

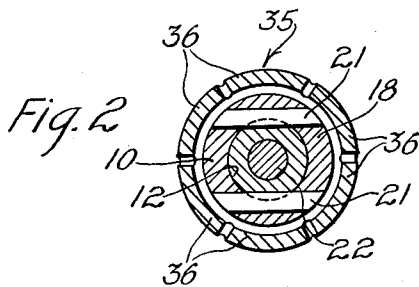
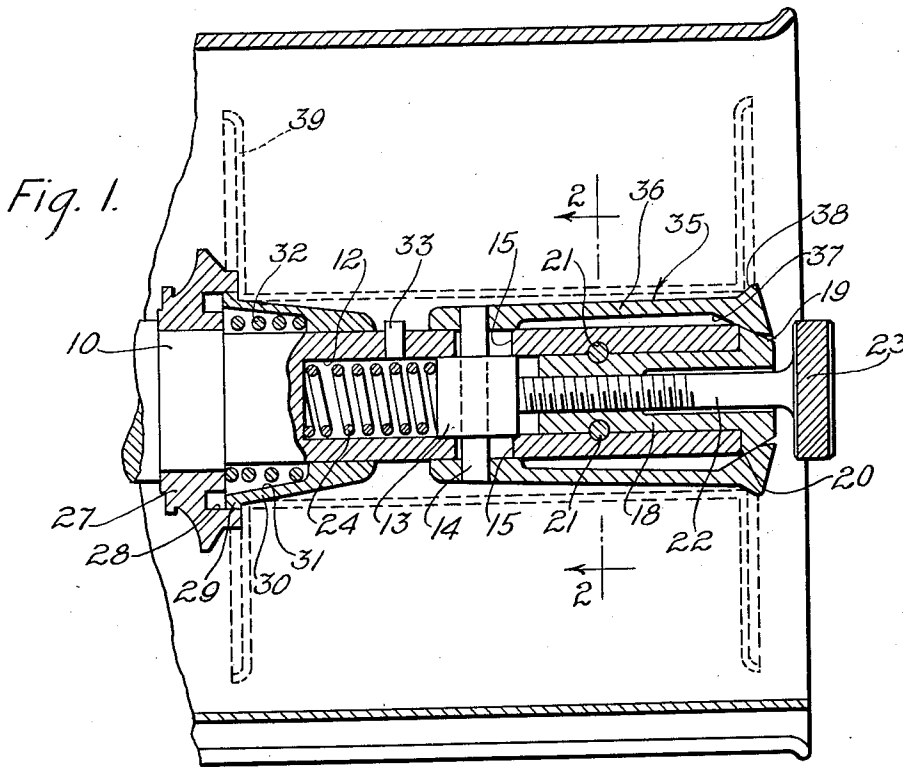
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MATERIAL SPOOLING MECHANISM

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MATERIAL-SPOOLING MECHANISM.

Original application filed July 12, 1924, Serial No. 725,660. Divided and this application filed January 2, 1926. Serial No. 78,841.

This invention relates to material spooling mechanisms and more particularly to a spool support, and has for its primary object the provision of an improved device of this type which permits a filled spool to be expeditiously removed from and an empty one firmly locked concentrically upon a driving spindle without removal of any parts.

10 This application is a division of my co-pending application, Serial No. 725,660, filed July 12, 1924, which has issued as Patent 1,608,249, dated November 28, 1926.

15 In accordance with one embodiment of this invention, mechanism is provided for locking and unlocking a take-up spool to and from its driving spindle, which comprises an expansible sleeve member rotatably secured to but longitudinally movable upon a spindle and adapted upon expansion to clamp the spool between a collar rotatable with the spindle and a plurality of cam surfaces upon the member.

20 Other objects and advantages of this invention will more fully appear from the following detailed description taken in connection with the accompanying drawing which illustrates one embodiment of this invention, in which

25 Fig. 1 is a vertical sectional view through the improved spool locking and unlocking device; and

30 Fig. 2 is a sectional view taken on the line 2-2 thereof looking in the direction indicated by the arrows.

35 In the drawing, the improved spool locking and unlocking device of this invention is shown applied to a take-up spool driving spindle of a wire drawing machine of the type illustrated and described in the hereinbefore referred to co-pending application.

40 Referring now to the drawing in detail, the numeral 10 indicates a take-up spool driving spindle which is continuously rotated by suitable mechanism (not shown). The spindle 10 projects from a take-up drive housing (not shown), and is provided with a bore 12 carrying substantially midway of its length a sliding block 13. The block 13 is secured to the spindle 10 to rotate therewith by a pin 14 fixed to the block 13 and projecting upon opposite sides into elongated slots 15 formed in the wall of the bored out portion of the spindle 10. With-
55 in the bore 12 at the right-hand side of the

block 13 is a sleeve 18 provided with an enlarged outer end in the form of a head 19, the peripheral surface of which is tapered inwardly from a point coincident with the periphery of the spindle 10 as indicated at 20. The sleeve 18 is fixed to the spindle 10 by pins 21. The bore of the sleeve 18 supports a screw 22 provided with a knurled head 23, the screw threaded shank of the screw being threaded into the bore of the sleeve 18 and adapted to engage the right-hand side of the block 13.

Resting at one end against the left-hand side of the block 13 and at its opposite end against the end wall of the bore 12 is a compression spring 24 for holding the block 13 in engagement at all times with the screw 22 so that upon turning outwardly the screw 22, the block 13 will follow to the right as viewed in Fig. 1 until the pin 14 rests at the right-hand end of the slots 15. Suitably keyed to the spindle 10 is a collar 27 against which the inside head of the spool is clamped. Upon its right-hand face the collar 27 is provided with an annular channel 28, and adapted to ride therein is an outwardly extending flange 29 formed upon a cone-shaped collar 30 free to slide longitudinally upon the spindle 10. Within a hollow formation 31 of the cone-shaped collar 30 is a compression spring 32, one end of which rests against the cone-shaped collar 30 and the opposite end against the collar 27. The collar 30 is limited in its movement to the right upon the spindle 10 by its engagement with a pin 33 projecting from the periphery of the spindle 10.

The pin 14 fixed to the block 13 and the ends thereof which pass through the slots 15 of the spindle 10 project into suitable openings formed in one end of collet 35 provided with six expanding jaws 36 (Fig. 2) and which is slidable longitudinally upon the spindle 10. The free ends of the jaws 36 are provided with an internally formed tapered surface 37 for engaging the tapered peripheral surface of the head 19 and also with an externally formed tapered surface 38, which project outside of the periphery of the body portion of the collet, and are adapted in the locking of a spool 39 upon the spindle 10 to engage the right-hand end of the bore of the spool (Fig. 1) to position the spool concentrically with the axis of the spindle and to lock it thereon, the left-hand

end of the spool being supported concentrically with the axis of the spindle 10 by the cone-shaped outer surface of the collar 30.

5 The operation of the spool locking device is as follows: It will be noted (Fig. 1) that the expanding jaws 36 of the collet 35 while in an operated position do not lie in a horizontal plane, but it will readily be understood that upon being released they assume a substantially horizontal position.

To release a filled spool from the spindle 10 and replace it with an empty one, the head 23 of the screw 22 is given a few turns in a counter-clockwise direction which allows the block 13 to move to the right, due to the energy stored in the compression spring 24 until the pin 14 rests at the right-hand end of the slot 15. In moving to the right, the block 13 through the pin 14 carries the collet 35 with it, thereby allowing the jaws 36 to return to their normal position, the internally formed tapered surface 37 riding down the tapered peripheral surface of the head 19 of the sleeve 18. This also releases the tapered surface 38 of the expanding jaws 36 from engagement with the spool. The jaws while in their normal released position lie wholly within the bore of the spool. Upon releasing the jaws 36 the spring 32 functions to move the cone-shaped collar 30 to the right which will insure that the next spool mounted in position, even though its bore is a trifle larger or smaller, will be concentrically mounted with respect to the axis of the spindle 10. In mounting an empty spool upon the device, the left-hand head of the spool is pressed into engagement with the flange 29 of the cone-collar 30 until the right-hand head of the spool is to the rear of the externally formed tapered surface 38 of the jaws 36, and thereupon the head 23 of the screw 22 is given a few turns in a clockwise direction which due to the end of the screw 22 engaging the block 13 the collet 35 will be moved to the left, thereby causing the internally formed tapered surface 37 of the expanding jaws 36 to ride up the tapered peripheral surface of the head 19 formed on the sleeve 18 and thereby cause a wedging action to take place between the externally formed tapered surface 38 and the vertical outside face of the spool head. This causes the spool to be firmly clamped between the collar 27 and the tapered surface 38 of the jaws 36 and thereby locked to the spindle 10.

It will thus be apparent that a filled spool may be readily removed from and an empty one firmly locked to the driving spindle without difficulty and within a short time, as well as without detaching any parts of the device which might become misplaced or lost. Also due to the spring pressed cone-shaped supporting and guiding collar 30 and the tapered surface 38 of the jaws 36, the

spool is always held concentric with the axis of the driving spindle 10, and upon the release of the jaws 36 the spring 32 functions to move the outside end of the spool outside of the tapered surface 38 of the jaws 36, thereby preventing jamming of the locking parts, with the result that no tools are required to lock or unlock the spool 39 to its driving spindle.

What is claimed is:

1. In a spool locking device, a driving element, a cam member having an offset tapered surface extending across a portion of the outer surface of and engageable with one head of a spool and arranged to rotate with said element, means rotatable with the driving element and having a tapered surface engaging another head of the spool, and means for causing relative movement between said means and member to clamp the heads between the tapered surfaces.

2. In a spool locking device, a driving element, a member provided with a plurality of offset tapered cam faces arranged to rotate with said element, said cam faces designed to be projected outside of the bore of a spool and into engagement with one head of the spool, means rotatable with the driving element and having a tapered surface engaging another head of the spool, and means for actuating said member to clamp the heads of the spool between the offset tapered cam faces of said member and the tapered surface means rotatable with the driving element.

3. In a spool locking device, a driving element, an expansible arbor member arranged to rotate with said element and relatively movable in a longitudinal direction, said member provided with a cam face designed to engage one head of a spool, a conical collar rotatable with the driving element engaging another head of the spool, said element and member designed upon a relative movement in a longitudinal direction to cause the expansion of said member and thereby clamp the heads of the spool between the cam face of the member and the collar rotatable with the driving element, and means for imparting a relative longitudinal movement between said element and member.

4. In a spool locking device, a driving element, a cam member engageable with one head of a spool and arranged to rotate with said element, means rotatable with the driving element engaging another head of the spool, means for causing relative movement between said means and member to clamp the head therebetween, and resiliently mounted means associated with said first mentioned means and having a surface engaging the second mentioned spool head for causing the spool to move longitudinally into a freely removable position upon a re-

verse actuation of said second mentioned means.

5 5. In a spool locking device, a driving element, a member arranged to rotate therewith
10 provided with a plurality of concentrically arranged cam faces, one of said cam faces
15 extending beyond the bore and engageable with one head of a spool and another cam face
20 engageable with a cam face provided upon the outer end of the driving element,
25 means rotatable with the driving element engaging another head of the spool, and
30 means for causing relative movement between the latter two mentioned cam faces
35 to cause the heads to be clamped between the first mentioned cam face and said means.

6. In a spool locking device, a driving element, a conical collar surrounding the element
20 for receiving the bore of one head of a spool, resilient means normally maintaining
25 the collar in a predetermined position longitudinally of the element, and an expandible
30 arbor carried by the element and provided with a cam face for engaging the
35 other head of the spool, thereby moving the collar against the resilient means to resiliently
40 clamp the spool between the cam face and the collar.

7. In a spool locking device, a hollow shaft
30 for receiving a spool, an internally threaded bushing secured in the end thereof and having
35 a cam faced annular head, a member slidably mounted within the shaft, a member threaded
40 through the bushing and engaging the slidably mounted member for moving the slidably mounted member longitudinally
45 of the shaft, and a clamping member exterior of the shaft and having one cam surface
50 engaging the cam face of the annular head and another cam face engaging and thereby clamping the spool upon the shaft,
55 said clamping member secured to and movable with said slidable member.

8. In a spool locking device, a hollow shaft
45 for receiving a spool, an internally threaded bushing secured in the end thereof and having
50 a cam faced annular head, a member slidably mounted within the shaft, a member threaded through the bushing and engaging
55 the slidably mounted member for moving the slidably mounted member longitudinally of the shaft, resilient means
60 mounted within the shaft and maintaining the slidable member in engagement with the threaded member, and a clamping member
65 exterior of the shaft and having one cam surface engaging the cam face of the annular head and another cam face engaging and
70 thereby clamping the spool upon the shaft, said clamping member secured to and movable
75 with said slidable member.

9. In a spool locking device, a hollow shaft
80 for receiving a spool, an internally threaded bushing secured in the end thereof and having a cam faced annular head, a member
85 slidably mounted within the shaft, a member threaded through the bushing and engaging the slidably mounted member for
90 moving the slidably mounted member longitudinally of the shaft, a conical collar slidably mounted around the shaft, resilient
95 means interposed between a portion of the collar and the shaft for maintaining the collar normally in a predetermined position,
100 and a clamping member exterior of the shaft and having one cam surface engaging the cam face of the annular head and another
105 cam face engaging and thereby clamping the spool upon the shaft against the force exerted by the resilient means on the collar,
110 said clamping member secured to and movable with said slidable member.

In witness whereof, I hereunto subscribe my name this 17th day of December, A. D. 1925.

JOHN NILSEN SELVIG.