

[54] APPARATUS FOR ROTATABLY MOUNTING A YARN WINDING SUPPORT HAVING A MOVABLE YARN ENGAGING ELEMENT

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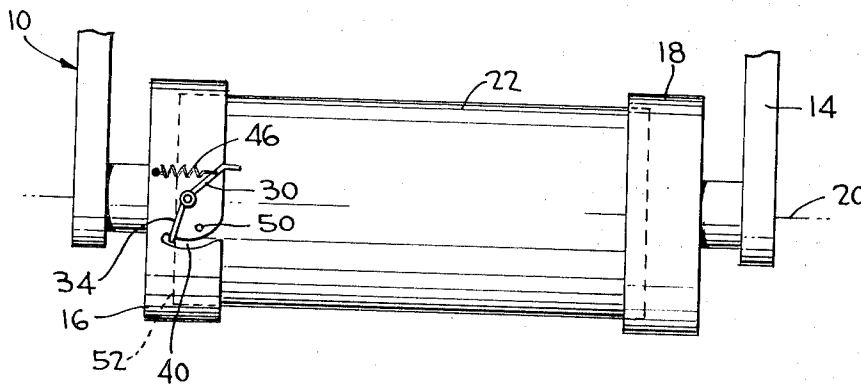
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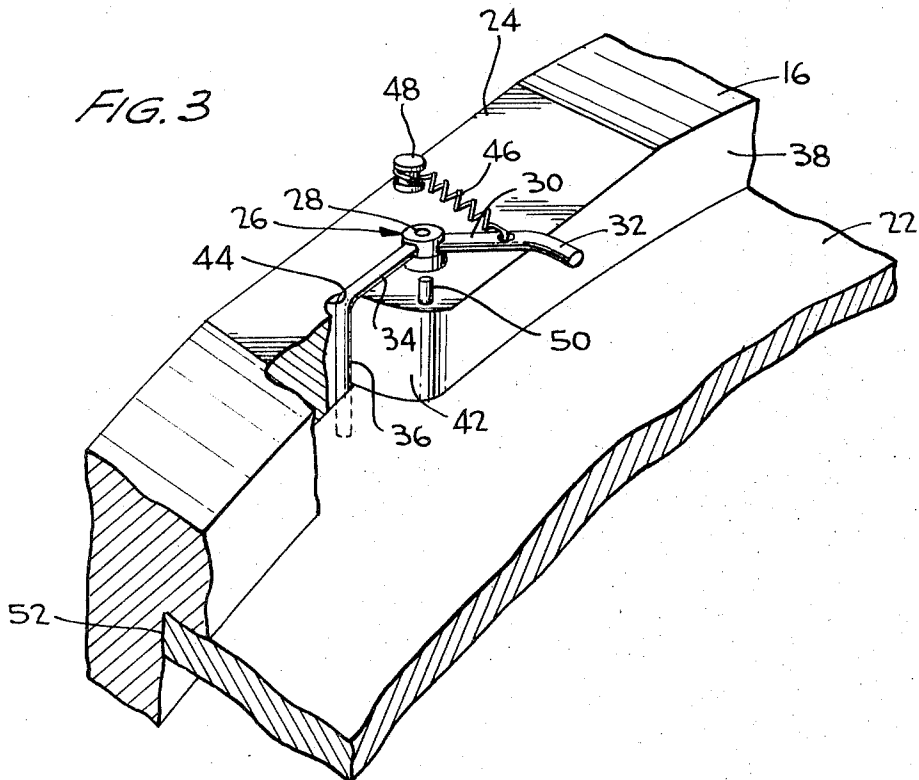
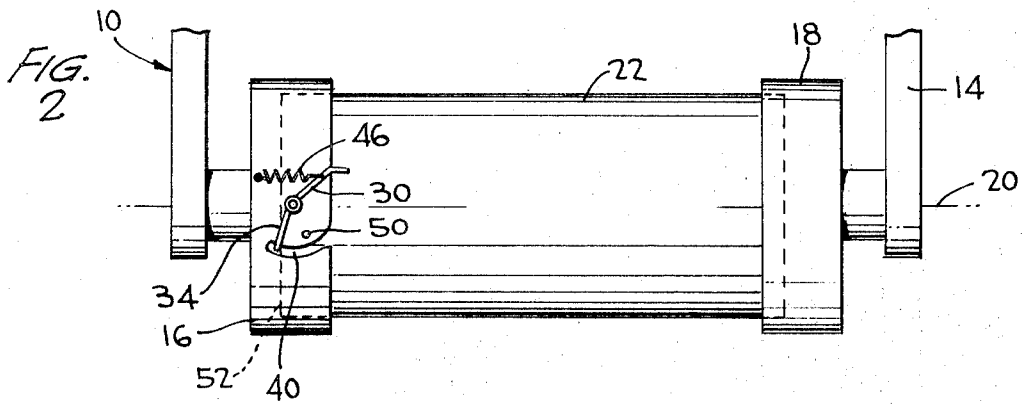
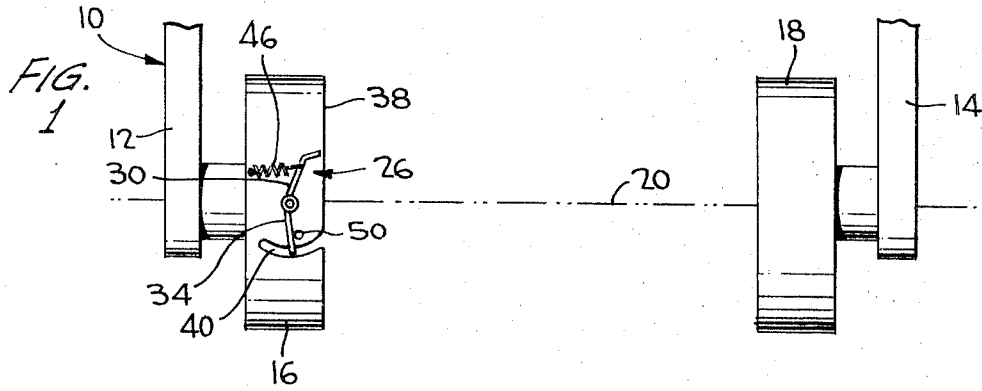
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[57] ABSTRACT

Apparatus for rotatably mounting a yarn winding support including a holder for mounting a yarn winding support for rotation and a yarn engaging element mounted on the holder and movable between an operative extending position and an inoperative withdrawn position, the yarn engaging element normally being in the inoperative withdrawn position so as not to interfere with the mounting of a yarn winding support on the holder and being responsive to the mounting of a yarn winding support on the holder to be automatically moved to the operative extending position and the yarn engaging element returning automatically to the inoperative withdrawn position as a yarn winding support is removed from the holder.

4 Claims, 3 Drawing Figures





APPARATUS FOR ROTATABLY MOUNTING A YARN WINDING SUPPORT HAVING A MOVABLE YARN ENGAGING ELEMENT

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention pertains to apparatus for rotatably mounting a yarn winding support and, more particularly, to such apparatus including a yarn engaging element movable so as not to interfere with the mounting and removal of a yarn winding support.

2. Discussion of the Prior Art

In the winding of textile yarns on a support, the yarn winding support is generally mounted for rotation on a holder having a pair of flanges engaging opposite ends of the yarn winding support. Extending from one of the flanges inwardly in parallel relation with the axis of the yarn winding support is normally positioned a yarn engaging or hooking element, which element is utilized to grasp the end of a yarn to be wound on the support to initiate the yarn winding operation. Yarn engaging elements are utilized with apparatus for winding yarn on a support not only to eliminate manual labor in commencing the winding of yarn on the support, but further, to precisely position the yarn on the winding support at the beginning of the winding operation, for instance, to form a piecing end and, also, to provide positive engagement of the end of the yarn to assure a reliable, initial winding of the yarn and prevent the yarn from escaping after the yarn is cut downstream of the winding support due to the additional tension on the yarn during the cutting operation.

Yarn engaging elements at the present are provided in the form of a simple pin rigidly secured on a rotating element of the holder adjacent one end of the winding support. When the winding support is mounted on a stirrup-piece which includes the two flanges engaging opposite ends of the winding support, the pin is positioned to extend inwardly from one of the flanges. The use of a simple pin structure for the yarn engaging element as described above has the disadvantage that the pin must project a predetermined length toward the center of the winding support; and, thus, the pin represents an obstacle interfering with the mounting of a yarn winding support on the flanges and, similarly, an obstacle interfering with removal of the winding support after the completion of winding of a yarn bundle on the support. This disadvantage is particularly acute where the mounting and removal operations are performed automatically since the relative movements of the flanges and the winding support are simple and predetermined; and, thus, if the yarn engagement pin is in the path of the winding support, it is not possible to automatically mount and remove the winding supports. Interference of the yarn engaging pin in the mounting and removal of winding supports is further accentuated when brakes are provided to operate with the flanges since the flanges can be stopped in such a position that the yarn engaging pin is directly in the path of movement of the winding support while the braking action with the flanges renders rotation of the flanges a difficult maneuver.

SUMMARY OF THE INVENTION

Accordingly, it is a primary object of the present invention to overcome the above-mentioned disadvantages by mounting a yarn engaging element on a holder

for a yarn winding support in a manner such that the yarn engaging element can be withdrawn so as not to interfere with mounting or removal of a yarn winding support.

Another object of the present invention is to mount a yarn engaging element on a holder such that the yarn engaging element is automatically withdrawn to an inoperative position when no yarn winding support is mounted on the holder such that the yarn engaging element will not interfere with the mounting of a yarn winding support on the holder.

An additional object of the present invention is to normally position a yarn engaging element in a withdrawn position on a holder and to automatically move the yarn engaging element to an operative extending position in response to mounting of a yarn winding support on the holder.

Some of the advantages of the present invention over the prior art are that the yarn engaging element does not interfere with mounting or removal of a yarn winding support on the flanges of a holder while movement of the yarn engaging element between an operative extending position and an inoperative withdrawn position is accomplished automatically in accordance with the position of a yarn winding support thereby not requiring additional manipulation by an operator, and the apparatus of the present invention is simple in nature requiring a minimum of moving parts and, therefore, can be inexpensively produced and utilized with existing winding equipment.

Preferably, the apparatus according to the present invention includes a holder having a pair of rotating flanges for gripping a yarn winding support at opposite ends and a yarn engaging element mounted on the flange located at the end of the yarn winding support where winding of the yarn is to commence. The yarn engaging element has an operative position extending longitudinally along the yarn winding support from the flange on which it is mounted, and an inoperative position withdrawn so as not to extend from the flange. Movement of the yarn engaging element from the inoperative withdrawn position to the operative extending position is performed automatically by engagement of the end of the yarn winding support with the yarn engaging element when the yarn winding support is mounted between the flanges such that the yarn engaging element is held in the operative position by the mounting of the yarn winding support during the entire winding operation. When the flanges are spread to release the yarn winding support, movement of the yarn winding support back to the inoperative withdrawn position is automatically provided by a spring controlling pivotal movement of the yarn engaging element. Accordingly, the yarn engaging element does not represent an obstacle interfering with mounting of a yarn winding support prior to winding or removal of a yarn winding support after winding; and, thus, mounting and removal of yarn winding supports on the apparatus can be accomplished automatically even when braked flanges are utilized.

The present invention is generally characterized in apparatus for rotatably mounting a winding support for yarn including a holder for mounting a yarn winding support for rotation, a yarn engaging element, and mounting means movably supporting the yarn engaging element on the holder in an extending operative position and in a withdrawn inoperative position, the

mounting means normally supporting the yarn engaging element in the inoperative position when no winding support is mounted on the holder and the mounting means being responsive to the mounting of a yarn winding support on the holder to move the yarn engaging element from the inoperative position to the operative position whereby the yarn engaging element does not interfere with mounting or removal of a yarn winding support on the holder and is automatically extended to the operative position after mounting of a yarn winding support on the holder.

Other objects and advantages of the present invention will become apparent from the following description of the preferred embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagrammatic side elevation of apparatus according to the present invention with the yarn engaging element in the inoperative position.

FIG. 2 is a diagrammatic side elevation of the apparatus of the present invention with the yarn engaging element in the operative position.

FIG. 3 is a broken perspective with parts in section of a flange mounting a yarn engaging element according to the present invention in combination with a yarn winding support.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Apparatus according to the present invention, as illustrated in FIGS. 1, 2 and 3, includes a holder assembly 10 having stirrup arms 12 and 14 and flanges 16 and 18 rotatably carried by the stirrup arms 12 and 14, respectively, the flanges 16 and 18 being coaxially disposed along an axis of rotation 20 for a tubular yarn winding support 22 to be clamped therebetween. The flanges 16 and 18 are movable along axis 20 to facilitate mounting and removal of the yarn winding support 22.

As best illustrated in FIG. 3, flange 16 has a flat 24 formed along the periphery thereof, and a yarn engaging element 26 is pivotally mounted on a pin 28 extending from flat 24, the axis of pin 28 being disposed transverse to the axis of rotation 20 of the yarn winding support 22 and located in the same plane as the axis 20. Yarn engaging element 26 includes an arm 30 extending transverse to the axis of pin 28 and having a bent end 32 disposed substantially in parallel with the axis of rotation 20 when the yarn engaging element 26 is in the extending operative position, as illustrated in FIGS. 2 and 3. Yarn engaging element 26 has a second arm 34 extending transverse to the axis of pin 28 and having a bent portion 36 extending toward axis 20 in parallel with the axis of pin 28.

Flange 16 has a face 38 with a notch 40 therein at flat 24, the notch 40 being defined on one side by a wall 42 having a curvature corresponding to the arc of a circle having a radius equal to the distance between the bent portion 36 of arm 34 and the axis of pin 28. A radially extending recess 44 is formed in the back wall of notch 40 in alignment with wall 42 to receive arm 34 of the yarn engaging element when the yarn engaging element is in the operative position. A coiled spring 46 is mounted in tension between a post 48 secured to flat 24 and arm 30 of the yarn engaging element in order to bias the yarn engaging element toward the withdrawn inoperative position. A stop 50 extends from flat

24 between the face 38 of flange 16 and pin 28 in order to limit movement of the yarn engaging element 26 by the spring 46 to precisely define the inoperative position for the yarn engaging element assuring that no portions thereof extend beyond the face 38 of the flange.

In operation, the yarn engaging element 26 is normally in the withdrawn inoperative position as illustrated in FIG. 1 when no yarn winding support is mounted in the holder 10 due to the tension from spring 46 pivoting the yarn engaging element 26 about pin 28 such that arm 34 engages stop 50. Thus, end 32 of arm 30 is withdrawn beyond face 38 of flange 16 such that the yarn engaging element does not extend beyond the flange and does not represent an obstacle interfering with mounting of a yarn winding support 22 in the holder. Accordingly, a yarn winding support 22 can be easily and automatically mounted between flanges 16 and 18; and, when yarn winding support 22 is mounted between the flanges with the flanges moved toward each other to engage the ends of the yarn winding support, the end 52 of yarn winding support 22 will engage the bent portion 36 of arm 34 of the yarn engaging element to pivot the yarn engaging element about pin 28 against the force from spring 46 to place the bent end 32 of arm 30 in a position extending beyond the face 38 of flange 16 along the yarn winding support 22 while the bent portion 36 of arm 34 is received in radially extending recess 44. Thus, mounting of the yarn winding support 22 on the holder automatically moves the yarn engaging element 26 to its extended operative position such that the bent end 32 may be utilized as a pin to initially engage yarn to be wound around the support 22.

When the flanges 16 and 18 are rotated along with the yarn winding support 22, the bent end 32 of the yarn engaging element will describe a circular path to catch a yarn having a path intersecting the circular path such that the yarn can be cut and winding of the yarn around the yarn winding support 22 can commence. Once winding is completed, flanges 16 and 18 are spread and the yarn winding support 22 removed from the holder. As the yarn winding support 22 is removed, arm 34 of the yarn engaging element follows movement of the end 52 of the yarn winding support under the influence of spring 46 such that the yarn engaging element is returned to its inoperative position withdrawn beyond the face 38 of flange 16 so as not to interfere with further removal of the yarn winding support or the mounting of a subsequent yarn winding support. The arcuate configuration of wall 42 guides movement of arm 34 of the yarn engaging element to assure simple, pivotal movement about pin 28.

While the present invention has been described with respect to the use of flanges supported by a stirrup-piece and with a specific configuration for the yarn engaging element, it will be appreciated that the yarn engaging element could have various configurations and, further, that the yarn engaging element could be mounted on any type of device for grasping a yarn winding support, such as a mandrel, a clamp with grasping flanges, externally or internally, etc. Furthermore, while the present invention is particularly advantageous for use in winding simple, assembled, twisted yarns formed of continuous filaments or discontinuous fibers, and obtained from chemical or natural fibers, it

will be appreciated that the apparatus of the present invention can be utilized with any textile yarn.

Inasmuch as the present invention is subject to many variations, modifications and changes in detail, it is intended that all matter described above or shown in the accompanying drawings, be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. Apparatus for mounting a winding support to rotate about the longitudinal axis thereof in order to wind yarn thereon, comprising:

holder means for mounting rotatably a yarn winding support, wherein said holder means includes a flange having a notch therein; and

a yarn engaging element mounted pivotally adjacent to said notch for rotation about a rotational axis extending transverse to the longitudinal axis of a mounted winding support, said yarn engaging element rotating between a retracted inoperative position in which the yarn engaging element does not extend beyond said flange and a projecting operative position in which at least a portion of said yarn engaging element projects beyond said flange to overlie a mounted winding support, said yarn engaging element having a first arm extending radially from said rotational axis and a second arm having a bent portion thereon extending generally parallel with said rotational axis and through said

notch in said flange, said bent portion being engaged and moved by a yarn winding support when the yarn winding support is mounted on said holder means to pivot said yarn engaging element from said inoperative to said operative position, whereby said yarn engaging element does not interfere with mounting and removal of a yarn winding support on said holder means and is extended automatically to said operative position after mounting of a yarn winding support on said holder means.

2. The apparatus as recited in claim 1 wherein said mounting means includes a spring mounted in tension between said flange and said first arm to bias said first arm toward said inoperative position.

3. The apparatus as recited in claim 2 wherein said flange has a wall defining a side of said notch, said wall having a curvature corresponding to the arc of a circle having a radius equal to the distance between the bent portion of said second arm and the axis of said pin and said wall engaging said second arm to guide said yarn engaging element during pivotal movement between said inoperative and operative positions.

4. The apparatus as recited in claim 3 wherein said flange has a radially extending recess therein in alignment with said curved wall of said notch to receive said second arm when said yarn engaging element is in said operative position.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,838,828 Dated October 1, 1974

Inventor(§) Jean-Claude HAUTEMONT

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the Heading, insert patentee's Foreign Application Priority data as follows:

-- Claims priority, application France, January 6, 1972,
No. 72/00575. --

Signed and sealed this 29th day of April 1975.

(SEAL)
Attest:

RUTH C. MASON
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