

April 2, 1968

A. R. CONFORTI ET AL

3,375,991

MULTIPLE SPOOL WIND-UP DEVICE

Filed March 18, 1966

2 Sheets-Sheet 1

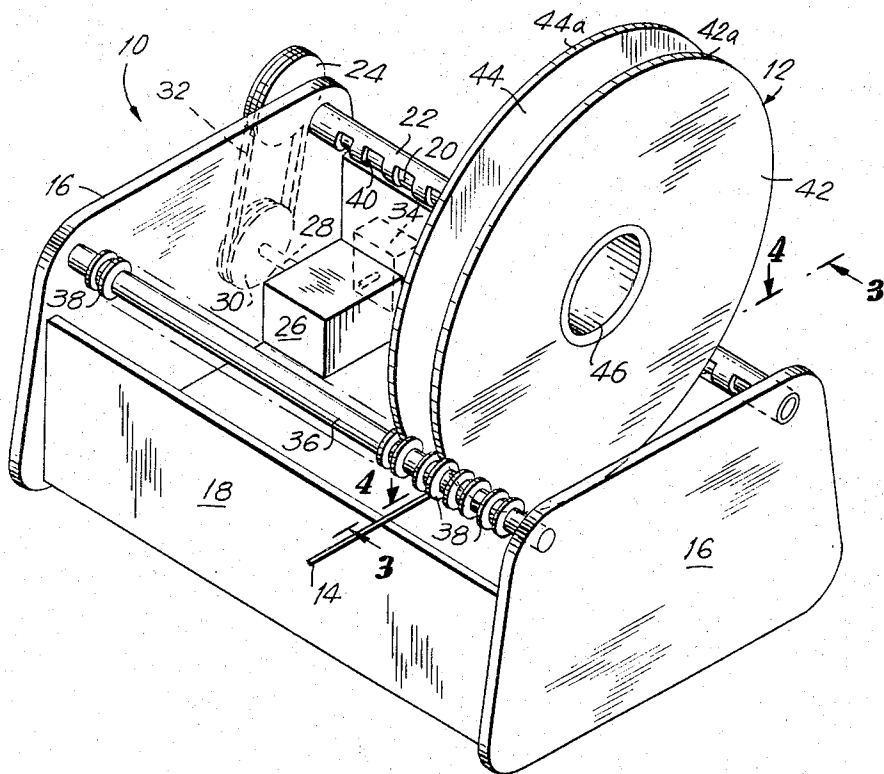


FIG. 1

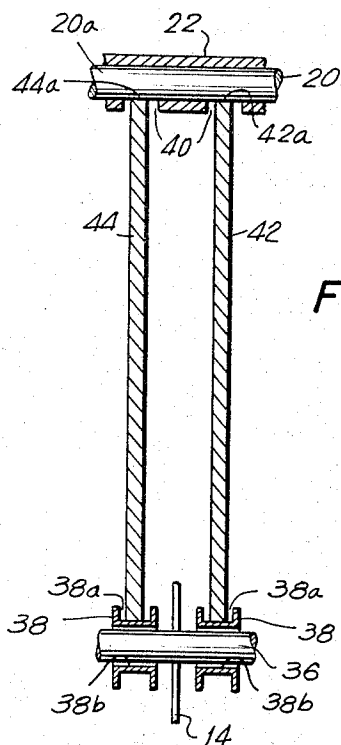


FIG. 4

BY

INVENTORS.
ARTHUR R. CONFORTI
EDWARD CONFORTI

Amster & Rothstein
ATTORNEYS

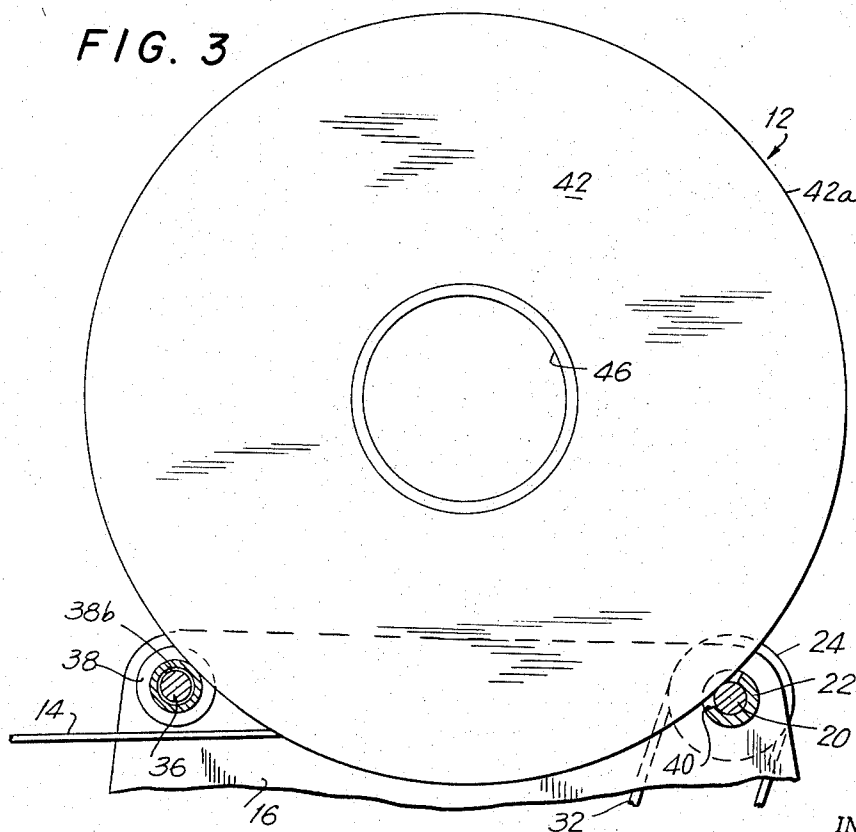
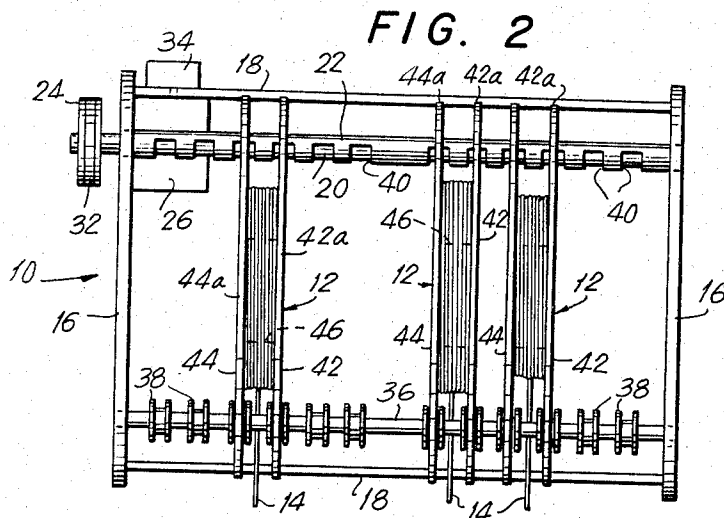
April 2, 1968

A. R. CONFORTI ETAL
MULTIPLE SPOOL WIND-UP DEVICE

3,375,991

Filed March 18, 1966

2 Sheets-Sheet 2



BY

INVENTORS.
ARTHUR R. CONFORTI
EDWARD CONFORTI

Amster & Rothstein
ATTORNEYS

1

3,375,991

MULTIPLE SPOOL WIND-UP DEVICE

Arthur R. Conforti, 860 Duncan Drive, Westbury, N.Y. 11590, and Edward Conforti, 153 India St., Greenpoint, Brooklyn, N.Y. 11222

Filed Mar. 18, 1966, Ser. No. 535,539

1 Claim. (Cl. 242—66)

ABSTRACT OF THE DISCLOSURE

A wind-up device for one or more spools which are straddled between a drive shaft which, when rotated, drives the spools in rotation and a support shaft having thereon rotatable idler members for each spool such that the spools can be rotated at different speeds. These different speeds may unavoidably result from the different drag resistances of the materials being wound on the spools.

The present invention relates to the handling of materials put up in a supply roll on a spool or the like, and more particularly to an improved wind-up device for efficiently servicing plural supply spools during a winding operation.

Cable and other such materials are usually wound for convenience in handling on spools by a winding apparatus such as is disclosed in U.S. Patent 2,679,987 issued to E. M. Saliba. The winding apparatus exemplified by the apparatus of this patent includes a drive shaft and an idler shaft spaced apart from each other and in practice supporting a supply spool in a straddling position therebetween. The contact of the peripheral edges of the spool against the drive shaft results in the spool being powered in rotation in response to rotation of the drive shaft, and this in turn results in the winding of the cable about the core of the spool. The wind-up device of the present invention is of the same general classification as the foregoing apparatus, but has significant improvements embodied therein which greatly increases the range of its application.

Broadly, it is an object of the present invention to provide an improved wind-up device which is not limited to the servicing of only one spool during a winding operation, but which can efficiently handle a bank of such spools. Specifically, it is an object of the present invention to provide a wind-up device for simultaneously powering a plurality of spools in rotation during a winding operation, and wherein the winding of any one or more of these spools can be terminated while the winding operation of the remaining spools is continued.

Although not limited strictly to use as auxiliary equipment for a border knitting machine, the wind-up device of the present invention is perhaps best used to advantage with such machinery. This is for the reason that this type of machinery usually produces several lengths of material, all of which must be wound on a spool. Moreover, the winding of each of these spools must be done with a minimum of pulling tension otherwise damage to the knitting needles is likely. Thus, this machinery is particularly suitable for use of the wind-up device hereof since the winding of any one spool is conducted completely independently of the winding of the other spools. That is, if there is no slack in the material being wound on one spool, the winding of this spool is temporarily discontinued without effect on the winding operation of the other spools. This versatile mode of operation is achieved by providing an independent idler support for each of the spools in their positions straddling a drive shaft and support shaft. Thus, the stationary condition of any one spool has no effect on the operating conditions for the

2

other spools since the drive shaft continues to rotate at the same rotational speed despite this stationary condition of one or more spools and the idler support means for each of the spools is, of course, unaffected by such stationary condition because of the independent nature of the several idler support means.

The above brief description, as well as further objects, features and advantages of the present invention will be more fully appreciated by reference to the following detailed description of a presently preferred, but nonetheless illustrative embodiment in accordance with the present invention, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a multiple spool wind-up device demonstrating features of the present invention; FIG. 2 is a plan view of the wind-up device showing a typical use thereof serving multiple spools;

FIG. 3 is a partial elevational view, on an enlarged scale, in section taken on line 3—3 of FIG. 1; and

FIG. 4 is a partial plan view, also on an enlarged scale, in section taken on line 4—4 of FIG. 1 illustrating the peripheral contact of the bottom portion of the spool with a drive shaft and idler members of the wind-up device hereof.

Reference is now made to the drawings wherein there is shown a wind-up device, generally designated 10, suitable for driving a multiple bank of spools 12 in rotation to wind material on the spools. In FIG. 1, a solitary spool 12 of a contemplated bank of spools is shown in order to permit a clearer showing of the structural details of the device 10. The showing, however, of the three spools 12 in FIG. 2 is more typical of the use contemplated for the wind-up device 10. Further in this regard, although not limited to use as auxiliary equipment for a border knitting machine, the wind-up device 10 hereof is perhaps used to greatest advantage with such machinery. This is for the reason that the border knit goods, herein designated 14, produced by this machinery and put up in a supply roll on the spools 12 must be wound on such spools with a minimum of pulling tension otherwise damage to the knitting needles is likely. In these and similar circumstances, the wind-up device 10 is particularly suitable because the spools 12 are driven in rotation during the winding operation at a relatively low torque. Stated another way, when the slack in the border knit goods 14 is taken up during the winding operation, the low torque operation of the wind-up device 10 is such that further winding of the spool 12 will terminate and slippage relative to the spool 12 will occur before any appreciable stress is transmitted to the knitting needles via the then taut condition of the goods 14.

In a preferred embodiment such as is illustrated herein, the wind-up device 10 includes a box-like structure having side and end walls 16 and 18, respectively, defining an open top in which is supported a peripheral drive for the spools 12. This spool drive includes a drive shaft 20 appropriately journaled at opposite end for rotation in the end walls 16, 18 and enclosed within a stationary notched cylindrical housing 22. As best seen in FIG. 2, an end of the drive shaft 20 extends beyond one end wall 16 and has a pulley 24 fixedly mounted thereon. A variable speed motor 26 within the support structure has a motor shaft 28 disposed through the end wall 16 and similarly mounts a pulley 30 thereon. A pulley belt 32 trained about the pulleys 30, 24 transmits rotational power of the motor 26 to the drive shaft 20, the speed of such rotation being controlled by conventional speed control means 34 provided as auxiliary equipment for the motor 26.

Extending substantially parallel to the drive shaft 20 in the open top of the support structure is a stationary

support shaft 36 having plural idler members 38 rotatably and slidably supported therein. A minimum of two and a maximum number of idler members 38 equal to the theoretical capacity of the wind-up device 10 is disposed on the support shaft 36 prior to securing the ends of this shaft in the walls 16 and 18. In the embodiment of the device 10 illustrated herein a six spool capacity is contemplated so the stationary housing 22 has twelve uniform notches 40 in the side facing the support shaft 36, one pair of each of these notches being allotted to a spool 12, and twelve idler members 38 on the support shaft 36, each pair of these idler members also being allotted to a single spool 12.

Each wind-up spool 12 is of a conventional construction including two side discs 42 and 44 and having a central core 46 on which an elongated material, exemplified by border knit goods 14, is appropriately spooled or wound. The winding operation is achieved by having the spool 12 straddle the drive shaft 20 and support shaft 36, this straddle position of each spool 12 being such that the peripheral edge 42a and 44a of the side discs are disposed in a cooperating pair of notches 40 and idler members 38. That is, as best shown in FIG. 4, access to the drive shaft 20 is achieved through the notches 40 in the housing 22, the peripheral surfaces 42a, 44a making actual physical contact against the peripheral surface 20a of the drive shaft 20. On the other side of the wind-up device 10, the spool side discs 42, 44 are disposed in annular grooves 38a appropriately formed in each idler member 38. Additionally, each idler member 38 has an axial opening 38b which is slightly larger than the diameter of the support shaft 36 so that each idler member 38 is both freely slidable along the length of the support shaft 36 and also freely rotatable about the support shaft.

In a typical use of the wind-up device 10, several spools 12, such as is shown in FIG. 2, are appropriately positioned in the open top of the device 10 in supported positions straddling the drive shaft 20 and the support shaft 36. Each position of a spool 12 is generally fixed by the notches 40 which, in an obvious manner, limit the extent of movement of the spool 12 along the length of the drive shaft 20 to the axial dimension of the notches 40. In response to rotation of the drive shaft 20, each spool 12 is driven in rotation independently of the other spools. That is, if all of the slack is removed from the

material being wound on a particular spool, this spool will be held against rotation by the taut condition of the material 14 and the drive shaft 20 will continue rotating past the peripheral surfaces 42a, 44a of the discs of this spool without having a driving effect on the spool. The stationary condition of this spool, however, has no effect whatsoever on the other spools since this stationary condition is transmitted only to the pair of idler members 38 associated with this spool. This does not in any way interfere with the free rotation of the idler members 38 supporting the other spools which can still be rotated for continued winding of material thereon.

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claim be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What is claimed is:

1. A multiple spool wind-up device comprising a support, a drive shaft journaled for rotation on said support and operatively connected to be driven in rotation, a support shaft mounted on said support in spaced relation to said drive shaft for receiving spools in a straddling position therebetween incident to driving said spools in rotation for wind-up of material thereon in response to rotation of said drive shaft, plural idler members on said support shaft accommodating said spools therein for providing independent rotation for each of said spools relative to said support shaft, and a hollow cylindrical member disposed concentrically about said drive shaft and having spaced notches therein of a predetermined axial dimension for permitting access of these spools to said drive shaft while limiting movement of a spool along the axis of said drive shaft to said axial dimension.

References Cited

UNITED STATES PATENTS

2,679,987	6/1954	Saliba	242—66
2,721,710	10/1955	Birchler	242—66 X

FRANK J. COHEN, *Primary Examiner*.

N. L. MINTZ, *Assistant Examiner*.