May 27, 1952 C. F. DULKEN ET AL 2,598,239

CONDITIONING YARN, THREAD AND THE LIKE

Filed Dec. 16, 1946

Fig. 1

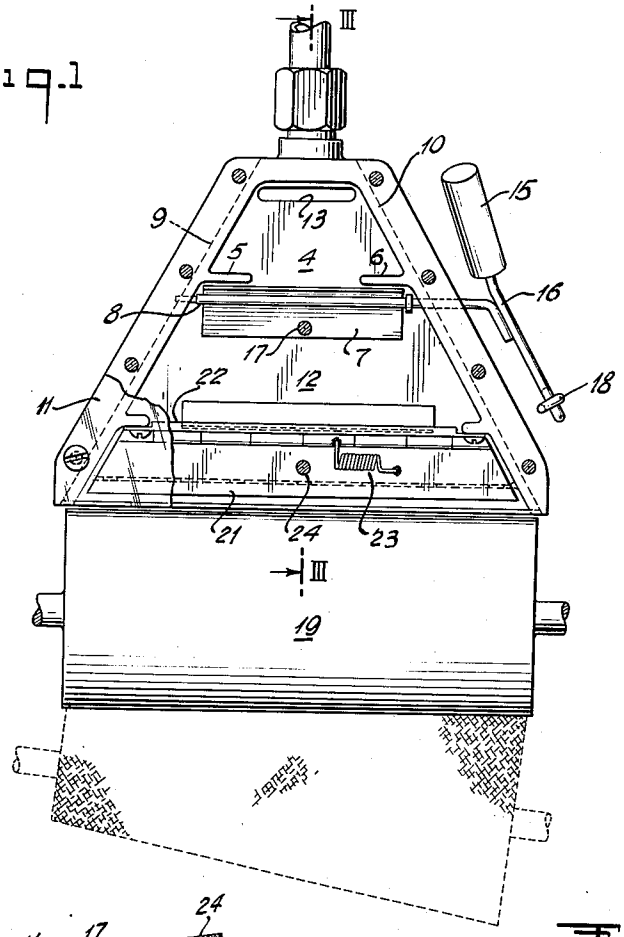


Fig. 2

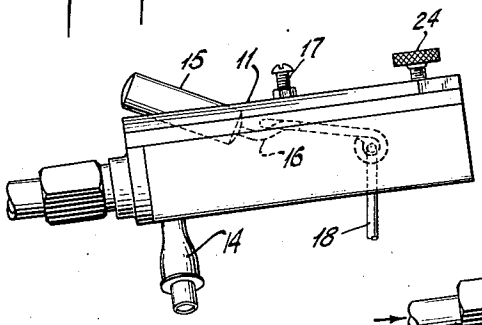


Fig. 3

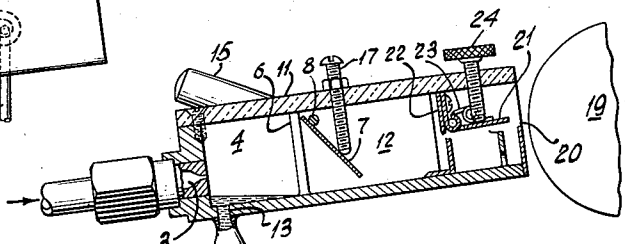
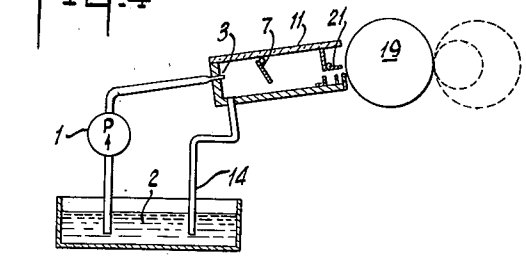


Fig. 4



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Patented May 27, 1952

2,598,239

UNITED STATES PATENT OFFICE

2,598,239

CONDITIONING YARN, THREAD AND THE LIKE

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Application December 16, 1946, Serial No. 716,446

5 Claims. (Cl. 299—88.5)

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The present invention relates to a method and means for applying a textile material conditioning or dyeing liquid to the roll which is used in conventional winding machines for rotating the package while it forms on the yarn holder.

An object of the invention is the provision of a method as aforesaid characterized in that the liquid is first atomized by pressure reduction in a nozzle, and the resulting mist is caused to form a sheetlike spray of mist which is directed onto the roll, on which the spray is converted into a film which is wiped from the roll by the yarn or thread or the like while it forms the package.

A further object of the invention is the provision of a method as described supra in which the liquid is drawn from a source of supply in a substantially continuous stream all of which is atomized or transformed into a fog or mist, and a portion of said mist is caused to flow and be sprayed on the roll in the form of sheet, while the other portion of the liquid is returned to the source in a substantially continuous flow.

Another object of the invention is the control, in a fluid application system of the type described supra, of the quantity of the portion caused to form a sheetlike spray by controlling the amount of fluid returned to the source.

A further object of the invention is the control of the thickness of the sheetlike mist spray and thereby of the density of the mist.

An object of the invention is the provision of methods as described supra comprising the step of returning all of the atomized liquid to the source in case formation of the package is interrupted, which stoppage is caused in conventional winding machines for example upon breakage of a thread.

It is an object of the present invention to provide a method of the character described which primarily utilizes an existing manufacturing operation for assuring the new result.

Another object of the invention resides in the provision of an apparatus to carry out the above method and which apparatus forms an attachment to conventional winding machines.

A further object of the present invention is the provision of an apparatus producing the new result which apparatus, except for a valve or gate means which is automatically closed in dependence on a stoppage of the winding operation, has no moving parts.

An object of the present invention is the provision of an apparatus which has no parts which move during normal operation of the device.

Further and other objects of the present in-

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vention will be hereinafter set forth in the accompanying specification and claims and shown in the drawings which, by way of illustration, show what we now consider to be a preferred embodiment of our invention.

In the drawings:

Fig. 1 is a top view of the device according to the invention with the top plate removed;

Fig. 2 is a side view of the device shown in Fig. 1;

Fig. 3 is a longitudinal section through the device shown in Fig. 1 taken along line III—III of said figure;

Fig. 4 is a diagrammatic illustration of the device according to the invention with the conduits leading thereto and therefrom.

Like numerals designate like parts in all figures of the drawing.

The treating fluid is pumped by a pump 1 from the source of supply or reservoir 2 into the nozzle 3. Due to pressure reduction and the thin slot opening of the nozzle the fluid is split into a fine mist—a process which is generally called atomization. The mist fills a chamber 4 and a portion of the mist leaves this chamber through the rectangular opening between the wall projections 5 and 6. This opening is controlled by the flap valve 7 which is connected to the rod 8 which is rotatably held in the side walls 9 and 10 of the casing of the device. By turning the flap 7 clockwise until its lower edge abuts the bottom of the casing and its upper edge the top plate 11 the flow of the mist from chamber 4 into chamber 12 can be interrupted.

The portion of the mist which does not escape into chamber 12 leaves chamber 4 through slot 13 from which it is returned to reservoir 2 through conduit 14. The quantity of fluid returned through conduit 14 depends on the position of valve 7.

Valve 7 is normally held open by a weight 15 connected to one arm of lever 16 which is connected to hinge rod 8 and extends substantially transversely thereto. The extent of opening of valve 7 depends on the setting of screw 17 against the lower end of which the flap 7 is pressed by the action of weight 15. A spring may be used instead of weight 15 without changing the result.

To the far end of lever 16 a link member 18 is connected which is linked to the conventional trip mechanism of the existing winding machine in connection with which the attachment according to the invention is used. These trip mechanisms are usually responsive to a failure in the yarn or thread to be wound and discon-

nect the drive roll 19 from the package. In this case moistening of the roll 19 is undesirable and link 18 pulls on lever 16 and closes valve 7.

The mist entering chamber 12 broadens out due to the triangular configuration of the casing of the new device and leaves chamber 12 through slot 20. The width of this slot can be adjusted by proper positioning of flap 21 which is hinged to an end wall member 22 of chamber 12 and extends through the width of the wide end of chamber 12. Flap 21 is held in open position by means of spring 23 and abuts the end of a set screw 24. The fog or mist escaping through slot 20 has the form of a sheet which is sprayed onto roll 19 and forms thereon a film which is picked up or wiped off by the thread or yarn while it is wound on the package.

It is advisable to mount the applicator or spray device in slightly inclined position on the winding machine, with the discharge slot higher than the slot or opening through which excess fluid is returned to the source. This assures that any liquid which is insufficiently atomized flows on the bottom of the applicator back to the opening 13 through which it is returned to the source of supply, and a homogeneous mist of fluid leaves the applicator, and dripping from the discharge slot 20 is avoided.

While we believe the above described embodiment of our invention to be a preferred embodiment, we wish it to be understood that we do not desire to be limited to the exact details of design and construction shown and described, for obvious modifications will occur to a person skilled in the art.

We claim:

1. An apparatus for producing a film of yarn conditioning liquid on the roller driving the package in a yarn winding machine, said apparatus comprising, in combination, a flat substantially triangular case having a substantially triangular bottom wall and a substantially triangular top wall parallel to said bottom wall, an atomizing nozzle terminating in a corner of said case and delivering a spray jet of liquid into the case, said case having a side wall disposed opposite said nozzle and extending at substantially a right angle to said bottom and top walls and comprising slot means for discharging a sheet of vaporized liquid from said case.

2. An apparatus as defined in claim 1, said side wall comprising a stationary wall portion having an edge and being disposed transversely of the flow of the vaporized liquid and a flap member having a surface portion disposed substantially parallel to the flow of the vaporized liquid and in juxtaposition to said edge for forming a slot opening therewith.

3. An apparatus for producing a film of yarn conditioning liquid on the roller driving the package in a yarn winding machine, said apparatus comprising, in combination, a flat substantially triangular case having a substantially triangular bottom wall and a substantially triangular top wall parallel to said bottom wall, an atomizing nozzle terminating in a corner of said case and delivering a spray jet of liquid into the case, said case having a side wall disposed opposite said nozzle and extending at substantially a right angle to said bottom and top walls and comprising slot means for discharging a sheet of vaporized liquid from said case, said case being in inclined position and said slot means being elevated relative to the corner where the nozzle is located, an outlet for the liquid disposed at the lowest point of said case, and a gate in said case disposed in the path of the atomized liquid between the nozzle and the slot means, said gate being swingably connected with said case about an axis parallel and adjacent to the top wall and adapted to depress the stream of atomized liquid toward the bottom wall.

4. An apparatus as defined in claim 2, said flap member being swingably connected with said case to swing about an axis substantially parallel to said wall portion and to the top and bottom walls of said case.

5. An apparatus as defined in claim 3, comprising pivot means extending from the outside into said case and swingably supporting said gate, actuating means connected with said pivot means for operating the gate from the outside of the case, adjusting means extending through said top wall into said case and abutting said gate for limiting its opening, and means connected with said actuating means for yieldingly pressing said gate against said adjusting means.

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