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J. A. HEANY

WINDING MACHINE

Filed April 17, 1925

Fig. 2.

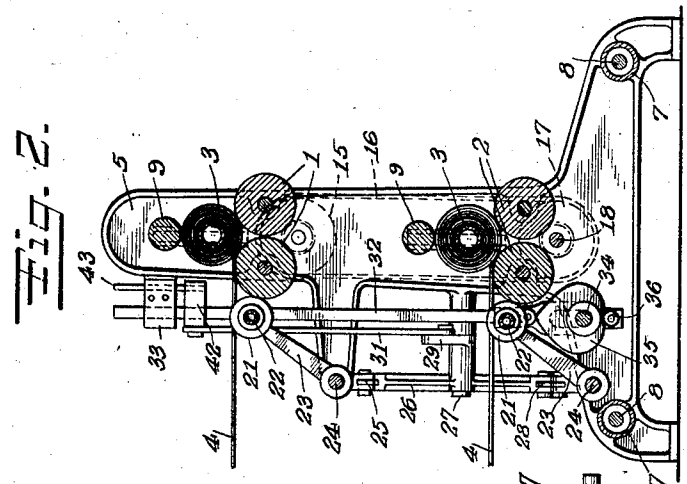


Fig. 1.

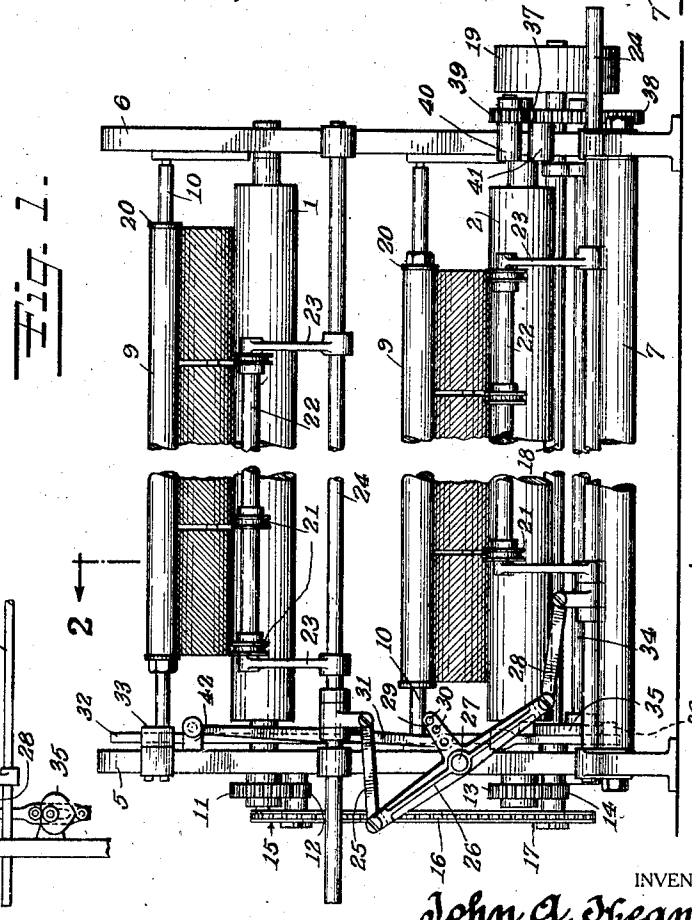
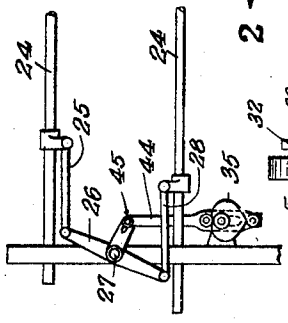


Fig. 3.



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UNITED STATES PATENT OFFICE.

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WINDING MACHINE.

Application filed April 17, 1925. Serial No. 23,760.

This invention relates to winding machines and traverse mechanism therefor, and more particularly to machines adapted for winding strands of textile material.

In order to utilize suitable fibres for preparation of yarns or the like for use in weaving, knitting, and other kinds of manufacture, it is necessary to subject the fibres to a series of operations to form slivers, rovings, yarns and the like. For example, in the manufacture of cotton yarn, such steps are, starting with cotton in the bale; (1) opening and picking; (2) carding and combing; (3) drawing; (4) roving and (5) spinning. After the baled cotton has been separated and cleaned to some extent in the first operation, it is subjected to the carding operation in which the fibres are straightened, formed into a thin, evenly divided film, passed by calender rollers through a trumpet in a round strip called a sliver, and the sliver is automatically coiled in a sliver can by a coiler.

In different steps of the process, the mass of cotton is doubled, that is, a plurality of strands are combined, and then is reduced in size by drawing it out to several times its original length until the yarn is really produced. This operation tends to straighten the fibres and bring them into nearly parallel positions. In the drawing operation, several slivers are combined, drawn out, pulled through a trumpet, and coiled in a can, this operation being repeated as many times as required.

The cans of sliver are then placed behind the first of the roving machines which, besides rolls similar to the drawing frames, have spindles by which the stock, then called roving, is twisted and wound on bobbins. The full bobbins of roving from the first frame or slubber are placed in the creel of the intermediate frame, certain strands are combined, drawn and substantially in one operation twisted and wound on a bobbin. A similar operation is carried on in the frame. Further twisting of the rovings is effected in the spinning operation.

An important object of the present invention is to provide novel and improved mechanism for readily and efficiently winding or reuniting the yarn prepared from the rovings as above specified.

A further object is to provide novel and improved traverse mechanism for guiding the strands to the objects on which the strands are wound.

Further objects relating to means for maintaining the yarn rolls taut and for facilitating uniformity in the winding and relating to details of construction will appear from consideration of the following detailed description and of the accompanying drawing in which

Figure 1 is a view in elevation of an approved embodiment of the invention;

Figure 2 is a sectional view taken along the line 2—2 of Figure 1; and

Figure 3 is a view of another form of means for traversing the yarn guide.

For convenience, the term "strand" will be used throughout the specification to include rovings, yarns or strands formed at other stages in the manufacture of spun yarns.

In the illustrated embodiment of the invention, provision is made of a plurality of pairs of rollers, one pair above another, to support and drive tubes on which the strands are to be wound, the tubes being held against the driving rollers of each pair by rollers of substantial weight which also serve to compress the material wound on the tubes. The strands are presented to the tubes of each set by grooved members in the form of rollers traversed back and forth between the ends of the tubes. Such grooved members are for each set of tubes, mounted on a rod or member supported by arms on a rail or shaft mounted for longitudinal sliding movement parallel to the axes of the driving rollers. The longitudinally movable shafts of the illustrated embodiment of the invention are connected by links to the opposite ends of a lever pivoted at its middle on a fixed part of the machine. Projecting transversely from this lever is an arm adjustably connected with the lower end of a link whose upper end is pivoted to a vertically reciprocable slide actuated by a heart cam.

It should be understood that the traverse mechanism herein disclosed is adapted for use in actuating more than two of such longitudinally movable rails.

As herein disclosed, the machine comprises upper and lower pairs of rollers 1 and 2, respectively, to turn tubes 3 and wind thereon strands 4 of the material to be

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handled. The rollers 1 and 2 are journalled in end frames 5 and 6 connected, for example, by spacing tubes 7 and rods 8 passing through said tubes 7 and having threaded ends to receive suitable nuts.

Above each pair of rollers 1 and 2 is a presser roll 9 of substantial weight mounted on a shaft 10 which is slidably mounted at its ends in the end frames. Such rolls 9 are lifted when the tubes are to be placed on the pairs of winding rollers and also when the tubes are to be removed, and during the winding operation serve to hold the tubes 3 on the winding rollers and to compact the stock wound on the tubes.

To turn the rollers 1 and 2, provision is made at the left of the machine, as seen in Figure 1, of gears 11 mounted on the shafts of the rollers 1 and meshing with a gear 12 and of gears 13 mounted on the shafts of the rollers 2 and meshing with a gear 14. The gear 12 is fixed to a sprocket wheel 15 which is connected by a chain 16 with a sprocket wheel 17 of the same size as wheel 15 and on a shaft 18 which also carries the gear 14 and turns the same. The shaft 18, which may be considered the main shaft of the machine, is journalled in the end frames 5 and 6 and may be driven by a pulley 19 fixed thereon at the right of the machine as seen in Figure 1.

As herein disclosed, a plurality of tubes are placed end to end on the pairs of winding rollers 1 and 2 and are to some extent held in position longitudinally thereof by means of flanges 20 at the ends of the presser rollers 9 to engage the outer ends of the end tubes as the material is wound thereon. In winding the strands 4 on the tubes 3, it is necessary to provide traverse mechanism to guide the strands to the tubes 3 so that the packages of strands 4 will be built up in the proper manner. To this end, provision is made of a plurality of guide members 21 in the form of grooved rollers mounted on a rod 22 carried by arms 23 fixed on a shaft or rail 24 slidably mounted on the end frames 5. As indicated in Fig. 2, the guide members 21 of the two sets may rest on the adjacent winding rollers 1 and 2, respectively.

To reciprocate the rails 24, the upper one thereof is connected by a link 25 to one arm of a lever 26 centrally mounted on a pivot 27 and the lower rail 24 is connected by a link 28 with the other end of lever 26. For driving purposes, the lever 26 is provided with an arm 29 perpendicular to the main portion of the lever and provided with a series of openings 30 to receive a pivot to connect the same with one end of a link 31 connected at the other end with a member or bar 32 reciprocable in a guide 33. It will be evident that by changing the connection between the arm 29 and the link 31 the extent of movement of the guide members 21 may be varied without varying the movement of the reciprocable member 32.

To reciprocate the member 32, use is made of a shaft 34 journalled in the end frames 5 and passing through the slotted lower end of the member 32 to assist in guiding the same. Fixed on the shaft 34 is a heart cam 35 which engages cam followers or rollers 36 on the member 32 and actuates the latter. Actuation of the shaft 34 may be effected by means of a gear 37 on the right hand end (Figure 1) of the shaft of the front roller 2, a gear 38 on the right hand end of shaft 34 and an idler gear 39 meshing with both of said gears 37 and 38. It should be understood that provision may be made for using gears of other sizes instead of gears 37 and 38 and of a suitable idler gear to cooperate therewith. As shown in Figure 2, there is a bracket 40, in which the idler gear 39 is supported, and an unused bracket 41 which might be used to support an idler cooperating with gears substituted for 37 and 38.

As shown most clearly in Figure 2, the link 31 is connected with the reciprocable member 32 by a member 42 and to assist in securing proper action of the parts, the member 42 is provided with an upwardly extending bar 43 slidable in guide 33.

According to a modified form of the invention, the connection between the heart cam 35 and the lever 26 may be effected by means of member 44 actuable by the heart cam in the same manner as bar 32 but connected directly with the arm 29 by a pin and slot connection 45.

It will be seen that the traverse mechanism is so arranged that uniformity of winding on all of the tubes will be obtained and that the number of winding devices placed one above another may be increased as desired.

While I have disclosed herein preferred means for carrying out my invention, I wish it to be understood that I do not limit myself to the structure herein disclosed and that various modifications and variations may be used without departing from the spirit of my invention.

Having thus described my invention, I claim:

1. In a machine of the class described, the combination with a plurality of winding devices, each comprising a pair of rollers adapted to carry the devices on which the material is to be wound, gears on the shafts of said rollers to rotate the same, a driving gear meshing with the gears of each pair of rollers, and means connecting said driving gears to cause them to rotate in unison.

2. In a machine of the class described, the combination with a plurality of winding devices, each comprising a pair of rollers

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adapted to carry the devices on which the material is to be wound, gears on the shafts of said rollers to rotate the same, a driving gear meshing with the gears of each pair of rollers, and means connecting said driving gears to cause them to rotate in unison, comprising sprocket wheels fixed to said driving gears and a chain extending around said sprocket wheels.

3. In a machine of the class described, the combination with a plurality of winding devices, of traverse mechanism comprising a strand guide for each device, and means for simultaneously moving the strand guides of adjacent winding devices in opposite directions, including a lever, devices connecting opposite arms of said lever with said strand guides, a reciprocable member, a link to connect said reciprocable member with said lever, and means to hold said reciprocable member against turning about its axis.

4. In a machine of the class described, the combination with a plurality of winding devices, of traverse mechanism comprising a strand guide for each winding device, and means for simultaneously moving the strand guides of adjacent winding devices in opposite directions including a centrally pivoted lever connected at opposite ends with such strand guides, a longitudinally reciprocable member, a cam for actuating said member, a block fixed on said member, a link pivoted to said block and to said lever to connect the same, and guiding means for said block.

5. In a machine of the class described, the combination with a plurality of winding devices, of traverse mechanism including a strand guide for each winding device, and means for simultaneously moving the strand guides of adjacent winding devices in opposite directions including a centrally pivoted lever connected at opposite ends with said strand guides, a longitudinally reciprocable member, a block secured on said reciprocable member, a link pivoted to said lever and to said block at one side of said reciprocable member, guiding means for said reciprocable member, and guiding means for said block at the side of the reciprocable member opposite to that at which the link is pivotally connected with the block.

6. In a winding machine, a plurality of winding rollers arranged in sets, one set above another, and adapted to support and rotate one or more tubes placed end to end thereon, and traverse mechanism including a rail associated with each of said sets of rollers and reciprocable parallel to the axes of said rollers, grooved guiding rollers connected with said rails and resting on certain of said winding rollers, and means to reciprocate adjoining rails in opposite directions.

In testimony whereof, I affix my signature.

JOHN ALLEN HEANY.

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