

May 11, 1954

J. A. DIXON

2,677,949

THREAD WIPER-GUIDE FOR USE IN THREAD-SPINNING APPARATUS

Filed April 28, 1951

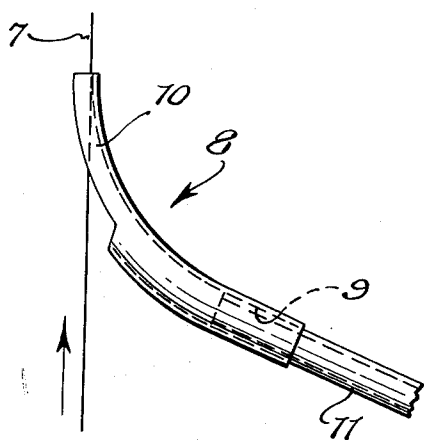


Fig. 1.

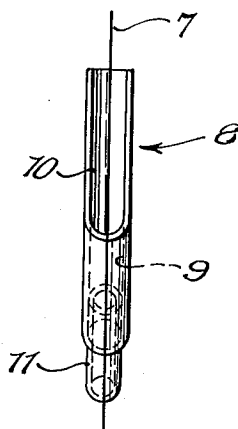


Fig. 2.

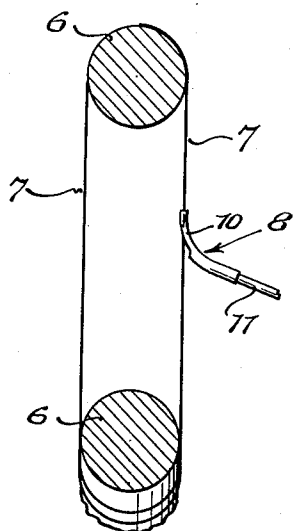


Fig. 3.

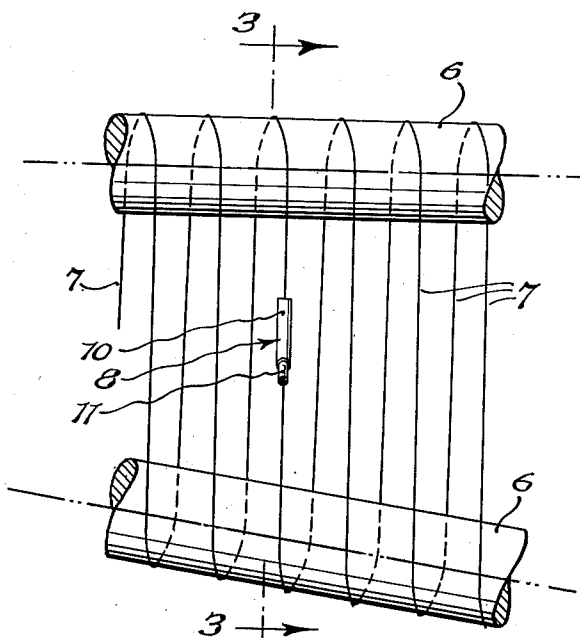


Fig. 4.

INVENTOR.
Julian A. Dixon
BY
Thomas E. Tate
Agent.

UNITED STATES PATENT OFFICE

2,677,949

THREAD WIPER-GUIDE FOR USE IN
THREAD-SPINNING APPARATUS

Julian A. Dixon, Hawkesbury, Ontario, Canada,
assignor to Canadian International Paper Com-
pany, Montreal, Quebec, Canada, a corporation
of Quebec

Application April 28, 1951, Serial No. 223,505

1 Claim. (Cl. 68—19)

1

This invention relates to new and useful improvements in apparatus usable in connection with wet spinning methods of producing synthetic threads and particularly seeks to provide a novel thread wiper and guide.

When manufacturing synthetic threads, for instance, high tenacity rayon for use in rubber tires, according to the wet continuous spinning process, the spinning solution, for example, viscose, is extruded through a spinneret into a coagulating bath. The coagulated and partly regenerated thread is withdrawn from this coagulating bath and is stretched, washed, finished, dried and wound onto bobbins by any of a number of different methods well known to those familiar with the art.

In one such method the thread is led by a suitable arrangement of guides to a godet. From this godet the thread goes to a second godet running at a greater peripheral speed than the first, thus imparting stretch to the yarn. By any suitable means the thread is treated between these two godets with liquid, for example, hot water or, even better, hot dilute sulphuric acid in order to facilitate this stretching operation.

For subsequent treatment of the thread there are a variety of methods possible and many employ one or more of some type of thread-storing, thread-advancing reel. This particular invention is particularly helpful when a single such reel is used on which all of the various treatments of washing, finishing and also drying are carried out. Of course, it will be obvious from a description of the invention that it could gainfully be used in a system employing more than one such reel.

Considering the case where one such thread-advancing reel is used, the construction of this reel can be of a variety of types. For instance, such reels generally consist of a pair or plurality of individual rotating rolls having their axes slightly out of parallelism in order to advance the thread. This invention, however, is not meant to be restricted to any particular design of reel. It is well known in the art that when employing a reel of the above-mentioned type considerable difficulties are encountered in attempting to wash, finish and dry the thread all on one reel. In particular, with heavy denier threads such as 1100 or 1650 deniers which are used for the manufacture of rayon tire cords, the reel has to be of considerable length to insure adequate washing and other treatments but, more particularly, for sufficient drying of the thread.

One of the main reasons for drying difficulties

2

is the fact that any such reel never runs exactly true, there always being some vibratory motion. This motion causes, among other things, lateral creeping of the yarn on the reel over and above the movement imparted due to the misalignment of the reel axes. In a fairly long reel, which is necessary for adequate treatment and drying space, this creeping movement builds up and at times reaches such a magnitude as to cause the threads to cross over. When spinning heavy deniers at high speeds this crossing over of the threads can prevent them from being fully dried unless an objectionably long reel is used.

It is therefore an object of this invention to provide a novel thread wiper-guide usable in connection with the thread-storing, thread-advancing reel of synthetic thread-spinning equipment.

Another object of this invention is to provide a thread wiper-guide so constructed that its use in connection with a thread-storing, thread-advancing reel being operated at relatively high speeds will eliminate creeping or crossing of the thread wraps while effectively removing free surface liquid therefrom.

A further object of this invention is to provide a device of the character stated that is fabricated from a relatively flexible elastomer and comprises a tubular mounting portion having extending from one end a finger-like projection of arcuate cross-section.

A further object of this invention is to provide a device of the character stated in which the arcuately cross-sectioned projection is sufficiently flexible to partially wrap around the engaged thread for proper wiping action and sufficiently inflexible to effect the desired guiding control over movement of the thread without undue frictional drag.

With these and other objects in view, the nature of which will be more apparent, the invention will be more fully understood by reference to the drawings, the accompanying detailed description and the appended claim.

In the drawings,

Fig. 1 is a side elevation of a thread wiper-guide constructed in accordance with this invention;

Fig. 2 is an end elevation thereof;

Fig. 3 is a longitudinal section taken along line 3—3 of Fig. 4; and

Fig. 4 is a somewhat schematic top view of the thread wiper-guide in use.

Referring to the drawings in detail, this invention as illustrated is embodied in a thread wiper-guide to remove liquid from, and maintain the

relative positions of, successive wraps of thread moving on a thread-storing, thread advancing reel.

A thread-storing, thread advancing reel consists of a pair of individually rotating rolls 6, 6 mounted with axes slightly out of parallelism to advance the thread 7 which makes a plurality of spaced windings along the length of the reel. Although somewhat distorted in the interest of clarity of illustration, in actual practice the pitch of the windings is such that the spacing between the threads is $\frac{1}{8}$ to $\frac{1}{4}$ inch.

A thread wiper-guide 8 is mounted on a suitable support (not shown) and positioned at any desired point in frictional contact with the thread 7. The guide is made from flexible tubular material, the mounting or base end being a tube with a bore 9 and the remainder comprising an arcuately cross-sectioned projection 10 formed by cutting away a portion of the tube, the outer end being curved upward along the longitudinal axis. The outer end of the projection 10 makes contact with the thread to effect the desired wiping action and to prevent creeping of the thread on the reel. The guide may be connected by means of a tube 11 through the bore 9 to any suitable liquid-holding device (not shown) if desired.

Any suitable flexible tubular material may be used for making the thread wiper-guide but the choice is generally governed by durability, economy, availability and, most important, the proper degree of flexibility. If the guide is too rigid the thread will be damaged and also will slip out of the arcuate portion. If, on the other hand, the guide is too limp it will have no dampening effect on the thread. Flexibility depends largely on the material used and the free, unsupported length of the guide. Therefore, these two factors must be considered in making a thread wiper-guide.

Generally the elastomers will have the most desirable qualities as a material but other flexible materials are not precluded. It is to be understood also that the denier of the yarn, tension of the winding, and other variables affect the desired flexibility.

The fact that the wiping portion is arcuate is also important. Such a shape enhances at least two specific actions. First, a more efficient removal of liquid from the thread is effected due to the area contact of the inner arcuate surface with the thread instead of a straight-line contact and secondly, due to its flexibility, the guide wraps around the thread and minimizes any scratching or scuffing caused by friction because the frictional drag is distributed over a greater area.

The following will illustrate the value of a thread wiper guide constructed in accordance with this invention when used in connection with one type of rayon spinning apparatus:

A 1650 denier, 720 filament viscose rayon yarn was produced according to the conventional method and washed, finished and dried on a single thread-storing, thread advancing reel. Without the novel guide described above thread movement when spinning at 80 metres per minute was so

great as to make the thread cross over during passage over the drying section, and it was accordingly impossible to dry the thread sufficiently. Without changing any of the conditions except the mounting of the above described guide at a point just prior to where the yarn entered the drying portion of the reel, the yarn was able to be dried sufficiently because of the dampening effect of this guide on the lateral creeping movement of the yarn and the removal of liquid. It should be pointed out that this creeping movement generally starts in the wet section of the reel and by placing this guide between the wet and dry sections the creeping movement during the passage over the latter section was drastically reduced. When a longer thread-storing, thread-advancing reel is being used it may be found desirable to use two or more thread wiper-guides.

It is known in the art that better quality yarn is made if the thread is led to the finishing reel under as small a tension as possible. Unfortunately, with low tensions at this point the tendency for lateral creeping movement of the thread on the reel is increased. By the use of this guide it has been found possible to go to much lower tensions than have heretofore been found possible and to cut down on this movement sufficiently to permit the yarn to be adequately dried and hence to obtain the benefits of this lower tension.

Thus it will be seen that the invention herein disclosed provides a thread wiper-guide capable of greatly increasing the efficiency of a thread-storing, thread-advancing reel.

It is, of course, to be understood that various details of arrangement and proportions of parts may be modified within the scope of the appended claim.

I claim:

In combination with a thread-storing, thread-advancing reel adapted to carry a plurality of windings of thread to be treated, a thread wiper-guide assembly consisting of an upwardly extending mounting-draining tube aligned with a thread on said reel and a thread wiper-guide formed from an elastomer and including a tubular mounting portion connected at its lower end to the upper end of said mounting-draining tube and provided at its upper end with an upwardly curved extension of arcuate cross-section adapted to be engaged with that strand of thread carried by said reel in alignment with said mounting-draining tube, said upwardly curved extension being sufficiently flexible to provide effective wiping of free surface liquid from the thread engaged thereby but sufficiently rigid to dampen lateral creeping movement of said thread along the length of the associated reel.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,935,787	Zapf	Nov. 21, 1933
2,539,980	Van Hall et al.	Jan. 30, 1951