.

The combination guide and string-up tool will be explained more fully in the specification which follows, reference being had to the accompanying drawings, wherein:

FIGURE 1 is a schematic diagram of a portion of yarn treating system embodying features of this invention in which the yarn being heated on the rolls is in position around the rolls, i.e. "completely string up."

FIGURE 2 is a view of the same portion of the system of FIGURE 1 in which the yarn is shown partially in position or strung up; and

FIGURE 3 is a longitudinal cross sectional view of the combination hand tool and guide device of the present invention.

FIGURE 1 shows the yarn position and path of movement under normal operating conditions. Yarn 10 enters the hot roll section of the system through a stationary guide 12, through the combination guide and string-up tool 14, around rotating rolls 16 and 18 in figure 8 configuration. The number of turns around these

rolls depends upon the process conditions; ranging from one to a number of wraps around such rolls; and the yarn finally passes to an exhaust system 20 which carries the yarn to other parts of this process. Rolls 16 and 18 are heated by means not shown which can be either internally or externally radiant heaters. The location of guide 14 and exhaust system 20 determine the actual location of the wraps around hot rolls 16 and 18.

FIGURE 2 shows the system with the yarn partially strung up. The yarn is passed through guide 12 and then through the combination guide and string-up tool 14 and directed to the yarn removal device 20. During initial starting windup when the system is strung up by hand the temperature of the hot rolls is such that the yarn must be moving when it is in contact with the hot rolls 16 and 18. If the yarn remains in contact with the rolls, particularly with synthetic yarns, there is a tendency to soften and melt and stick to the rolls. Consequently, the yarn removal device, and the mechanism beyond that, is strung up at low speed. After the string-up is complete, except for the hot rolls, the machine is brought up to operating speed. At that time, the yarn passes as shown in FIGURE 2 with yarn 10 now moving at a high linear speed. The operator removes the combination guide and string-up tool 14 from its holder 24. The string-up tool 14 is of such a size that it will easily fit into the hand of the operator. The operator then takes the hand tool 14 and directs the moving yarn, first under moving roll 16, then over roll 18, around and under roll 18, and finally over roll 16. He makes the necessary number of wraps and then he places the string-up tool in its holder 24 such that it now functions as a guide and positions the yarn 10 as it enters onto heated roll 16.

FIGURE 3 shows one embodiment of this combination guide and string-up tool 14. The assembly consists of an elongated tubular structure 26, preferably made of some suitable material such as aluminum, and two eyelet guide elements 28 and 30, usually made from a suitable wear resistant material. The assembly is made, for example, by forming the tube 26 appropriately at the ends so that the eyelet guides 28 and 30 are frictionally secured in tube 26. Eyelet 28 has the same outside diameter as tube 26 so that it can easily be inserted into the tool holder structure 24. Eyelet 30 has a radial projection so that tool 14 does not slide through the holder structure 24. The assembly is of such a size and weight as to be easily grasped and manipulated by one hand.

By my invention, I have provided a very simple, reliable, and safe arrangement for positioning a running yarn line around one or more rolls with a minimum of time and effort. In addition to serving as a stationary guide for the moving yarn after string-up the novel assembly is ready for instant operation as desired.

While the precise construction hereinbefore described is preferred, it is understood that the construction of this combination guide and string-up tool 14 can be modified in a number of ways. Another embodiment may be to have the eyelet guides inserted in such a manner that they are held in either by set screws or appropriate cement. Other modifications within the spirit of this invention will become apparent from the foregoing detailed description and the invention is to be limited only to the extent indicated in the following patent claims.

I claim:

1. An apparatus for handling a moving textile yarn line, said apparatus comprising an incoming yarn line receiving and guiding means at a first position, and an outgoing yarn line receiving and guiding means at a sec-

ond position and at least one moving yarn line treatment device positioned in said apparatus; and a single manually freely movable and detachable integral unitary annular auxiliary yarn guiding and manipulating unit having an elongated handgrip structure thereon and cooperating with one of said means and constructed and arranged to continuously receive, engage, completely surround and guide a moving yarn line while freely manipulated or freely manually moved in any direction to displace the moving yarn line as desired in said apparatus into and out of operative engagement with the yarn treatment device.

2. An improved textile yarn handling apparatus comprising a supporting frame structure, at least one yarn engaging device mounted in said frame structure for performing useful work on a running yarn line, an incoming yarn guiding means supported in said frame structure at a first position for receiving a running yarn line and directing it to said yarn engaging device during operation of said apparatus, an outgoing yarn engaging and guiding means mounted at a second position in said frame structure for receiving a running yarn line from said yarn engaging device and directing it from said apparatus to a subsequent operation, one of said yarn guiding means consisting of a stationary yarn guiding element and a single easily detachable unitary and annular movable integral yarn guiding element cooperating therewith, said movable yarn guiding element provided with an elongated handgrip portion and constructed and arranged for unrestrained manipulation in any direction simultaneously with its operation in guiding a running yarn line so that a running yarn line initially passing from said first position to said second position can be displaced into operative engagement with said yarn engaging device to commence its work operation on the yarn after the yarn line has commenced its running movement.

3. In combination with an apparatus for treating running filamentary material, a single unitary integral freely movable annular guide means for continuous engagement with the running filamentary material, said movable guide means consisting of an elongated handgrip portion positioned and arranged for convenient unlimited manipulation of said guide means with respect to said apparatus and for simultaneously completely surrounding and guiding the running filamentary material in order to position the path of the running filamentary material as desired with respect to said apparatus, and a means for supporting said guide means on said apparatus in a given stationary filamentary material guiding position.

4. A textile yarn handling apparatus comprising at least one yarn engaging unit for performing useful work on a running yarn line and yarn guide means constructed and arranged to surround and contact a running yarn line and to lead, and guide the same to and from said yarn engaging unit, said yarn guide means comprising a manually freely movable integral unitary annular guide portion completely surrounding the running yarn line to simultaneously contain and guide the running yarn line while permitting unrestricted displacement of the yarn line as desired in varying positions about the apparatus to engage and disengage the running yarn line and said yarn engaging unit.

5. A textile yarn treating apparatus comprising a supporting frame structure, at least one rotary yarn engaging member mounted in said structure, yarn guide means constructed and arranged to engage and completely surround a running yarn length and to guide the same to and from at least one rotary yarn engaging member in the apparatus, said yarn guide means comprising a manually freely movable yarn manipulating unit, said unit consisting of an elongated handgrip portion and a unitary, annular integral yarn guiding portion surrounding the running yarn line to permit continuous engagement and guiding of the running yarn line while simultaneously freely manipulating said unit in three dimensions and displacing the running yarn line into and out of engagement with said rotary yarn engaging member.

6. The apparatus of claim 5 in which the movable yarn manipulating unit further comprises an elongated hollow cylindrical handgrip of continuous transverse cross-section having at each end thereof an aligned annular wear resistance yarn guiding element.

7. The apparatus of claim 6 in which is provided a means for supporting said movable yarn manipulating unit in a given position in said frame structure.

8. A textile yarn treatment apparatus comprising a supporting frame structure, a plurality of heated driven elongated cylindrical yarn engaging members each rotatably mounted at one end thereof in said frame structure with the axis operatively aligned with the other members, a first guide means mounted in said structure for receiving an incoming running yarn length and guiding the same within said structure, a second guide means mounted in said structure for receiving an outgoing running yarn length and guiding it away from said apparatus, one of said guide means comprising a first stationary guide portion and a second unitary solid integral freely movable guide portion easily detachable from said first portion, said second portion constructed and arranged to continuously engage and completely surround and guide a running yarn length passing through said apparatus and comprising a handgrip portion to permit unrestricted manipulation of said second portion with respect to said structure so that a plurality of turns of a running yarn length may be moved into operative engagement around each of said members.

9. An improved tool for stringing up a textile yarn treatment apparatus comprising a supporting frame, a plurality of aligned heated driven rotary roll elements for engagement with a running yarn line each mounted at one end thereof in said frame, guide means in said frame cooperating with a running yarn line to guide the same to and from said roll elements, by positioning a plurality of turns of the moving yarn line around each of said roll elements in a predetermined pattern, said tool comprising a single unitary integral freely manually movable annular yarn guide means engaged and completely physically surrounding the running yarn line, said movable guide means provided with an elongated cylindrical handgrip portion for unrestricted manual manipulation of the running yarn line with respect to said heated roll elements to position the turns of the moving yarn line around rotating roll elements in the predetermined pattern said hand grip portion constructed and arranged to completely physically surround the running yarn line.

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