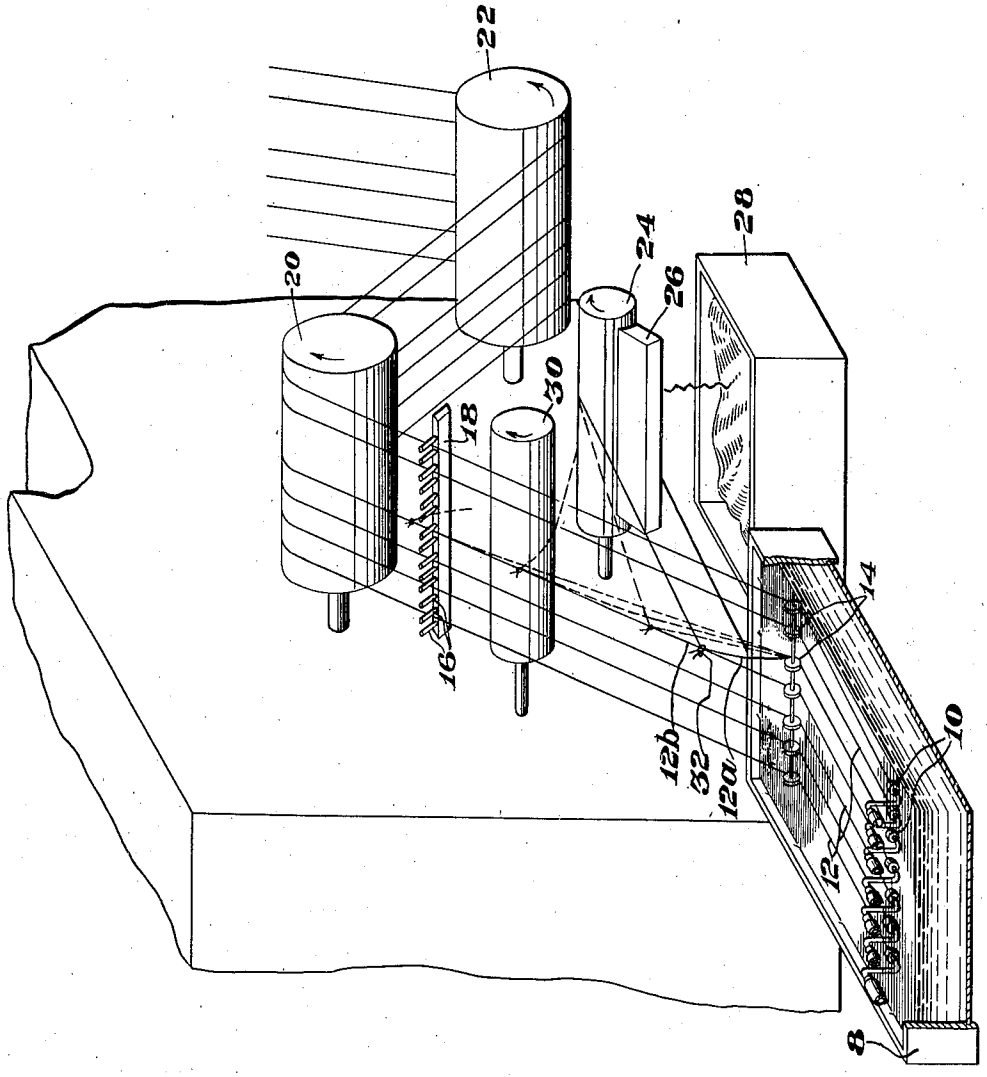
Jan. 1, 1946. E. H. SCHMIDT 2,392,268

THREAD BREAKER

Filed June 1, 1944



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Patented Jan. 1, 1946

2,392,268

UNITED STATES PATENT OFFICE

2,392,268

THREAD BREAKER

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Application June 1, 1944, Serial No. 538,242

4 Claims. (Cl. 28—1)

This invention relates to the processing of yarn, and more particularly it relates to a method and apparatus for rapidly threading a yarn about a series of yarn forwarding devices during a yarn processing operation.

Yarns are frequently processed by simultaneously passing a plurality of yarns about a series of spaced yarn forwarding devices. As the yarns pass about this series of forwarding devices, the yarns may be treated with various treating solutions; they may be dried, stretched, heated or otherwise processed. Often as many as 50 or 100 yarns, or even more, are simultaneously processed as a continuously moving yarn sheet moving about a series of driven rollers or similar yarn forwarding devices.

In the processing of a plurality of yarns in the manner above described, it is necessary to thread, or lead the yarns about the series of forwarding devices. Since the yarn forwarding devices used in the art for this purpose are generally driven rollers of the cantilever type with the unsupported ends of the rollers projecting toward the operator, little difficulty is experienced in threading, or leading the yarns manually about the series of rollers at the start of the processing operation.

It is frequently necessary, however, during the processing operation, to rethread one or more yarns about the series of rollers while the main body of yarns of the yarn sheet is being continuously processed. It is exceedingly difficult to manually thread a yarn about the rollers when the latter are already in operation forwarding a plurality of yarns. This is particularly true when the yarn is to be threaded adjacent the supported ends of the series of rollers.

It is, therefore, an object of this invention to provide a new and improved method of threading a yarn about a series of rollers which are engaged in forwarding a plurality of yarns.

It is another object of this invention to automatically thread a yarn about a series of rollers which are engaged in forwarding a plurality of yarns.

It is another object of this invention to automatically thread a yarn about a series of rollers engaged in forwarding a plurality of yarns and automatically severing the yarn at a desired point.

It is nother object of this invention to provide a new and useful method of severing yarns.

Other objects of the invention will appear hereinafter.

The details of the invention will be more clearly understood by reference to the following description when taken in connection with the accompanying illustration in which the single figure is a diagrammatic perspective view of one embodiment of apparatus constructed in accordance with the invention.

Referring to the drawing, reference numeral 8 designates a coagulating bath tank for the production of a plurality of rayon yarns. The yarns are produced by extruding a filament-forming composition, for example, viscose through a plurality of spinnerets 10. The extruded filaments forming the yarns 12 are coagulated in the bath in tank 8. In the production of viscose rayon, the coagulating bath may be acid, for example, the commonly used "Mueller" type coagulating, regenerating bath.

The yarns 12 are passed about freely rotating grooved rollers 14, then between pins 16 of comb guide 18, and then about a series of processing yarn forwarding rollers 20, 22, etc. A yarn waste roller 24 is positioned to temporarily forward one or more yarns from the bath tank until opportunity is had to thread the yarn or yarns about the yarn forwarding processing rollers 20 and 22. The yarn waste roller 24 is preferably positioned so that a plane passing through the axis of roller 24 and rollers 14 will lie at an acute angle to a plane passing through the axis of roller 20 and rollers 14. Waste roller 24 is preferably provided with a scraper 26 to remove waste yarn from this roller and pass the same to yarn waste container 28.

A yarn breaker roll 30 is positioned between the yarn waste roll 24 and the path of the yarns passing from rollers 14 to roller 20.

The apparatus described above operates in the following manner:

As shown in the drawing all yarns, with the exception of the third yarn from the right, designated as yarn 12*a*, are being passed about yarn forwarding rollers 20 and 22. (Although only two yarn-forwarding processing rollers are shown in the drawing, a large number of such rolls can be used to complete the desired processing of the yarn.) To thread the yarn 12*a* about yarn forwarding rollers 20, 22, etc., it is first passed from the bath tank 8 about the yarn waste roller 24. This roll, by frictional contact with the yarn, pulls the latter from the bath, and scraper 26 scrapes it into container 28. A tie-thread 32 is then passed about the yarn 12*a* and an adjacent yarn 12*b*, and the yarns 12*a* and 12*b* tied together by the tie-thread 32. The dotted lines show the relative positions of yarn 12*a* and the tie-thread 32 as they progress toward the yarn forwarding

roller 20. After the tied yarn is automatically threaded about the series of processing rollers, it is separated by positioning it between the proper pins of the comb guide.

In progressing toward yarn forwarding roller 20, the portion of yarn 12b between the knot in tie-thread 32 and the waste roller 24 must necessarily contact the breaker roller 30. The surface of breaker roller 30 which will come in contact with yarn 12b will move in a direction opposite to the yarn contacting surface of waste roller 24, and, therefore, the yarn-contacting surface of breaker roller 30 will move toward the path of the yarns passing from rollers 14 to roller 20. The portion of yarn between the knot in tie-thread 32 and the waste roller 24 will be drawn between rollers 24 and 30 until it breaks between them.

The friction characteristics of the surfaces of yarn contacting rollers 24 and 30 must be such that they will cling to the wet yarn with sufficient force to break or tear the yarn which is drawn between them by surface contact in the manner described above. The total frictional pull on the yarn by rollers 24 and 30, when the latter are composed of a molded or fused glass surface, and if both rollers have a contact with the yarn over an arc of at least 180°, is sufficient to tear or break the yarn satisfactorily between them in the manner set forth above.

A broken yarn 12a which is to be threaded as above described may, of course, be wrapped about waste roller 24 to impart a positive pull on the yarn as the latter contacts breaker roll 30.

Preferably, waste roller 24 and breaker roller 30 should have a peripheral speed approximately the same as the peripheral speed of the first yarn forwarding roller 20.

Although the invention has been described with particular reference to a rayon yarn spinning process, it will have utility in other processes in which it is necessary to thread a wet yarn about a series of yarn forwarding rollers which are engaged in forwarding a plurality of yarns. Furthermore, the method of breaking a wet yarn by frictional contact with two spaced friction surfaces moving in opposite directions may have utility in any process in which it may be desired to tear or break such a yarn.

Since it is obvious that many changes and modifications can be made in the above-described details without departing from the nature and spirit of the invention, it is to be understood that the invention is not to be limited to the above details except as set forth in the appended claims.

I claim:

1. The method of threading a wet yarn about a series of yarn forwarding rollers which are engaged in forwarding a plurality of yarns in a processing operation which comprises passing said yarn about a roller which will exert a pull thereon by frictional contact therewith, fastening said yarn to a yarn being forwarded by said forwarding rollers, pulling that portion of yarn which is between the fastening and frictional contact roller against another frictional contact roller whereby to tear the same.

2. The method of threading a wet yarn about a series of yarn forwarding rollers which are engaged in forwarding a plurality of yarns in a processing operation which comprises passing said yarn about a roller which will exert a pull thereon by frictional contact therewith, tying said yarn to a yarn being forwarded by said forwarding rollers, pulling that portion of yarn which is between the tie and the frictional contact roller against another frictional contact roller whereby to tear the same.

3. A yarn processing apparatus comprising a series of spaced yarn forwarding rollers, means for guiding a plurality of yarns to the first of said series of forwarding rollers, a yarn waste roller spaced from said first roller, and a yarn breaker roller between the waste roller and the path of the yarns approaching the said first roller.

4. A yarn spinning and processing apparatus comprising a plurality of yarn forming spinnerets, a series of spaced yarn forwarding rollers, means for passing the yarns from said spinnerets to the first of said series of forwarding rollers, a yarn waste roller spaced from said first roller and a yarn breaker roller between said waste roller and the path of the yarns approaching the said first roller.

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