

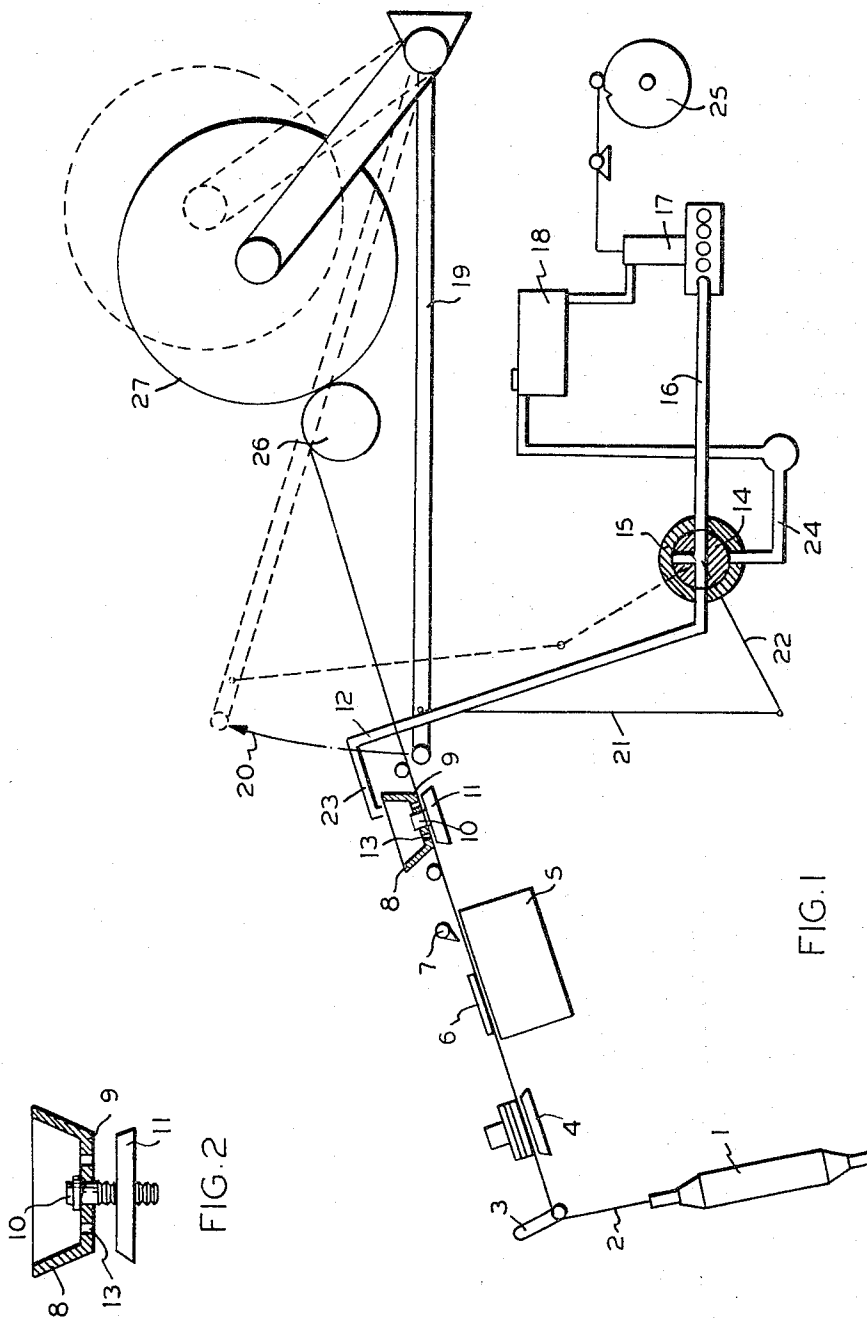
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YARN LUBRICATING DEVICE

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1

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YARN LUBRICATING DEVICE
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The invention relates to a device for waxing or lubricating filamentary material with a paraffin oil or the like where the yarn, thread or filament passes from a supply station over a brake or tensioning device through a liquid receiving slot formed between two discs and a thread guide and is then wound up.

It is known to wax yarns by spraying thereon liquid paraffin. It is a drawback of said known procedure that the degree of waxing or lubricating is irregular and inexact and changes continuously. For said method, the used emulsion can contain only a very small paraffin oil content because otherwise it would become too viscous and would no longer be suitable for spraying. In addition, such device has a low efficiency because the amount of paraffin oil sprayed per unit of time is much higher than the amount actually used for waxing the yarn. A further disadvantage of said device is that when the yarn breaks, the spraying of the emulsion continues and the emulsion collects in the spray chamber without being consumed by the thread; the paraffin oil will overflow from the spray chamber, which results in loss of paraffin oil and in poor thread quality due to temporary over-waxing.

It is also known to apply a liquid sizing agent by means of a pair of closely spaced adjustable rollers which dip into the liquid and raise it into the nip through which the thread is passed. It is also known to pass a filament between two horizontal wires arranged in close adjoining relationship which dip into the liquid tank and between which the liquid is raised by capillary action. Said devices require fluid sizing agents of low viscosity which would not ensure proper waxing.

It is a principal object of the invention to provide a device avoiding the recited drawbacks and ensuring waxing or lubrication of filamentary material with uniform precision and high efficiency.

Other objects and advantages will become apparent from a consideration of the specification and claims.

According to the invention, the discs of a waxing or lubricating device are arranged inclined to the horizontal plane and the upper disc is cup-shaped and provided with a perforated bottom for distribution of the liquid while in the liquid supply line to said cup-shaped disc there is a valve operated by the thread guide.

The liquid film formed between the two discs is continuously and uniformly supplemented by the supply control which ensures uniform application of the lubricating or sizing agent to all sides of the thread and proper lubrication or waxing. In this way, exactly the desired amount of a paraffin oil emulsion can be supplied uniformly and homogeneously per unit of length of the thread passing through the device, and the application of the emulsion can be exactly adapted to the respective conditions. The invention avoids also that the quality of the yarn is affected by yarn breakages and that in such case individual yarn lengths receive an excess of lubricating agent.

According to a preferred embodiment of the invention, the distance of the discs may be adjusted and/or the distributor disc may be arranged for rotation. Such rotation of the disc has a favorable influence of the uniformity of the liquid coating of the yarn, due to the movement of the film layer between the discs.

The riser for the liquid supply can be arranged for swinging out so as to interrupt the liquid supply when yarn breaks occur.

2

By way of example, an apparatus incorporating an embodiment of the invention is shown diagrammatically in the accompanying drawing.

In the drawing, yarn 2 passes from a supply package 1 over a guide ring 3 to a threaded brake 4. The yarn then passes through a conventional cleaning device 5, which in the shown embodiment is equipped with a polishing plate 6 and a scraper 7. Subsequently, the yarn enters the lubrication device which consists of an inclined distributor cup 8 provided with a perforated bottom 9. A distributor plate 11 is secured to said bottom 9, e.g., by means of a stud 10, whereby the spacing of the plate 11 from the bottom 9 may be adjustable.

A paraffin oil emulsion is supplied to the distributor cup 8 by means of a lift pipe 12 and enters through perforation 13, which are formed and distributed as required for the particular purpose, into the space between the distributor cup 9 and the distributor plate 11. A film is formed in said space from which yarn 2 takes up the required amount which is continuously replaced from the distributor cup 9.

The lift pipe, riser or supply line 12 is connected with the control valve 15. The valve 15 in its open position allows a liquid lubricating agent to be forced by pump 17 from a supply tank 18 through line 16, supply line 12, and spout 23 into the distributor cup 8 when a sensing means 19 determines that yarn 2 passes with the required tension undamaged through the lubricating station.

The sensing device 19 is preferably a one-armed lever which turns around a suitable pivot and is actuated by a spring (not shown) which tends to swing it in the direction of arrow 20. Said displacement of the sensing means 19 is opposed by the tension of the yarn so that the lever remains in the position shown in full lines. The lever is connected with the rotatable part 14 of the valve 15 by means of the fork joints 21, 22.

When the yarn breaks, the sensing lever swings far enough inwardly into a position (indicated diagrammatically in broken lines) wherein the rotatable valve member 14 is turned by the connection 21, 22 into the closing position. In said position, the valve connects line 16 with the return line 24 to the supply tank 18. In this way, the liquid supplied by the pump 17 is kept away from the distributing station and the yarn. As the liquid is returned directly to the tank 18, contamination and losses are avoided.

The sensing device shown in the drawing can be replaced by any other suitable device.

For the exact control of the amount of paraffin oil emulsion delivered by the pump 17, there is a control disc 25 which is either an actuating cam disc or only a simple control disc. By suitable adjustment of the speed or of the number of cams, for instance as a function of the rate of passage of the yarn, an exact metering of the paraffin supply is obtained.

The liquid control may be carried out also by other control devices which are suitable in connection with pumps.

The yarn leaving the lubricating station and sliding over the sensing device passes finally on a grooved shaft 26 which has the function to ensure that the yarn is properly wound up on the collecting bobbin 27 which is preferably a criss-cross wound bobbin.

To improve the uniform distribution of the paraffin emulsion and to ensure its intensive contact with the yarn, the distributor disc 11 may be arranged rotatably at such a close distance from the distributor bottom 9 that between the disc and the yarn a slight friction contact is produced which causes rotary movement of the distributor disc so as to enhance the contact of the yarn with the emulsion.

For practical purposes it is of advantage to provide

3

a plurality of the lubricating device passed in series by the yarn, thread, or filaments. For instance, twelve to twenty-four such lubricating or waxing stations may be used, whereby, except the storage tank 18, the circulating pump 17 and corresponding control discs, a corresponding number of all the other elements of the apparatus must be provided.

While the invention has been described particularly in connection with the application of paraffin oil emulsions to yarns, threads, and filaments, it will be understood that it is also applicable to other liquids of an equivalent nature. It also will be understood that the particular embodiment here shown and described is merely illustrative and that alterations and substitutions can be made while still making use of the subject matter herein disclosed and claimed as my invention.

I claim:

1. A device for lubricating yarn comprising at least one pair of superposed discs arranged upwardly inclined to the horizontal plane, said discs having flat opposing surfaces forming between themselves a narrow slot for passage of said yarn, the upper disc being formed as a cup with a perforated bottom, a supply line supplying liquid to the cup of said upper disc and through the bottom of said disc into said slot, the opposing surfaces of said discs being spaced so as to maintain a film of said liquid in

4

said slot, means to take up the liquid-treated yarn, thread sensing means located between said discs and said take-up means, a valve in said supply line, and means actuating said valve and operated by said thread sensing means.

2. A device as claimed in claim 1 including means for adjusting the distance between said two discs.

3. A device as claimed in claim 1 wherein said lower disc is rotatable with respect to said upper disc.

4. A device as claimed in claim 1 including a storage tank for said liquid, a pump, a first line connecting said tank to said valve, a second line connecting said tank with said pump, said valve being a three-way cock connecting said supply line from said pump either with said supply line for said upper disc or with said first line.

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