

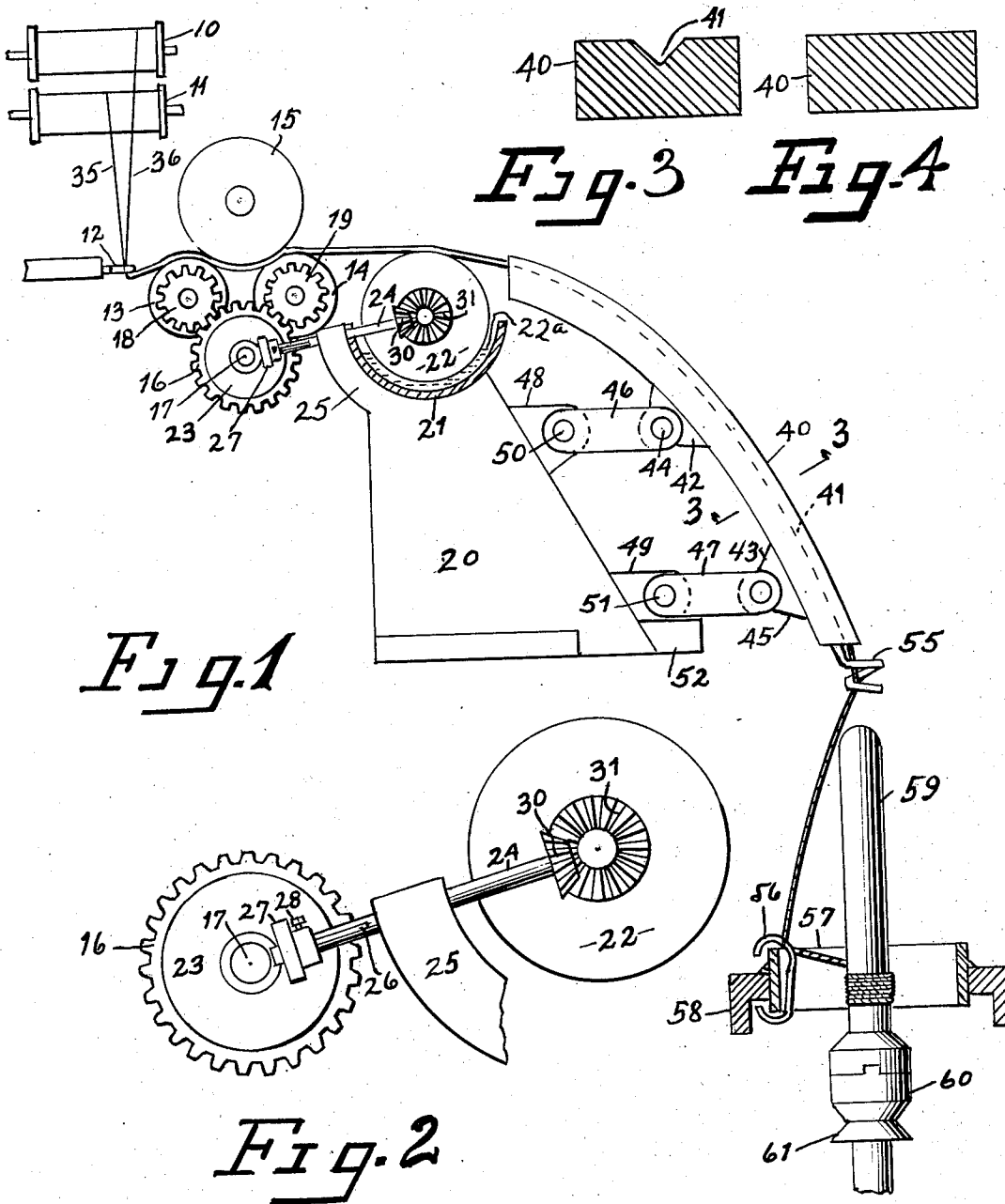
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MEANS FOR PROCESSING YARN

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MEANS FOR PROCESSING YARN

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This invention relates to an improved apparatus for twisting of yarn and applying a treating solution such as water, which may have admixed therewith a penetrating agent, if desired, and twisting the yarn while wet and subjecting the yarn to a rubbing action to smooth the fuzz and outstanding fibers thereon and to present a finished yarn which to all intent purposes will have the appearance of singed yarn.

It is an object of this invention to provide an apparatus for twisting yarn in which the yarn is brought from the conventional weighted feeding rolls and is passed over a moistening roll which applies moisture thereto, and then bringing the yarn over a surface where the yarn will not only be rubbed, but will be partially twisted on this surface, and this twisting or rotation of the yarn while passing over this surface will move the fibers and cause them to become embedded in the yarn as it is being twisted.

It is a well known fact that cotton yarns have certain natural oils therein which when moistened, permit the fibers of the yarn to stick together and cause the outstanding fibers from the yarn when pressed in the yarn to adhere to the body of the yarn, and thus will remain in this position when twisted, or otherwise treated after this smoothing operation.

It is another object of this invention to provide a method and apparatus for twisting yarn and applying a moistening agent to the yarn prior to twisting, and then passing the yarn on its way to the bobbin over a smoothing surface which will smooth the outstanding fibers in the yarn both longitudinally and transversely of the yarn for the reason that the rubbing action of the board or other member over which the yarn is passed will smooth the fibers and the twisting action imparted to the yarn by the rotation of the bobbin will turn the yarn, or rotate the yarn on the smoothing board, thus will cause the fibers to be pressed into the yarn to thereby present a very smooth appearance to the yarn after it is twisted.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawing, in which:

Figure 1 is an elevation, partly in section and partly shown in schematic form, showing my invention applied to a conventional twister frame;

Figure 2 is an enlarged elevation of the upper left-hand portion of Figure 1;

Figure 3 is a cross-sectional view taken along the line 3—3 in Figure 1;

Figure 4 is a cross-sectional view through the rubbing board, and showing a modified form of the board without the groove therein.

Referring more specifically to the drawing, the numerals 10 and 11 indicate a pair of bobbins in a twisting frame from which the yarn is passed through an eye member 12 and over rollers 13 and 14, and resting on top of the yarn as it passes over rollers 13 and 14 is a weighted roll 15. The rolls 13 and 14 are driven by any suitable means such as a pinion 16 mounted on shaft 17, which shaft is driven by any suitable means. The rollers 13 and 14 are driven by means of pinion 16 meshing with pinions 18 and 19 fixedly secured on the ends of rollers 13 and 14. The structure thus far described is conventional structure, and it is with this conventional structure that I have associated my invention.

Instead of the conventional thread board on the twister frame, I provide a stand 20, which has a trough 21 supported thereby, in which moistening liquid 22a is placed. The trough is shown in section, and has the end nearest the observer removed therefrom. Mounted for rotation in this trough is a suitable moisture applying roll 22, which is driven by any suitable means such as by providing the pinion 16 with a friction face 23 and mounting a shaft 24 in an upstanding lug 25 of the stand 20 and providing on the shaft 24 a key way 26, and on this shaft and key way, a friction wheel 27 is adjustably secured by any suitable means such as a set screw 28. The right-hand end of shaft 24, as viewed in Figures 1 and 2, has a beveled gear 30 thereon which is adapted to mesh with another beveled gear 31 on the end of the shaft supporting the roller 22. The roller 22, of course, is supported at its end in suitable bearings not shown. By adjusting the position of the friction wheel 27 along the shaft 24, the rate of rotation imparted to moisture applying roll 22 can be adjusted as desired.

The trough 21 is adapted to have therein any suitable treating liquid such as water, which may or may not be supplied with a penetrating agent to cause the moisture to be more rapidly applied to the yarn. A plurality of yarn ends 35 and 36 which are led from the bobbins 10 and 11 are shown as being two in number in the drawing, but any desired number can be twisted together as desired. The yarn is passed through an eye 12 and above the rollers 13 and 14 and beneath the weighted roller 15 which is pressing onto the surfaces of rollers 13 and 14, then it passes over the moistening roll 22, and is then led over a

pressing or ironing board 40. This pressing or ironing board may have, if desired, a suitable groove 41 therein, and may be curved to any desired degree to impart the proper friction to the yarn on its travel to the twister bobbin. The ironing board 40 is pivotally mounted on the stand 20, there being a board or member 40 for each twister bobbin. The pivotal mounting of the board 40 is for the purpose of allowing it to be raised up out of normal position while doffing and donning, so that it will not be in the way of the bobbin in doffing and donning the same. The board 40 has a pair of lugs 42 and 43 which are pivotally secured as at 44 and 45 to links 46 and 47, which links, in turn, are pivotally secured to lugs 48 and 49 extending from stand 20 by any suitable means such as pivots 50 and 51. The stand or support 20 is provided with a projection for each board or a continuous projection indicated by reference character 52, which limits the downward travel of the board 40 and associated parts. At the lower end of the board 40, there is provided a pig tail or eye member 55 through which yarn passes to a traveller 56 on a ring 57 disposed in conventional ring rail 58, and after passing beneath the traveller, it is wound around a bobbin 59 removably mounted on a spindle or bolster 60 which is driven by any suitable conventional means such as a conventional whorl 61 which has a belt therearound which also passes around and is driven by the conventional cylinder of the twister which is not shown.

As the plurality of strands of yarn are led through the apparatus to the bobbin 59, they are, of course, moistened by contact with the roller 22 which lifts moisture from the trough 21. As the yarns travel downwardly on the board 40, they are, of course, twisted by the action of the twisting operation on account of the rotation of the bobbin 59 which twists the yarn as it appears between the eye 55 and the traveller 56. This twisting will also extend upwardly in the trough 41. The twisting operation while the yarn is in contact with the board will rub the yarn by rotating the same on the board, and will thus embed the fibers radially into the yarn or rather spirally into the yarn as the yarn will be travelling down the board while it is being rotated, and thus the fibers will be impressed into the surface of the yarn, and the smoothing action or double ironing action will take place both by the longitudinal travel of the yarn and by the rotative action imparted thereto by the twisting operation. After the yarn is thus smoothed and twisted, it is deposited onto the twister bobbin 59 and in this smooth and twisted condition, and a moist condition as well, the fibers will be set in this condition and the result will be a very smooth yarn which will not have to be singed, as a general rule, and furthermore, the yarn will be treated with the moistening agent and thus will eliminate the necessity of package treating of the yarn, which is now carried out on yarn twisted in the conventional manner.

By applying the moisture to the yarn as it is twisted, the yarn will be twisted in this moist condition, and will be ready for working operation without the necessity of placing the packages of yarn in a moistening machine or conditioning machine, and passing the same therethrough prior to a working operation.

This apparatus is adaptable for spinning, as well as twisting. It is realized that though wet roving probably could not be spun satisfactorily, but if the amount of moisture applied to a roving

is regulated, to apply a small additional amount of moisture to the yarn, and since the roving does not have to pass through any drawing rolls after moisture is applied thereto, the roving can be spun by the apparatus shown, though it might be desirable to have a regular spinning ring and spinning traveller instead of the twister ring and twister traveller shown in the drawing. By regulating the speed at which the moisture applying roll is driven, it can be made to turn very slowly, if desired, to apply the desired amount of moisture to the roving.

All modern spinning and twisting mills at the present time are equipped with humidification apparatus, the purpose being to apply a certain amount of moisture to the yarn by the medium of the atmosphere of the mill, and by applying a small additional amount of moisture to the rovings, better spinning action can be obtained.

By the time the yarn, after it is spun, is ready to be twisted or plied, it has usually lost a good amount of its moisture, and in a twisting operation, the speed of the moisture applying roll would be increased to apply whatever amount of moisture would give the best results in twisting.

This apparatus can not only be used for applying moisture, but also any suitable agent such as mildew proofing, fire proofing, dyeing, waxing, glazing, waterproofing, oil treating, resin treating, softening, or any other desired treating agent.

By the use of this apparatus, it is evident that by applying moisture during spinning or twisting, the fluid will soften the natural gums in the fibers, and they will be more firmly set and embedded in the surface of the strands, and even the interior fibers will be bound together, so that a greater breaking strength is imparted to the yarn than would be otherwise the case.

In the drawing and specification, there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. In a twister frame having means for holding packages of yarn and tension rolls through which the yarn is passed and a bobbin ring rail and traveller for winding the yarn on the bobbin, means for applying a treating solution to the yarn after it leaves the tension rolls comprising a trough for holding the treating fluid, a roller mounted in the trough, the yarn being adapted to contact a portion of the roller which is not submerged in the treating fluid, means for driving the treating roller, means for varying the rate of rotation of the treating roller, an elongated trough member pivotally secured to the twister frame and extending for a portion of the distance between the treating roller and the bobbin and over which the strands of yarn are passed in frictional contact with the walls of the trough on its travel from the treating roller to the bobbin, said trough member being movable upwardly out of the way of the bobbin during doffing and donning operations.

2. In a spinning or twister frame having means for holding packages of yarn and tension rolls through which the yarn is passed and a bobbin ring rail and traveller for winding the yarn on the bobbin, means for applying a treating solution to the yarn after it leaves the tension rolls comprising a trough for holding the treating

fluid, a roller mounted in the trough, the yarn being adapted to contact a portion of the roller, which is not submerged in the treating fluid, means for driving the treating roller, means for varying the rate of rotation of the treating roller, an elongated trough member pivotally secured to the twister frame and extending for a portion of the distance between the treating roller and the

5 bobbin and having a trough extending longitudinally thereof and through which the strands of yarn are passed in frictional contact with the walls of the trough on its travel from the treating roller to the bobbin, said trough member being movable upwardly out of the way of the bobbin during doffing and donning operations.

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