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TWIST DIRECTION FINDER

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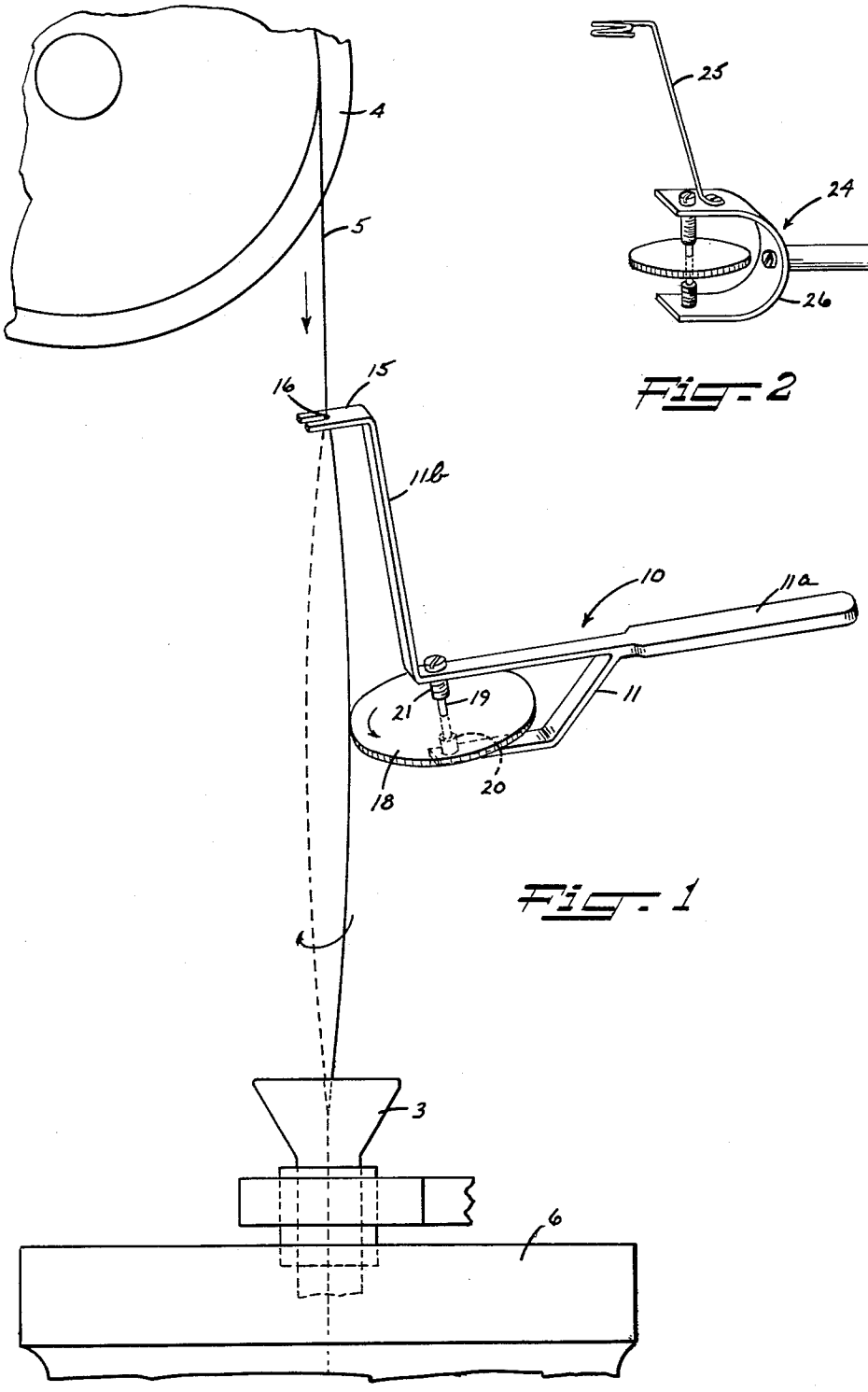


Fig. 1

Fig. 2

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TWIST DIRECTION FINDER

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This invention relates to a method and device for indicating the direction of twisting continuously running strands.

For example, on a rayon spinning machine of the multiple bucket type, rayon yarn is spun with either "s" twist or "z" twist. This is accomplished on a machine by changing terminals in the main switch for controlling the spindle motors in such a manner that the motors may run either clockwise or counterclockwise. Furthermore, each motor is electrically connected to a bus bar running lengthwise of the machine with respect to which the connectors for the motor may be reversed. Each spinning bucket is mounted on a spindle motor and the spinning bucket imparts twist to the yarn as it travels thereto from a godet in superposed spaced relation therewith. Since it is possible through human failure to connect the terminals oppositely to the connection intended, occasionally the twist obtained is reverse to that intended. The resulting twisted yarn, when woven into the finished fabric, will cause imperfect cloth.

A twist indicator has been provided in accordance with Patent No. 2,554,518 which may be applied to an unsupported length of yarn proceeding between the yarn advancing means and a twister. It has been found, for example, that all types of yarn would not balloon between the godet and the spinning funnel which distributes the windings of the yarn lengthwise of the spinning bucket. The assumption on which the prior art device operates is that the yarn must balloon to effect rotor vibration. It was found for some types of yarn, particularly those of heavier denier in the range of, for example, 300 to 900 denier, that such yarn frequently does not balloon. Thus the device under these conditions could not accurately indicate the direction of rotation. Moreover, it was found, in other instances, that it was possible to obtain either direction of rotation of the wheel of the twist indicator if the device was not held at exactly right angles to the path of the yarn. Apparently, the adverse direction of rotation was caused by friction from the lengthwise motion of the yarn.

It is therefore an important object of the present invention to provide a method and an apparatus whereby little care or skill is required to detect the direction in which a running yarn is being twisted.

It is another object to provide method and apparatus whereby the direction of twisting of heavy denier yarns as well as light denier yarns may be ascertained.

Still another object is to provide a method for which a twist indicator may be constructed to be applied to an unsupported length of a running strand adapted to substantially automatically align itself in an operating position with respect to the strand.

Another object is to provide a twist indicator capable of inducing rotary vibrations or ballooning in a strand being twisted when the strand does not, in the absence of the influence of the indicator, form a balloon.

Other objects, features, and advantages will become

apparent from the following description of the invention and the drawing relating thereto in which

Fig. 1 is a fragmentary view of spinning apparatus illustrating one embodiment of the invention in perspective view; and

Fig. 2 is a perspective view of another embodiment.

In brief, the present invention comprises a method and apparatus whereby a running strand may be engaged in a lateral direction as it proceeds to a conveyor by a device comprising a small portable frame, a rotatable element supported by the frame and having a generally circular periphery of which a portion is exposed in a radial direction for engaging the strand, the periphery being preferably serrated or indented, and an extension of the frame having a concave strand-guiding surface spaced from said exposed portion of the periphery in a direction generally parallel to the axis of rotation of the element and facing away from the axis.

In Fig. 1 is shown a spinning funnel **3** which is supported along a vertical reciprocal ambit in spaced underneath relation with a godet **4** rotating with respect to a fixed axis. The godet discharges a yarn **5** through the funnel into a bucket **6** with respect to which the funnel reciprocates longitudinally of its axis of rotation. As the bucket rotates the yarn **5** is twisted and normally caused to revolve in a circular path along the unsupported section of the yarn extending between the godet and the top of the funnel **3**. It also happens with some types of yarns, as pointed out above, that the yarn at the unsupported section of the yarn does not effect rotary vibratory motion. In accordance with the present invention, the yarn is to be held or urged in a direction that is lateral with respect to its length at one point along its unsupported section while the yarn is contacted by a rotor, held in a predetermined position and orientation with respect to the point at which the yarn is urged laterally at another point along the unsupported section, preferably between the first mentioned point and a twisting device, by a rotary element supported for free rotation and positioned in approximately fixed relation with the point at which the yarn is urged in a lateral direction.

To effect this principle of twist detection, a device **10** is provided which comprises a frame **11** having a handle portion **11***a* attached to, and extending from, the closed end of the U-shaped portion of the frame, an extension **11***b* of the frame terminating in a bifurcated end portion **15** which defines a concave surface **16**. Supported for free rotation between the legs of the frame is a rotary element **18** having a shaft **19** of which opposite ends are in pivotal bearing relationship with pivot bearings **20** and **21**. The pivot bearings may extend, as shown, through the legs of the frame in threaded relationship therewith.

At least a portion of the periphery of the rotor or the element **18** is exposed in a radial direction with respect to the axis of the element **18** whereby the periphery of the element may be brought into contact with a running strand such as the yarn **6**. The preferred point along the periphery for engaging the strand is that lying approximately in a plane which extends lengthwise through both legs of the frame **11**. Such a plane passes through the concave surface **16**, thus disposing this surface in spaced relation with the periphery of the element **18** in a direction therefrom approximately parallel to the axis of the element with the concave surface facing away from the axis. The periphery of the rotor or element **18** is disposed within a plane which is approximately perpendicular to the strand **5** at the instant the strand revolves into contact with the rotor.

The direction of twist in the yarn **6** may be ascertained through use of the device **10** by bringing the surface **16** into engagement with the yarn from a lateral direction

and urging the yarn, by light pressure, slightly out of its normal path as it proceeds between the godet **4** and the funnel guide **3**. By gently lowering the handle of the surface at the approximate point along the length of the yarn, the rotary element or wheel **18** is brought into engagement with the yarn which is now traveling within a rotary path or balloon between the point of engagement with the surface **16** and the top portion of the funnel **3**. The device **10** is held in this general position so that the periphery of the element **18** engages the strand traversing the rotary path or balloon merely along the nearest side thereof since the ballooning action of the strand would be destroyed were the periphery of the element moved directly into the balloon to a substantial extent. Under most circumstances, a balloon in a section of the strand passing between the godet and the funnel guide is already present and the guide merely facilitates the correct positioning of the device **10** with respect to the yarn. It also eliminates the necessity of having to hold the twist indicator or device at right angles because the yarn is automatically aligned over the wheel with the guide. However, if there is no initial balloon in the strand, the engagement of the concave surface therewith at some point spaced not far from the funnel guide or a twisting device brings into formation a balloon of which the revolving yarn thereof will drive the element.

Clockwise motion of the spinning bucket will produce "z" twist in the yarn and rotary vibration of the yarn within its balloon in a clockwise direction, which in turn drives the element **18** in a counterclockwise direction as viewed in a direction extending from a godet to the spinning bucket. Conversely, "s" twist is produced by a counterclockwise motion of the bucket and the yarn within the balloon is indicated by clockwise motion of the element **18**.

Fig. 2 illustrates a modified twist indicator **24** which functions in the same manner as that disclosed in Fig. 1 comprising a wire extension **25** attached to the frame **26** thereof. The extension **25** is illustrative of the manner in which existing twist indicators may be modified for operation in accordance with the method of the present invention.

While preferred embodiments of the invention have been shown and described, it is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A twist detector comprising a rotary element having a generally circular periphery, a thread guide having a concave thread-engaging surface that is open in a lateral direction with respect to the direction of yarn passage thereover, and means for supporting the guide and the element in spaced relationship, said means comprising bearing means for mounting the element for free rotation with respect to an axis in fixed relation with the guide, said means being arranged to expose a portion of the periphery of the element and to space the guide in a direction from said exposed portion of the element parallel to the axis with the concave surface facing away from the axis.

2. A twist detector comprising a frame, a rotary element having a generally circular periphery supported by the frame in freely rotatable relation therewith with a portion of the periphery exposed for access thereto from a direction extending radially from its axis of rotation, and an extension for the frame having a concave strand-guiding surface spaced from said portion of the periphery in a direction parallel to said axis, the concave surface facing generally away from the axis.

3. A twist detector comprising a frame having a U-shaped portion, a handle extending away from the closed end of the U-shaped portion, and an extension extending from, and in transverse relation with, one leg of the U-shaped portion within a plane containing both legs; a rotor supported by the frame with its axis extending through both legs and its periphery exposed in a radial direction beyond the ends of the legs, the end of said extension furthest removed from the U-shaped portion being notched to provide a concave strand-engaging surface facing away from the axis of the rotor.

4. A method of detecting the direction in which a running strand is being twisted comprising applying pressure from a lateral direction with a section of the strand as it proceeds from one means to a relatively spaced means along a revolving path, one of said means being operated to advance the strand from the other means under tension, one of said means being operated to twist the strand, placing a freely rotatable element having a circular periphery in a predetermined position and orientation between the point for applying pressure and the twisting means adjacent the region about which said path revolves wherein said periphery extends transversely to the path for repeated engagement by the revolving strand in passing along the path.

References Cited in the file of this patent

UNITED STATES PATENTS

1,125,622	Wons	Jan. 19, 1915
1,136,854	Wechsler	Apr. 20, 1915
1,686,390	Meyers	Oct. 2, 1928
2,165,416	Rydstedt	July 11, 1939
2,554,518	Buchanan	May 29, 1951