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J. B. JOHNSON ET AL

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APPARATUS FOR APPLYING LUBRICANTS TO YARN

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FIG. 1.

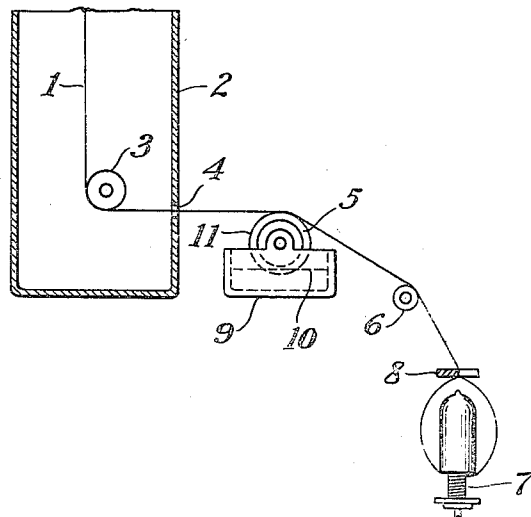


FIG. 2.

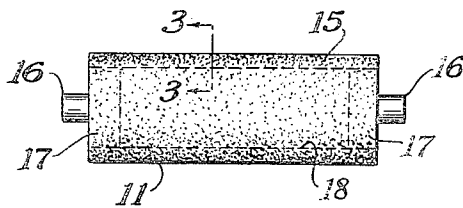
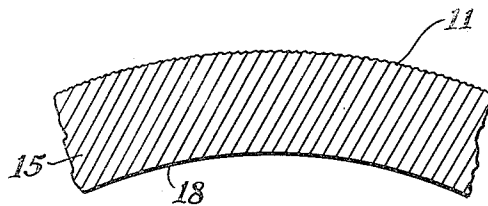


FIG. 3.



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APPARATUS FOR APPLYING LUBRICANTS TO YARN

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1 Claim. (Cl. 91—51)

This invention relates to apparatus for processing textile yarns and particularly to apparatus for applying lubricants, emulsions of oil, tinting oils, etc., to yarns by means of a rotating roller. One object of our invention is to provide a simple lubricant applying roller, the metallic surface of which will convey the proper amount of lubricant to yarn passing over the surface of the roller. Another object of our invention is to provide a roller having a surface slightly deformed from a normal cylindrical shape by means of minute unpolished irregularities in the surface of the cylinder, these irregularities being adapted to convey a uniform quantity of lubricant to yarn passing over the roller. Still other objects will appear from the following specification, the novel features being particularly pointed out in the claim at the end thereof.

It is common practice to apply lubricants, such as emulsions of oil, tinting oils, etc., to yarn in transit by means of rotating rollers. Such rollers may dip into troughs containing the lubricant, emulsion, tinting oil, or the like, to be applied to the yarn and the rollers convey such material to the yarn. It has been difficult to convey sufficient lubricant to the yarn with the usual smooth surfaced roller and it has been common practice to place stockings or tubes of fabric over the roller to absorb and obtain sufficient liquid from the trough bringing the yarn into contact with the fabric. This has caused troublesome defects in the yarn, since the fabric seems to cause the yarn to break and become fuzzy and the fabric does not apply a uniform quantity of the lubricant to the yarn.

As the yarn is quite delicate at the point where lubricants are ordinarily applied, the rollers in use have been provided with smooth or polished surfaces since it has been thought that such a surface would be necessary to prevent damaging the yarn.

We have found, however, that a metallic roller can be used satisfactorily for applying lubricants directly to the yarn thus eliminating the troublesome fabric coverings, which have the defects above mentioned and eliminating the defects due to using the known type of smooth surfaced rollers—that of conveying insufficient lubricant to the yarn.

We have substituted for the usual smooth surface of the roller a surface in which the usual cylindrical shape has been slightly deformed by means of a plurality of minute unpolished irregularities in the surface, these ir-

regularities being sufficiently smooth to contact with the yarn without damaging it and being sufficiently rough to cause a larger quantity of emulsions to cling to its surface and to pass to yarn moving over the roller.

Coming now to the drawing wherein like reference characters designate like parts throughout,

Fig. 1 is a diagrammatic part side elevation and part section of a lubricant applying apparatus including a roller constructed in accordance with and embodying a preferred form of our invention.

Fig. 2 is an enlarged side elevation of a roller constructed in accordance with our invention.

Fig. 3 is a greatly enlarged sectional view on line 33 of Fig. 2.

As shown in Fig. 1, the yarn 1 may pass downwardly through a spinning cabinet 2 in which there is a guide roller 3 over which the yarn passes. The yarn may pass from the spinning cabinet through an opening 4 over a lubricant applying roller 5, over a guide roller 6 and it may be finally wound upon a bobbin 7 in the usual manner after passing through a guide 8.

The roller 5 may be supported in a tank 9 in which the surface of a lubricant 10 is at such a level that the roller surface 11 will be immersed so that a layer of the lubricant may be carried by the roller 11 to the thread 1 as it passes over the roller.

It should be understood that we do not confine ourselves to applying the lubricant to the yarn at this point, but since it is customary to lubricate the yarn as it passes from the spinning cabinet, we have selected this as a preferred embodiment of our invention. It is also to be understood that in the specification and claims where we refer to lubricant we mean to include any emulsions, oils, tinting solutions, tinting oils or other fluids which are to be conveyed or applied to yarn.

In accordance with our invention, the roller 5 may consist of a tubular member 15 having trunnions 16 at the ends thereof, these trunnions being supported by annular members 17, snugly fitting the inside diameter 18 of the tubular member 15. The surface 11 of the tubular member is preferably made by forming a smooth or even a polished cylinder and then slightly deforming the surface of the cylinder so as to provide a series of extremely minute unpolished irregularities in the surface of the cylinder and thus adapt it to convey lubricant from a bath to yarn. These irregularities in

the surface of the cylinder may be made in a variety of ways, but we find that the following methods have proved the most satisfactory. After the surface of the cylinder has been trued up, smoothed or polished, the surface may be slightly deformed by rubbing with fine emory cloth or sandpaper. This makes a series of fine slightly roughened indentations which have been found to convey a satisfactory layer of lubricant to yarn.

We have found that sand-blasting the smooth surface of a roller is a satisfactory way of slightly deforming its cylindrical surface. We particularly desire to make the deformations in the cylindrical surface so slight that the cylindrical surface will run true and yet roughen the surface sufficiently to cause the roller to pick up and carry with it the desired quantity of lubricant. Considerable care must, of course, be used in providing a roller which must contact with the delicate yarn, since the yarn speed is frequently 30 to 100 times faster than the speed of the rotating roller which applies lubricant to it. Thus, any very material irregularity in the surface of the roller can very readily damage the yarn, although we have found that with a roller roughened or deformed

as described above, entirely satisfactory results can be obtained.

Moreover, since the amount of lubricant conveyed to the yarn does not depend on the variable absorption of a fabric covering, but on a uniformly deformed or slightly roughened cylindrical surface, rollers constructed in accordance with our invention can be relied upon to always convey the same quantity of lubricant to the yarn. It is, therefore, only necessary to hold the lubricant at a constant viscosity in order to produce a perfectly uniform product.

Having thus described our invention, what we declare is new and desire to secure by Letters Patent of the United States is:

An apparatus for applying lubricants and the like to textile yarns including yarn guides, a roller over which the yarn may pass, means for supplying a lubricant to the roller, said roller including a true cylindrical surface slightly deformed over all of said surface by sand blasting and adapted to convey lubricant to yarn passing thereover, the deformed surface entirely covering the surface of the cylinder.

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