This invention relates to textile processing machines, and more particularly to a novel and improved supporting means for the lap roll of a cotton lap winding machine.

The main object of the invention is to provide a novel and improved lap roll supporting means for use on a lap winding machine to support the lap roll resulting from the processing of cotton fibers, the device of the present invention eliminating the use of lap pins, providing a conventional type of lap roll for transfer from the lap machine onto the comber, to which the lap roll must be delivered for the combing process, and eliminating the need for a workman to watch the unrolling lap of cotton during the combing process in order to be ready to take the lap pin out of the comber before it drops into the machine or runs off of the machine.

A further object of the invention is to provide an improved support for a lap of cotton in a lap winding machine, said support involving inexpensive components, being durable in construction, being relatively compact in size, being easy to operate, and requiring a minimum amount of maintenance.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a top plan view, partly in horizontal cross section, of an improved lap roll supporting mechanism constructed in accordance with the present invention, with the shaft elements thereof shown in abutting relationship, whereby said shaft elements are adapted to support a cotton lap for winding thereon.

Figure 2 is a top plan view of the lap roll supporting mechanism of Figure 1 with the shaft elements thereof shown in retracted positions, whereby a lap roll previously wound thereon may be readily removed.

Figure 3 is a transverse vertical cross sectional view taken on the line 3—3 of Figure 1.

Figure 4 is a transverse vertical cross sectional view taken on the line 4—4 of Figure 2.

Figure 5 is an enlarged side elevational view of the left half of the assembly shown in Figure 1 with the associated shaft segment shown in fragmentary view.

In a conventional lap winder of the prior art, the lap of cotton which comes from the lap machine is substantially a wide ribbon of cotton resulting from the processing in the lap machine of a number of different sets of roping of cotton fibers. These cotton fibers are arranged by the lap machine in such a manner that they become a wide ribbon of cotton of the order of nine or ten inches in width, depending upon the width of the lap machine. The resulting roll of cotton is called a "lap." The machine which winds the fibers into this position is called a "lap winder." From the lap winder the roll of cotton is taken to the comber and is put through the combing process. In the lap winder of the prior art the ribbon of cotton is wound upon a wooden shaft which runs all the way through the roll. In the combing process it is necessary for a workman to watch the unrolling lap of cotton in order to be ready to take the wooden shaft out of the comber before it drops into the machine or runs off the machine. This necessitates the use of a large number of these wooden shafts, which are called "lap pins."

The present invention has for a prime purpose the elimination of the "lap pins" and at the same time the provision of a conventional type of roll for transfer from the lap machine onto the combers.

In the existing prior art lap machines, the wooden pin is inserted onto two pintles, one on either side, which are in the center of a disc. These pintles are so arranged that there is pressure against the wooden lap pin to hold it in place and in proper running position between the two discs so that it is in a position to receive the sliver of cotton.

The device of the present invention provides a roller upon which the cotton sliver or lap is rolled, and furthermore provides means for removing the center pin or shaft elements about which the roll of sliver is run and means to doffing the machine and transferring the new roll of sliver to the combers.

Referring to the drawings, 11 generally designates the frame of a lap winding machine, and 12, 12 designate a pair of longitudinal frame members to which are secured the respective axially aligned conventional cylindrical housings 13, 13'. Designated at 14, 14' are opposing circular disc members which are mounted on the ends of respective sleeves 15, 15' rotationally mounted in the cylindrical housings 13, 13', being journaled thereto, as by the provision of suitable, spaced ball bearing units 16, 16 in each of the housings, as shown in Figure 1. Spacer rings 17 are provided in the housings between the respective pairs of ball bearing units 16, 16, as shown in Figure 1. Secured to the outer ends of the sleeves 15 and 15' are suitable thrust disc members 18, cooperating with enlarged thrust flanges formed on the inner ends of the sleeves to resist endwise thrust developing between the sleeves and the housing members 13, 13'.

Housings 13, 13' are formed with thrust flanges 39, 39', and thrust bearing balls 40, 40' are provided between the thrust flanges and the adjacent disc members 14 and 14', being positioned in suitable raceway grooves formed in the thrust flanges and disc members.

Secured to the opposite side portions of the respective cylindrical housings 13, 13' are the respective pairs of outwardly extending, opposing arms 19, 19', 19, 19, and pivotable between the outer end portions of said pairs of arms are the respective fluid pressure cylinders 21 and 21'. Designated at 22 and 22' are respective fluted shaft segments which are slidable mounted in the respective sleeves 15 and 15' and which are movable into endwise abutting relationship, whereby to define a supporting shaft for a lap roll, the segment 22' being formed at its end with a conical boss 23 and the shaft segment 22 being formed at its end with a correspondingly shaped conical recess 24 adapted to receive the boss 23 when the shaft segments 22 and 22' are in their extended abutting relationship, shown in Figure 1, and acting to positively maintain the shaft segments in axial alignment when they are in said extended abutting relationship.

Secured to the outer ends of the shaft segments 22 and 22' are the respective disc members 25 and 25'. The piston rods associated with the fluid pressure cylinders 21 and 21' are designated respectively at 26 and 26', said piston rods being connected to the respective pistons in the cylinders and extending axially therefrom, the piston rods being axially aligned with the respective shaft segments 22 and 22'.

Secured to the end of each piston rod is a socket member, the socket members being shown respectively at 27 and 27', said socket members being
adapted to rotatably receive the respective disc members 25 and 25'. As shown in Figures 1, 2 and 4, the socket members are provided at their edges with diametrically opposed pairs of retaining lugs 28, 28', 28' which engage around diametrically opposed portions of the peripheries of the respective disc members 25 and 25', whereby to connect the piston rods 26 and 26' to the respective shaft segments 22 and 22' for axial movement therewith. Bearing balls 29 are provided in recesses in the disc members 25 and 25', said bearing balls centrally engaging the respective socket members 27 and 27' to allow free rotation of the shaft segments 22 and 22' around their axes relative to their associated socket members 27 and 27'.

The fluid pressure cylinders 21 and 21' are controlled by conventional means, not shown, whereby fluid may be at times admitted into the outer end of each cylinder, simultaneously being exhausted from the inner end thereof, whereby to extend the shaft segments 22 and 22' to the positions thereof shown in Figure 1. When the shaft segments 22 and 22' are in their abutting positions, shown in Figure 1, said shaft segments may be employed to support a lap roll as it is wound and as it receives the cotton sliver thereon. When the roll of cotton is to be removed and transferred to the combers, the fluid pressure cylinders 21 and 21' are operated to retract their piston rods 26 and 26', whereby the shaft segments 22 and 22' are retracted into their sleeves 15 and 15', freeing the lap roll for removal.

It will be understood that any suitable fluid may be employed in the cylinders 21 and 21', such as air, liquid, or any other fluid conventionally employed in cylinders.

While a specific embodiment of an improved lap roll support for a lap winding machine has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. In a lap winding machine, a frame, a pair of spaced parallel opposing support members adapted to receive a lap roll therebetween, respective sleeve members rotatably mounted on said support members in axially alignment, respective shaft segments slidably mounted in said sleeve members and being of sufficient length to be movable toward each other into endwise abutting relation, whereby to at times define a supporting shaft for a lap roll, one of said shaft segments being formed with a conical axial recess in its inner end, a conical boss on the inner end of the other shaft segment receivable in said recess, respective fluid pressure cylinders mounted on the support members outwardly of and in axial alignment with said shaft segments, respective pistons in said cylinders, respective axially extending piston rods connected to said pistons, respective enlarged disc members secured to the outer ends of the shaft segments, respective socket members secured to the ends of the piston rods and rotatably receiving said disc members, and inwardly extending retaining lugs on the edges of said socket members, said lugs engaging around the peripheries of the disc members, whereby to connect said piston rods to the outer ends of said shaft segments and being formed and arranged to at times axially retract said shaft segments, whereby to release the lap roll.

2. In a lap winding machine, a frame, a pair of spaced parallel opposing support members adapted to receive a lap roll therebetween, respective sleeve members rotatably mounted on said support members in axial alignment, respective shaft segments slidably mounted in said sleeve members and being of sufficient length to be movable into endwise abutting relation, whereby to at times define a supporting shaft for a lap roll, one of said shaft segments being formed with a recess in its inner end, a boss on the inner end of the other shaft segment rotatably receivable in said recess, and respective fluid pressure-operated means rotatably connected to the outer ends of said shaft segments and being formed and arranged to at times axially retract said shaft elements, whereby to release the lap roll.

3. In a lap winding machine, a frame, a pair of spaced parallel opposing support members adapted to receive a lap roll therebetween, respective sleeve members rotatably mounted on said support members in axial alignment, respective shaft segments slidably mounted in said sleeve members and being of sufficient length to be movable towards each other into endwise abutting relation, whereby to at times define a supporting shaft for a lap roll, one of said shaft segments being formed with a recess in its inner end, a boss on the inner end of the other shaft segment rotatably receivable in said recess, respective fluid pressure cylinders mounted on the support members outwardly of and in axial alignment with said shaft segments, respective pistons in said cylinders, and means rotatably connecting said pistons to the outer ends of said shaft segments and being formed and arranged to at times axially retract said shaft segments, whereby to release the lap roll.

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