April 16, 1940. H. NAUMANN 2,197,747

MULTIPLE YARN PACKAGE HOLDER

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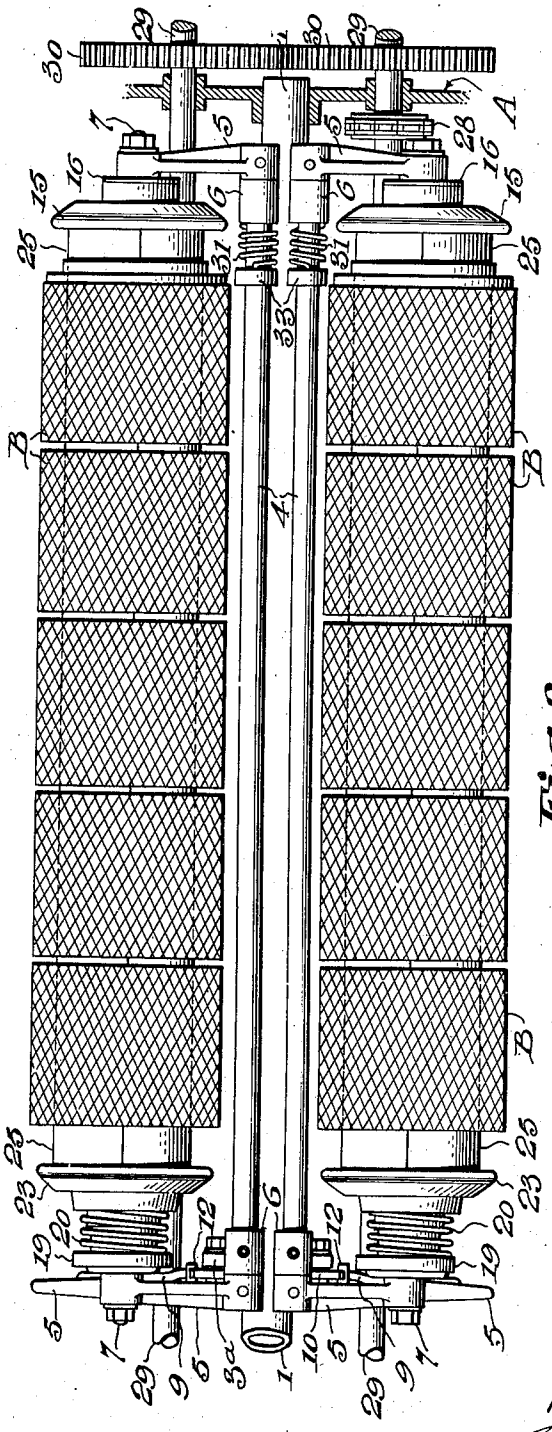


Fig. 1.

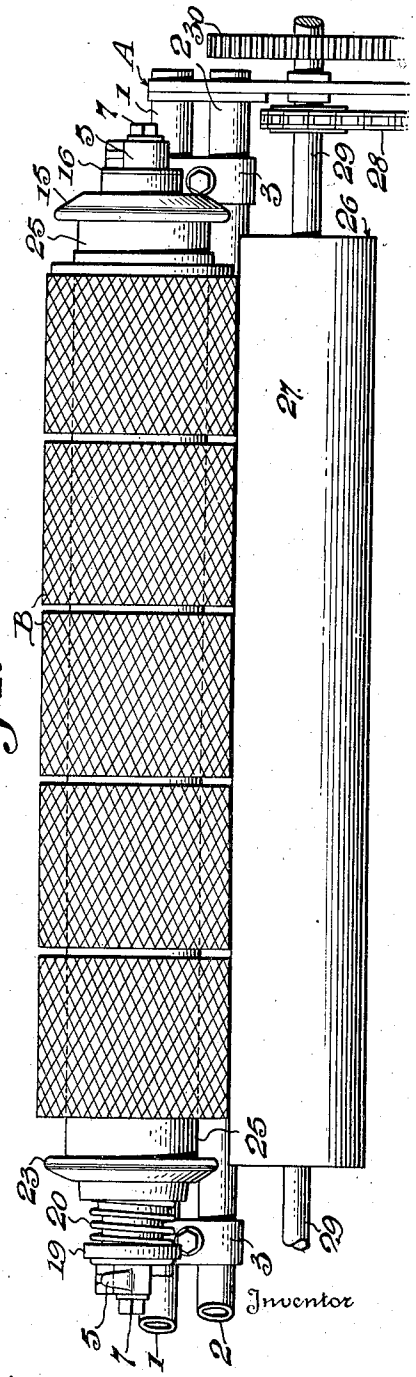


Fig. 2.

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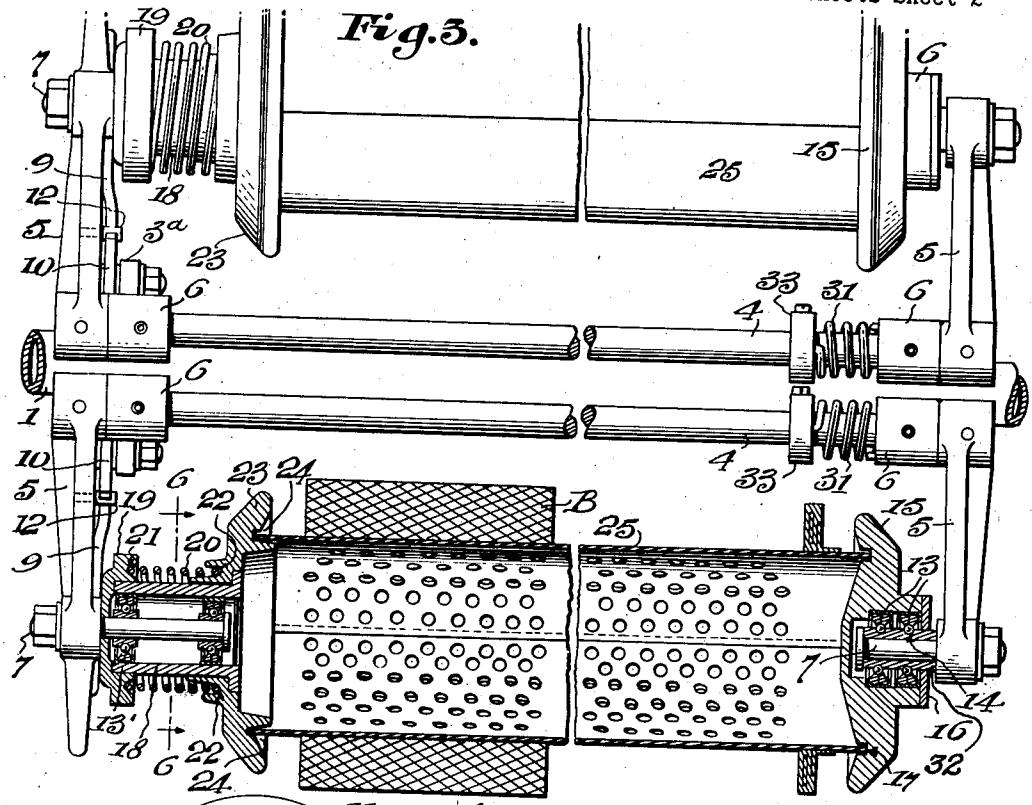
Attorney

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Fig.3.



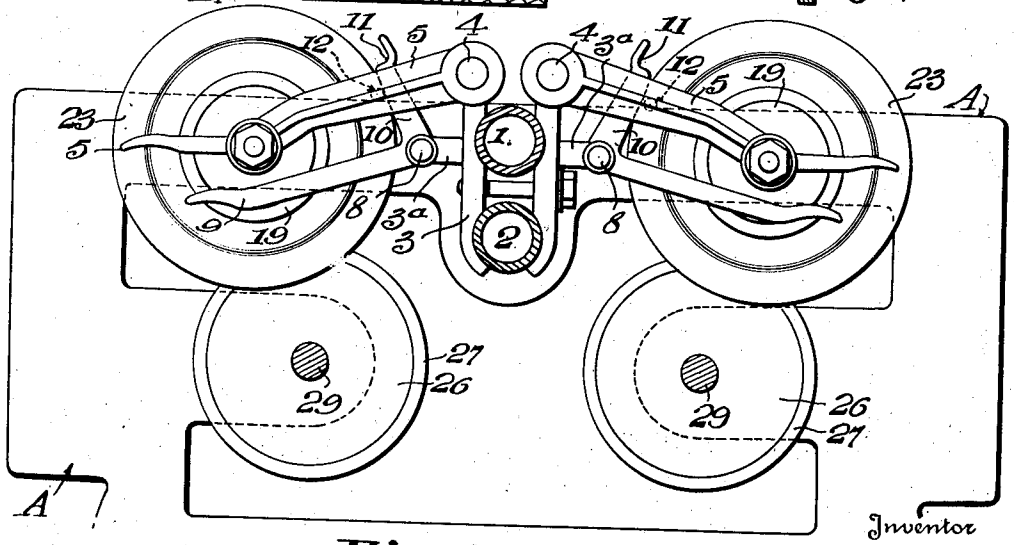


Fig.4.

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MULTIPLE YARN PACKAGE HOLDER

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Fig. 5.

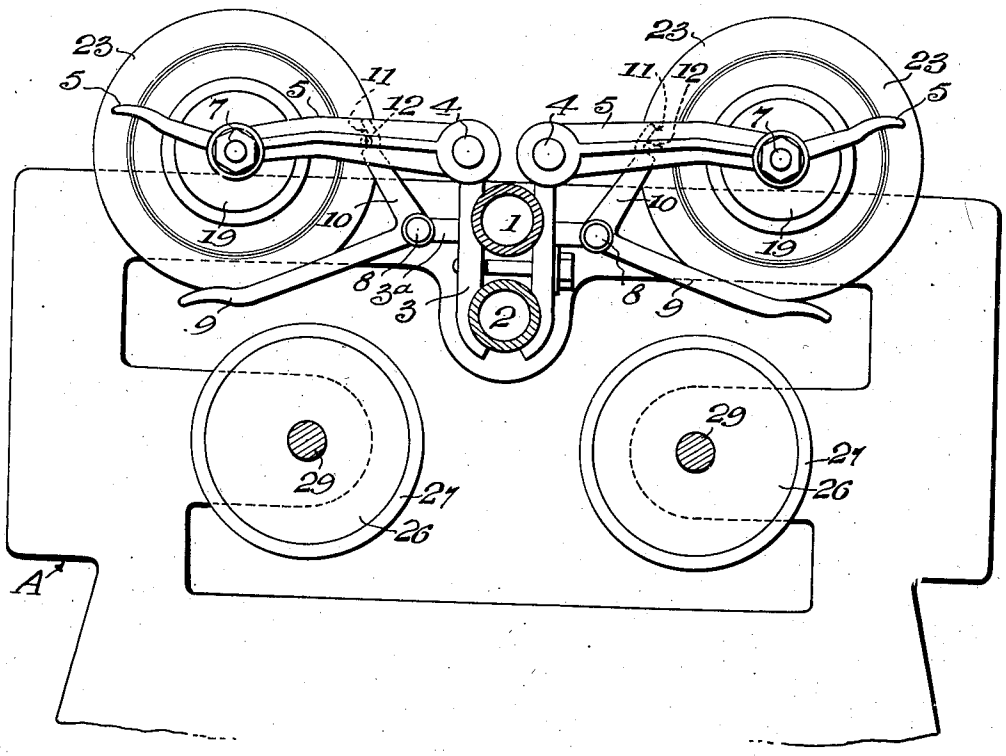
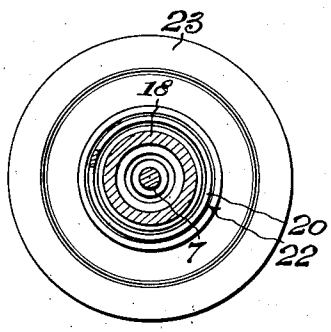


Fig. 6.



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UNITED STATES PATENT OFFICE

2,197,747

MULTIPLE YARN PACKAGE HOLDER

Herbert Naumann, Elizabethton, Tenn., assignor to North American Rayon Corporation, New York, N. Y., a corporation of Delaware

Application April 14, 1937, Serial No. 136,758

4 Claims. (Cl. 242—18)

This invention relates to a multiple yarn package unit and more particularly to an apparatus for winding a plurality of individual yarn or filament bodies upon a single tube.

An object of the invention is to provide an apparatus which will simultaneously build up a plurality of yarn bodies on a cylinder or tube enabling the several bodies to be handled as a unit during the steps of after-treatment or in subsequent processing.

A further object of the invention is to construct such an apparatus that the several individual yarn bodies will be built up simultaneously and uniformly on the winding cylinder or tube.

A still further object of the invention is the provision of a simple and novel means for supporting the unit while the bodies are being built thereon, with means to facilitate the insertion and removal of the unit from its driving connection and to hold the unit supporting means in elevated position for ready removal of the unit or insertion of a new cylinder.

These and other objects will become apparent from the following detailed description of the apparatus.

Referring to the drawings it will be seen that

Fig. 1 illustrates a top plan view of one complete section of the apparatus;

Fig. 2 is a side elevation of a complete section;

Fig. 3 is a top plan view showing one of the units partly in cross-section;

Fig. 4 is an end elevation illustrating the unit together with its driving connections;

Fig. 5 is a similar view as Fig. 4 showing the units elevated above the driving connections, and

Fig. 6 is an end cross-section taken on line 6—6 of Fig. 3.

As illustrative of the principles of the present invention, the drawings disclose one complete section of a machine which may be made up of any desired number of sections or units horizontally arranged on an elevated frame work. Extending throughout the length of the main frame A of the machine are two suitably supported vertically spaced parallel tubes or rods, 1 and 2. Each section or unit of the machine is hung or supported from these rods and each section includes a pair of spaced brackets 3 whose sides are contracted and held in close contact with the pipes 1 and 2 by means of bolts. At the upper ends of the sides of the brackets 3 and mounted on spaced parallel rods 4 are oppositely extending pivoted arms 5 apertured for the reception of headed bolts 7, the rods 4 passing through journals 6 formed in the upper ends of the brackets 3. It will be observed that each side of the section is identical and a duplicate of the other and it will, therefore, only be necessary to describe the mechanism of one side to comprehend the mechanism used on the other side.

Outwardly extending lugs 3a are formed on opposite side portions of the brackets 3 and are horizontally apertured to receive pivot shafts 8 on which are hung bell-crank levers 9. These levers 9 normally lie below and parallel to upper levers 5 throughout the major portion of their length, and the levers 9 are provided with off-set crank portions 10 extending upwardly where they terminate in a step or latch 11, as will be explained hereinafter. The step or latch 11 cooperates with a pin 12 placed on the inside of the lever arms 5 to hold the same in elevated position when the parts cooperate. The headed bolts 7 passing through the levers 5 extend inwardly toward one another and form in effect, a pair of stub axles. Referring specifically to the right hand portion of the section, see Fig. 3, it will be noted that a pair of ball bearings 13 cooperate with grooves 14 formed in a ring member 32 supported on the shank of bolt 7 and that these bearings in turn support a circular disc 15 held for rotation therewith by means of end cap 16. A circular groove 17 is formed on the inner face of the disc 15 for the purpose of supporting the end of a winding roll or tube as hereinafter described.

Referring now to the left hand portion of the unit illustrated in Fig. 3, it will be seen that here the shank of the bolt 7 while slightly longer than the bolt on the right hand section also acts as a stub axle. A pair of slightly spaced apart ball bearings 13' are mounted on the shaft portion of the bolt interiorly of flanged bushing 18 and an end plate 19 is secured to the outer end of the bushing and rotates therewith. The ends of the coil spring 20 encircling the bushing 18 rest in grooves 21 and 22 formed in the plate 19 and disk 23. This disk 23 is mounted exteriorly of the bushing 18 and is adapted for sliding movement therealong against the tension of the spring 20. The inner face of the disc 23 is provided with an annular groove 24 similar to groove 17 in opposite disc 15 for supporting therebetween a perforated expanding winding cylinder or tube 25. This winding tube 25 may be of any suitable construction as long as it exerts a slight outward expanding tension, and in the form illustrated comprises a split metallic cylinder having slightly overlapping edges.

Also carried by the main machine frame A are pairs of driven live rolls 26 having friction surfaces 27 for driving contact with the cylinders 25 and the yarn bodies built up thereon. These live rolls are driven by any suitable power means such as a chain and sprocket 28 mechanism to transmit power to the shafts 29 connected together by means of gearing 30.

The apparatus thus described is of great value in winding a multiple package of individual yarn

filament or thread bodies and finds its application in textile winding machines although it is of particular value in the artificial silk industry. Here, delicate filament or thread bodies are wound on individual perforated contractible spools, and while still on the spools are after-treated in various chemical and washing baths after which the yarn is dried and removed from the holders. It has been found that any manual handling of artificial silk bodies is most detrimental to them, and as each individual package or body must be separately handled for each of the several steps a large amount of material is thus damaged. With the present invention it is possible to wind a plurality of uniform packages or bodies on a single perforated tube and the whole handled as a unit and thus minimize spoiling of the delicate filaments.

As before described the tube or cylinder on which the several packages are built up is constructed to exert a slight outward tension on the package to insure that the package will hold its form and not be allowed to unravel or become loose. The use of such a contractible tube or cylinder also compensates for any subsequent shrinkage of the package. The apparatus as herein disclosed, not only permits the simultaneous winding of a plurality of uniform bodies on a single tube but also permits the tube to be readily inserted in or taken from the apparatus. It will be observed that when it is desired to wind a plurality of yarn packages B a cylinder 25 may be quickly and easily inserted in the machine by pressing laterally the movable end disc 23, and after centering the opposite end of the tube in the groove in the disc 15, the disc 23 is fitted over the opposite end of the cylinder and thus retained in position through the medium of the tension of the spring 20. When tubes are inserted in the machine the levers 5 and 9 are in elevated position as shown in Fig. 5, the bell-crank lever 9 having dropped downwardly of its own weight and the pin 12, carried on lever 5 has engaged the latch or step 11. The new tube to be wound may then be placed in driving connection with the driving rolls 26 by merely raising the end or handle of the lever 9 to cause the latch 11 to disengage the pin 12 and allow the tube to drop downwardly until it contacts the drive roll. Conversely, when a tube is full of yarn bodies B and it is desired to remove the unit, the operator elevates the end or handle of the lever 5 to cause the bell-crank 9 to pivot downwardly of its own weight and engage the latch and pin mechanism, whereupon the disc 23 is pressed outwardly and the entire unit carrying its several yarn bodies B is readily removed. The manipulation of the device is greatly facilitated by reason of the close proximity at the outer face of the machine of the handle provided on the lever 5 which is operated to disengage the winding tube from the drive roll and of the handle provided on the lever 9 which is operated to disengage the locking means and allow the winding tube to move into contact with the drive roll.

To insure that the cylinders 25 and the yarn bodies being built up thereon will rest against the drive rolls at the proper driving tension, a coil spring 31 is positioned around the rods 4 to which the levers 5 are secured. The springs 31 affixed between stops 33 and journals 6 rotate with the rods 4 and levers 5 and thereby proper tension is secured by adjustment of stops 33.

While I have described my improvements in great detail and with respect to preferred forms thereof, I do not desire to be limited to such details or forms since many modifications and changes may be made and the invention embodied in widely different forms without departing from the spirit and scope thereof, in its broader aspects. Hence I desire to cover all modifications and forms coming within the language or scope of any one or more of the appended claims.

I claim:

1. In winding machines, a supporting frame, spaced levers pivotally mounted on said frame one of said levers having a handle extending outwardly of the frame, rotatable discs mounted on said levers, a detachable winding member held between said rotatable discs, a drive roll mounted beneath and parallel to said winding member, resilient means normally urging said winding member into contact with said drive roll and locking means on said frame for engagement with said levers for positively holding said winding member out of contact with said drive roll said locking means including an operating lever extending outwardly of the frame in proximity to the handle on one of the spaced levers.

2. A yarn winding machine comprising, a frame; a pair of parallel levers pivotally mounted at their inner ends upon said frame, one of said levers having a handle at its outer end; a winding member detachably and pivotally mounted between said levers; a driving roll mounted beneath and parallel to said winding member; and locking means for positively holding the winding member out of contact with the driving roll, said locking means including a freely pivoted bell crank, the operating arm of said bell crank extending outwardly of the frame in proximity to the handle on the lever aforesaid.

3. A yarn winding machine comprising, a frame; a pair of parallel levers pivotally mounted at their inner ends upon said frame, one of said levers having a handle at its outer end; a winding member detachably and pivotally mounted between said levers; a driving roll mounted beneath and parallel to said winding member; and locking means for positively holding the winding member out of contact with the driving roll, said locking means including a bell crank pivotally connected to the frame below the lever having a handle and detent means on the lever having the handle, one arm of the bell crank being disposed to engage the detent means when the winding member is moved away from the driving roll, and the other arm thereof extending outwardly of the frame in operative proximity to the above-mentioned handle.

4. A yarn winding machine comprising, a frame; a pair of spaced levers pivotally mounted at their inner ends upon said frame, one of said levers having a handle at its outer end; a winding member detachably and pivotally mounted between said levers; a driving roll mounted beneath and parallel to said winding member; and locking means for positively holding the winding member out of contact with the driving roll, said locking means including detent means on the lever having the handle and a freely pivoted bell crank having unequal arms, the larger of which extends outwardly of the frame in operative proximity to the handle on one of the spaced levers, the smaller of which rests slidingly against the said detent means.

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