

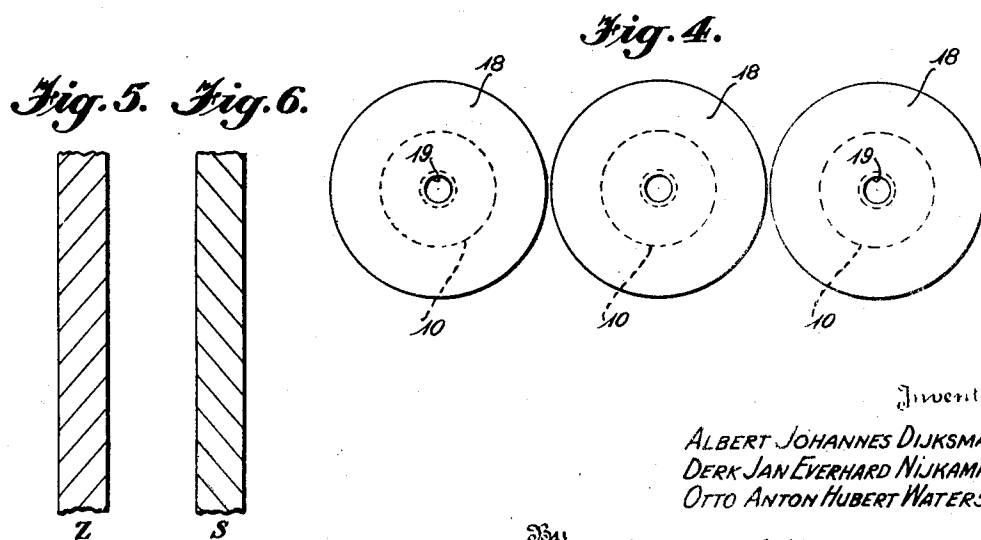
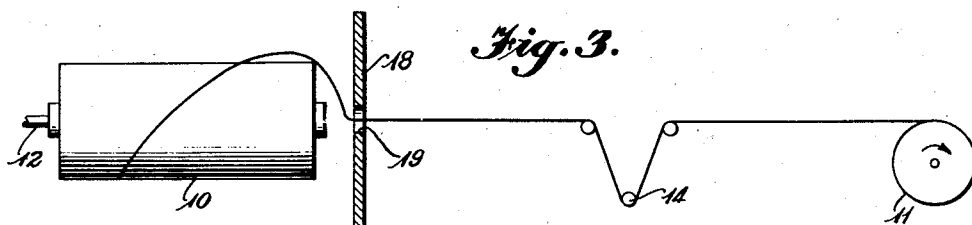
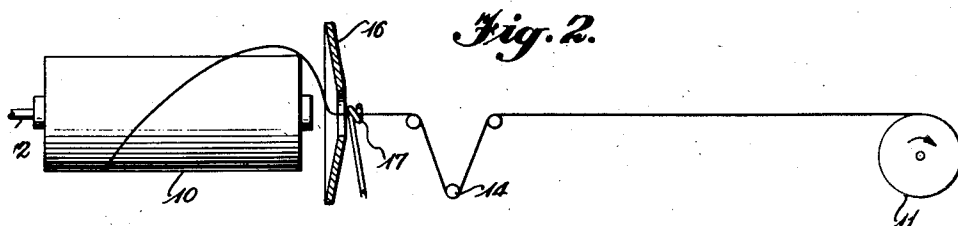
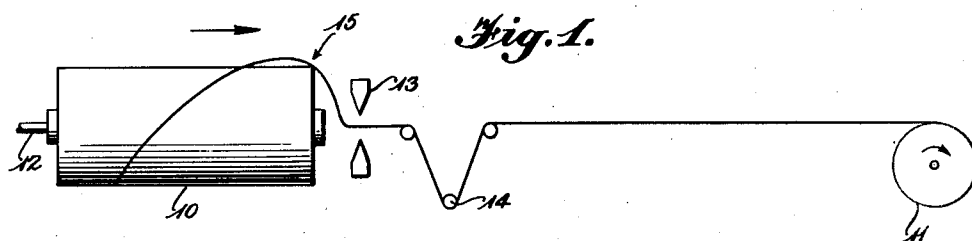
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WINDING CREPE THREAD

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WINDING CREPE THREAD

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1

This invention relates to the preparation of warp and is more particularly concerned with the high speed preparation of warp from high twist crepe threads.

In warping operations it is customary to support a large number of spools of thread on a creel and to draw the thread overhead from these spools to a beam on which the threads are wound in parallel relationship. During the passage of the threads from the spools to the beam, their path of travel and tension is very accurately controlled by the use of brakes, guides, reeds and the like so that the warp produced will be of high quality and so that the creeling speed may be maintained as high as several hundred meters per minute.

Conventional warping arrangements, as described above, are very efficient in most instances but have been found to be highly unsatisfactory in the warping of crepe due to the fact that crepe thread, if taken off a stationary spool in an overhead manner, tends to form loops and wrinkles that cannot be corrected by conventional creeling brakes, and that are often aggravated thereby. In some cases loops and wrinkles are actually formed by the brakes themselves because a twist is pushed up by the brake.

In an effort to overcome the foregoing problem, it has been proposed to combine a brake with a thread guide so that wrinkles that are formed incident to overhead draw off can be removed before the thread reaches the beam. However, owing to the relatively large distance between the wound bobbin of the thread guide and brake assembly, there is a tendency, when the beam is stopped for any reason, for the threads to contact with threads from neighboring bobbins being led to the beam, causing entanglements and other difficulties.

In view of the foregoing, sometimes the warping of crepe threads has been effected by employing rotatably mounted flanged spools for supporting the thread on the creel, the spool being unwound tangentially rather than overhead. This arrangement is satisfactory so far as the elimination of loops and twists is concerned but cannot be used on the normal creels and is very inefficient as to time consumed in effecting the warping operation, the loss of time resulting from the frictional drag of the rotatable spools which requires a low draw off speed to prevent thread breakage. It has been found that to avoid breakage it is frequently necessary to reduce the draw off speed to some thirty meters per minute.

2

It is therefore an object of this invention to provide warping apparatus that is capable of handling crepe threads drawn from stationary, non-rotating bobbins at very high draw off speeds while wholly eliminating the formation of the objectionable loops and twists that characterized the previous efforts of the art in this direction.

It is also an object of this invention to provide a method for the high speed warping of crepe threads that is characterized by the prevention of entanglements and thread breakage coupled with the maintenance of thread quality at a high value.

Other objects and advantages of this invention will be apparent upon consideration of the following detailed description of several embodiments thereof in conjunction with the annexed drawings wherein:

Figure 1 is a schematic view in side elevation of a running point of a creel incorporating the apparatus of the present invention and illustrating the processes of the present invention;

Figure 2 is a view similar to Figure 1 illustrating a modified type of apparatus;

Figure 3 is a view also similar to Figure 1 but illustrating a further modified type of apparatus;

Figure 4 is a view in front elevation of the apparatus of Figure 3; and

Figures 5 and 6 are views in elevation to an enlarged scale for the purpose of demonstrating the direction of twist of crepe threads, Figure 5 illustrating a Z-twist and Figure 6 an S-twist.

Referring now to the drawings in greater detail, the reference numeral 10 refers to a stationary, non-rotating wound body of twisted rayon thread such as crepe. The body 10 is shown diagrammatically but is intended to indicate bobbins, conical packages and other forms of wound twisted rayon thread of circular cross-section. The numeral 11 represents a warping beam at a point remote from the running point at which the thread body 10 is located. The thread body 10 is supported in a stationary, non-rotating manner on a creel spindle 12 diagrammatically indicated in Figures 1, 2 and 3. When the beam 11 is rotated at a peripheral speed of several hundred meters a minute, thread is drawn overhead from the body 10 and is wound on the beam. It will be understood that while but a single running point is illustrated in the Figures 1, 2 and 3 of the drawings, a large number of such points are contemplated as is customary in the construction of creels.

Referring now particularly to Figure 1, the numeral 13 represents a thread guide that is

3

spaced from the end of the wound body 10 a distance less than the radius of the wound body in its fully wound form. The numeral 14 represents a brake combined therewith. This arrangement alone is beneficial in preventing tangles and the like but it has been found, as a part of this invention, that superior results are attained if the thread is taken off overhead in such manner that the twist imparted thereto during the ballooning incident to unwinding is in the same direction and additive to the original twist of the component thread of the package 10.

In the preparation of crepe thread the high twist to which the initially parallel filaments are subjected, may be in either of two directions. In one direction the twist is called a Z-twist and in the other it is called an S-twist. These twists are illustrated in Figures 5 and 6. When the yarn has been wound on a cylindrical bobbin it can be withdrawn overhead from either direction. Thus, in the warping of crepe threads that have been wound on cylindrical bobbins, it is only necessary to place the bobbin on the creel support in such a way that when the thread is withdrawn it will balloon in such a way that the balloon twist will be additive to the twist to which the thread has already been subjected. When conical bobbins are used, however, they can only be unwound in an overhead manner from the small end and, in such cases, it is necessary to prewind the bobbin in such a way that during the unwinding off of the small end, the ballooning twist will correspond to the twine of the thread. In the threading-up of a creel, it must be borne in mind that commercial crepe warp consists of alternate threads of Z- and S-twists. Accordingly, if cylindrical bobbins are used, bobbins supplying parallel adjacent threads must be oppositely disposed on the spindles of the creel, and in the case of conical bobbins adjacent bobbins must be oppositely wound.

While the apparatus of Figure 1 is effective in preventing entanglement during the high speed warping of crepe threads, it has been found that there is a tendency of the thread to stick at the point indicated by the reference numeral 15 in Figure 1. This tendency is largely overcome by the additive twist effect described above. The additive twist, however, tends to form a balloon which has a great tendency to move forward in the direction of the arrow in Figure 1. If the thread guides used were nothing more than a small eye, as indicated at 13 in Figure 1, there is some tendency for the balloon to become clamped across the thread guide. This can be avoided by the use of a disc such as disc 16 shown in Figure 2, said disc being associated with a thread guide such as 17. The disc 16 may have a flat or conical shape and tends to baffle the balloon in such a way as to prevent entanglement with the thread guide. In lieu of a disc such as 16 combined with a thread guide such as 17, a unitary structure such as 18 may be used. This structure consists of a disc having a central orifice at 19 which functions as a thread guide. If desired, the opening at 19 may be defined by some special material which is inserted in the form of a sleeve. The discs 18 are so chosen with respect to diameter that when the creel frame is filled, adjacent discs 18 almost touch one another. In this regard see Figure 4. It will be understood that in any event, the discs 18 must be of sufficient diameter to prevent the thread from jumping over and becoming entangled on the left side of the disc,

4

as it is viewed in Figure 3. With the installation described in Figure 3, it is possible to dispose the thread brake 14 at some distance from the thread guide at 18.

It has been stated that the thread guide must be disposed close to the bobbin or package which is being unwound, the distance between the end of the bobbin adjacent the guide, and the guide being less than the radius of the fully wound bobbin at that end. In actual measurement this distance is ordinarily two centimeters or less. For convenience in operation the thread guides and/or discs may be arranged for sliding movement toward and from the end of the bobbin.

While several forms of the invention have been described, it will be understood that the illustrated forms of the invention are merely illustrative and that modifications are contemplated within the scope of the invention as defined by the following claims.

What is claimed is:

1. In the warping of high twist rayon such as crepe, the improvement that comprises supporting in a stationary, non-rotating unwinding position, a wound body of twisted rayon thread of circular cross section, drawing off thread from an end of said wound body while augmenting the existing twist of the component thread thereof, and guiding succeeding portions of the unwound thread at a point spaced axially from the draw-off end of the wound body a distance that is less than the radius of the fully wound body at its draw-off end.

2. In the warping of high twist rayon such as crepe, the improvement that comprises supporting in a stationary, non-rotating unwinding position, a wound body of twisted rayon thread of circular cross section, drawing off thread from an end of said wound body while augmenting the existing twist of the component thread thereof, and passing succeeding portions of the unwound thread through a small circular guiding zone located at a point spaced axially from the draw-off end of the wound body a distance that is less than the radius of the fully wound body at its draw-off end.

3. In the warping of high twist rayon such as crepe, the improvement that comprises supporting in a stationary, non-rotating unwinding position, a wound body of twisted rayon thread of circular cross section, drawing off thread from an end of said wound body while augmenting the existing twist of the component thread thereof, and guiding succeeding portions of the unwound thread at a point spaced axially from the draw-off end of the wound body at a distance that is less than the radius of the fully wound body at its draw-off end, and confining the axial extension of the ballooning thread to a distance from the unwinding end of the wound body not greater than the distance of said guiding point therefrom.

4. In apparatus for the warping of rayon threads which includes means for supporting in a stationary, non-rotating unwinding position, a wound body of rayon thread of circular cross-section, and draw-off device for drawing thread axially from one end of a wound body supported on said means, the improvement that comprises thread guiding means disposed in the thread path between the wound body and said draw-off device a distance from the draw-off end of the wound body that is less than the radius of the fully wound body at its draw-off end whereby high

5

speed warping of high twist thread may be effected.

5. In apparatus for the warping of rayon threads which includes means for supporting in a stationary, non-rotating unwinding position, a wound body of rayon thread of circular cross-section, and draw-off device for drawing thread axially from one end of a wound body supported on said means, the improvement that comprises a disc having a central thread guiding aperture, said disc being disposed in a plane normal to the thread path between said wound body and said draw-off device a distance from the draw-off end of the wound body that is less than the radius of the fully wound body at its draw-off end whereby high speed warping of high twist thread may be effected.

6. In apparatus for the warping of rayon threads which includes means for supporting in a stationary non-rotating unwinding position, a wound body of rayon thread of circular cross-section, and draw-off device for drawing thread axially from one end of a wound body supported on said means, the improvement that comprises thread guiding means disposed in the thread path between the wound body and said draw-off device a distance from the draw-off end of the wound body that is less than the radius of the fully wound body at its draw-off end, and disc means surrounding said guiding means whereby high speed warping of high twist thread may be effected.

7. In apparatus for the warping of rayon

6

thread which includes a plurality of closely spaced means, each for supporting in a stationary, non-rotating unwinding position a wound body of rayon thread of circular cross-section, and a common draw-off device for drawing thread axially from the same end of each wound body supported on said means, the improvement that comprises a plurality of disks each having a substantially central thread-guiding aperture therein, each of said disks lying in the thread path between each of said wound bodies and said draw-off device a distance from the draw-off end of each wound body which is less than the radius of the respective fully wound body at its draw-off end, the diameter of said disks being almost equal to the distance between adjacent supporting means.

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