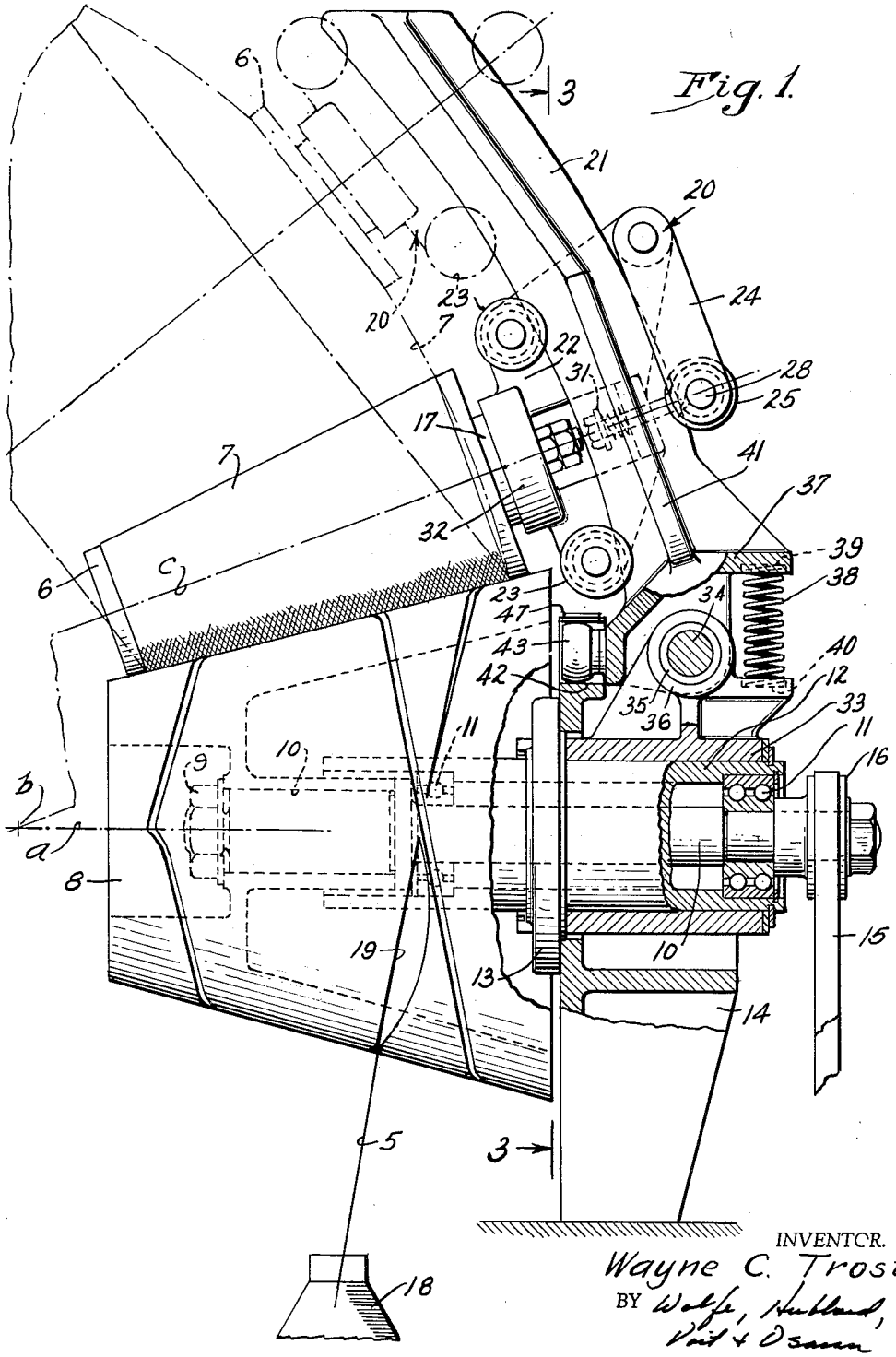
Sept. 18, 1962 W. C. TROST 3,054,567

CORE SUPPORTING MECHANISM FOR WINDING MACHINES

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Fig. 1.



INVENTOR.
Wayne C. Trost
BY Wolfe, Hubbard, Voit & Osann
ATTORNEYS

Sept. 18, 1962 W. C. TROST 3,054,567

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Fig. 2.

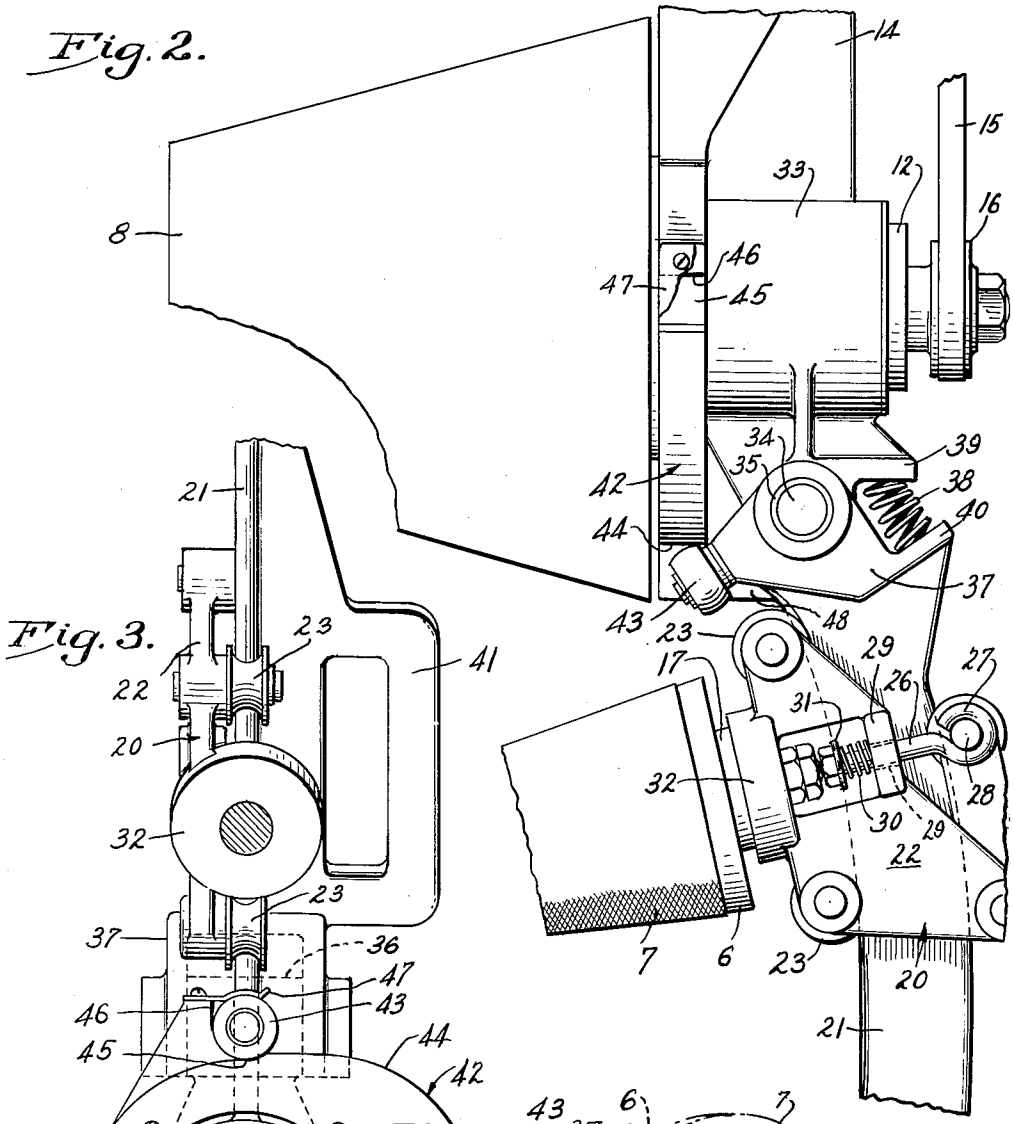


Fig. 3.

INVENTOR.
Wayne C. Trost
BY Wolfe, Hubbard, Leit + Dunn
ATTORNEYS

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CORE SUPPORTING MECHANISM FOR WINDING MACHINES

Wayne C. Trost, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill., a corporation of Illinois

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This invention relates to a machine for winding a conical yarn package and, more particularly, to a machine in which the package is turned by a conical drum frictionally engaging the package. In such a machine, the yarn extends into a groove in the surface of the drum and the groove guides the yarn back and forth from one end of the package to the other during the winding operation. As the package builds up, it moves away from the drum along an arcuate path whose center preferably is coincident with the intersection of the axes of the drum and the package.

One object of the invention is to support the package by a novel means which does not extend laterally beyond the drum supporting mechanism so that the space requirements are minimized and a plurality of winding units may be mounted compactly on a common frame.

Another object is to arrange the package supporting mechanism whereby, after the winding is completed, this mechanism may be utilized to swing the package away from the drum and to a doffing position.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which

FIGURE 1 is a front elevation of a winding mechanism embodying the novel features of the present invention.

FIG. 2 is a fragmentary plan view of the mechanism.

FIG. 3 is a fragmentary sectional view taken along the line 3—3 in FIG. 1.

As shown in the drawings for purposes of illustration, the invention is embodied in a spooler for winding yarn 5 on a conical core 6 to produce a conical yarn package 7. Such winding is effected by a conical drum 8 secured by a nut 9 to a horizontal shaft 10. The latter is journaled by bearings 11 in a sleeve 12 to turn about a horizontal axis *a* and the sleeve, in turn, is formed with a flange 13 bolted to a stationary frame 14 to hold the sleeve against turning. The shaft 10 is turned by a suitable power source (not shown) through a belt 15 which extends around a pulley 16 secured to the outer end of the shaft.

Disposed above the drum 8 is a rotatable support 17 for the core 6. The support is mounted to swing about a center *b* which is coincident with the apex of the drum and the axis *c* of rotation of the support intersects the axis *a* of the drum at this center. In this way, the yarn package is in continuous frictional driving engagement with the drum as it builds up to the size shown in broken lines in FIG. 1.

The yarn 5 is unwound from a supply bobbin 18 and passes through a groove 19 in the periphery of the drum to guide the yarn back and forth along the length of the core 6. The groove is arranged to lay more thread on the large end of the yarn package than on the small end to give the package a conical shape and uniform density. For this purpose, the groove may be laid out with one part as a straight line and the other a compensated parabola in the manner disclosed in my copending application Serial No. 836,641, filed August 28, 1959, to which reference may be had for the details of construction.

The present invention contemplates the provision of a

novel means for mounting the core support 17 to swing about the center *b* while requiring a minimum of lateral space so that a series of winding units may be mounted comparatively close together on a single frame. This means comprises a carrier 20 which supports the core 6 adjacent the large end thereof and which moves up and down along an arcuate track 21 disposed above the drum 8. The center of the arcuate track is the center *b* so that the package core 6 moves as if it were pivotally mounted at this center.

Herein, the carrier 20 includes a body 22 on which are journalled two spaced rollers 23 engaging the inner or concave side of the track 21. An arm 24 is pivotally connected to the body and supports a third roller 25 at its free end. A pin 26 (FIG. 2) is formed with a hooked end portion 27 encircling the axle 28 of the roller 25 and projects through a hole 29 in the body 22. A compression spring 30 surrounding the pin acts between the body and an abutment 31 on the other end of the pin. The spring 30 produces a force which urges all three rollers against the track and which tends to hold the carrier 20 frictionally in place on the track so that the package 7 bears against the driving drum 8. The package core 6 is removably mounted on the support 17 which is journaled in a bearing 32 on the carrier body.

According to another aspect of the invention, advantage is taken of the track 21 to provide a comparatively simple arrangement for moving the completed package 7 out of engagement with the drum 8 and into a position where it may easily be doffed. To this end, the track is mounted on a sleeve 33 which is exteriorly journaled on the sleeve 12 so that the track and the package may be swung bodily together about the axis of the drum 8 and moved to the front of the machine where it is accessible to the operator. The track is pivotally connected to the sleeve 33 to swing relative thereto about an axis extending transversely of the drum to permit the package to be swung back out of engagement with the drum.

In the present instance, the track 21 is pivotally mounted on the sleeve 33 by means of a shaft 34 journaled in a bearing 35 received in a boss 36 which is integral with the sleeve, the shaft 34 projecting to opposite sides of the boss. A bracket 37 extending from the inner end of the track straddles the boss and is received on the end portions of the shaft thereby supporting the track for swinging relative to the sleeve 33 about the axis of the shaft 34. A compression spring 38 acts between abutments 39 and 40 formed on the track and the boss 36 respectively and urges the track in a direction to hold the package 7 against the drum 8. A handle 41 (see FIG. 3) formed integrally with the track and projecting forwardly from the front thereof may be employed as a convenient means by which the operator may pull the track forward to the doffing position.

Means is provided for swinging the track 21 about the axis of the shaft 34 automatically as an incident to the turning of the track forward to the doffing position. Herein, this means comprises a cam 42 and follower 43 mounted on the frame 14 and the track 21 respectively with the follower riding on the cam as the track is swung back and forth between the winding and doffing positions. The cam is formed by a plate surrounding the sleeve 33 and bolted to the frame and the active surface 44 of the cam is the peripheral surface of the plate and extends through approximately 90 degrees, that is, between the two positions of the track as illustrated in FIG. 3. The follower 43 is a roller journaled on the bracket 37 and is held against the cam surface 44 by the spring 38. From the top of the cam 42 to the side, the surface 44 rises so that the track 21 is swung back (counterclockwise in FIG. 2) as it is turned from the upright or winding position (full lines in FIG. 3) to the doffing

position (broken lines). Conversely, the track swings in when turned in the opposite direction.

In order to position and hold the track **21** accurately in the winding position, the follower roller **43** drops into a notch **45** (FIG. 3) in the sam surface **44** when in this position and abuts against a stop **46**. The latter is in the form of a lug integral with and upstanding from the cam plate **42**. While the spring **38** tends to hold the follower in the notch, it may be assisted by a spring clip **47** (FIGS. 1 and 3) which is fastened to the lug **46** and whose free end portion snaps over the follower as the latter enters the notch. Downward turning of the track **21** of the doffing position is limited by a stop **48** which is formed by the plate **42** and which is engaged by the bracket **37**.

It will be seen that the curved track **21** supports the core **6** to move about the center *b* as the package builds up and that it does this without any parts extending laterally beyond the mechanism supporting the winding drum **8**. Moreover, the track is supported so that it may easily be swung to the front of the machine for convenient doffing of the completed package.

I claim as my invention:

1. In a machine for winding yarn on a conical core, the combination of, a frame, a power rotated conical drum journaled on said frame to turn about its longitudinal axis, an arcuate track disposed in a radial plane of said drum and extending away from the drum, a carrier movable back and forth along said track, a spindle journaled on said carrier and projecting radially of said track with its axis intersecting the axis of said drum, said spindle being adapted to support a core in frictional engagement with said drum, a member journaled on said frame to turn about the axis of said drum, a pivot connecting said member and said track and supporting the track for turning about said axis with said member and for swinging relative to said member about a transverse axis, and cam means operable as an incident to turning of the member to swing said track about said pivot thereby to move said core away from said drum.

2. In a machine for winding yarn on a core, the combination of, a frame, a power rotated drum journaled on said frame to turn about its longitudinal axis, an elongated track disposed in a radial plane of said drum and extending away from the drum, a carrier movable back and forth along said track, a spindle journaled on said carrier and adapted to support a core in frictional engagement with said drum, a member journaled on said frame to turn about the axis of said drum, a pivot connecting said member and said track and supporting the track

for turning bodily with said member about said axis and for swinging relative to said member about a transverse axis, a stationary cam mounted on said frame and having a cam surface extending around the axis of said drum, and a follower mounted on said track and engaging said cam surface, said cam and follower coacting upon turning of the member to swing said track about said pivot thereby to move said core away from said drum.

3. In a machine for winding yarn on a core, the combination of, a frame, a power rotated drum journaled on said frame to turn about its longitudinal axis, an elongated track disposed in a radial plane of said drum and extending away from the drum, a carrier movable back and forth along said track, a spindle journaled on said carrier and adapted to support a core in frictional engagement with said drum, a member journaled on said frame to turn about the axis of said drum, a pivot connecting said member and said track and supporting the track for turning bodily with said member about said axis and for swinging relative to said member about a transverse axis, a spring acting between said member and said track and operable to urge the track in a direction to hold said core in engagement with said drum, and cam means operable as an incident to turning of the member to swing the track about said pivot thereby to move said core away from said drum against the action of said spring.

4. In a machine for winding yarn on a core, the combination of, a frame, a power rotated drum journaled on said frame to turn about its longitudinal axis, an elongated track disposed in a radial plane of said drum and extending away from the drum, a carrier movable back and forth along said track, a spindle journaled on said carrier and adapted to support a core in frictional engagement with said drum, a member journaled on said frame to turn about the axis of said drum, a pivot connecting said member and said track and supporting the track for turning bodily with said member about said axis and for swinging relative to said member about a transverse axis, and cam means operable as an incident to turning of the member to swing said track about said pivot thereby to move said core away from said drum.

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