Feb. 6, 1945. C. F. DULKEN ET AL 2,368,648

APPARATUS FOR TREATING THREAD

Filed Aug. 27, 1941

Fig. 1.

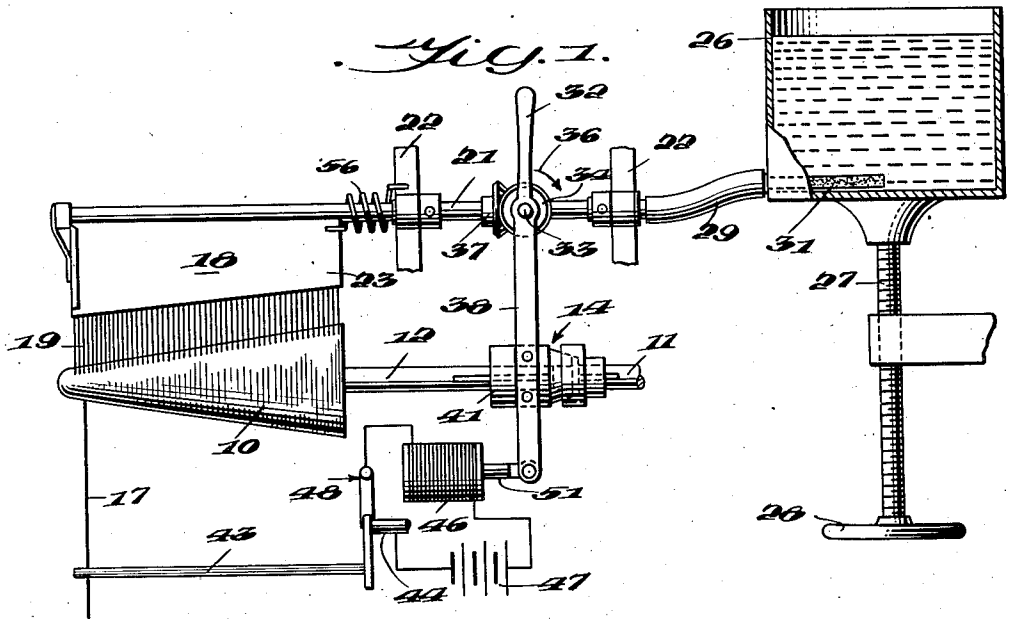


Fig. 2.

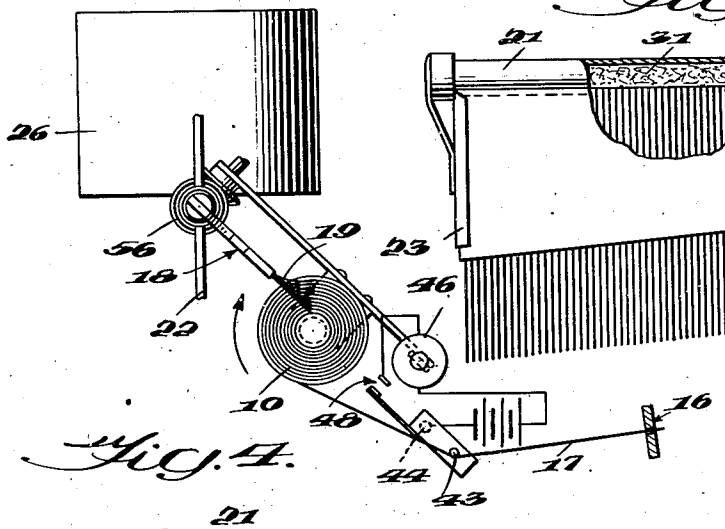
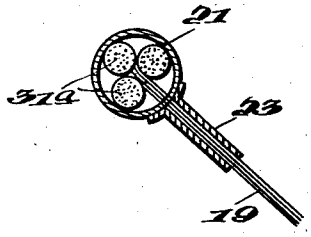


Fig. 3.

Fig. 4.



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APPARATUS FOR TREATING THREAD

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8 Claims. (Cl. 91—38)

The present invention relates to apparatus for treating thread or yarn and more specifically pertains to an arrangement for applying moisture or liquid to the thread or yarn as the same is wound on a thread carrier or bobbin.

An object of the invention resides in providing means for supplying conditioning liquid to yarn as the yarn is being wound on a rotating carrier member or bobbin so that the conditioning liquid will be supplied to each layer of yarn wound on the carrier member.

A further object of the invention includes means for supplying moisture to thread as the thread is wound on a bobbin including means for varying the quantity of liquid supplied to the thread.

A still further object of the invention resides in providing a brush having bristles with the brush mounted to engage the thread being wound on the bobbin including means for supplying conditioning liquid to the bristles of the brush whereby the liquid is transferred to the thread as the same is wound on the bobbin.

A more specific object of the invention pertains to the provision of a fountain brush supplied with conditioning liquid with the brush mounted to swing into engagement with the thread being wound on a thread carrier including means for moving the brush away from the thread on the thread carrier when the thread being wound breaks or in the absence of tension on the thread being wound on the bobbin.

Another object of the invention includes means for mounting a brush supplied with liquid adjacent the thread carrier of winding apparatus so that the brush may be moved into engagement with thread wound on the thread carrier and means for swinging the brush away from the thread carrier when rotation thereof is stopped.

Other objects and features of the invention will be more apparent upon a consideration of the accompanying drawing and the following description wherein an exemplary embodiment of the invention is disclosed.

In the drawing:

Fig. 1 is a diagrammatic view partly in section illustrating the general organization of apparatus embodying the invention.

Fig. 2 is an end elevational view of the arrangement shown in Fig. 1.

Fig. 3 is an enlarged plan view of the brush with parts thereof broken away to illustrate means for supplying liquid to the bristles.

Fig. 4 is a transverse sectional view of a modified brush.

Referring to the drawing there is shown at 10 a carrier member or a bobbin of a conventional type such as employed in some types of winding machines. The carrier member 10 is preferably arranged with the axis thereof in a horizontal manner as shown in Fig. 1. The thread or yarn carrier or bobbin is rotated by means of a driven shaft 11. The shaft 11 is driven from a suitable power source as is customary in winding machines. Power is transmitted from the shaft 11 to the shaft 12 through a clutch mechanism indicated generally at 14. Thus, the thread carrier 10 may be rotated by moving the parts of the clutch 14 into driving engagement and the bobbin 10 will of course be stopped when the shaft 12 is de-clutched from the shaft 11.

A thread or yarn 17 to be wound on the carrier member 10 extends through suitable tension means diagrammatically illustrated at 16 in Fig. 2. The thread 17 after passing through the tension means 16 is wound on the bobbin 10 in the direction of the arrow shown in Fig. 2. The thread 17 is also guided or bodily moved longitudinally of the carrier member 10 in a well known manner so that a layer of the thread or yarn is arranged on the bobbin 10 after which another layer is wound on the layer previously wound on the bobbin.

In carrying out the invention means is provided for supplying a suitable conditioning liquid to the thread or yarn as the same is wound on the bobbin 10. Such means may for example include a brush shown generally at 18 having bristles 19 for engaging the thread or yarn wound on the bobbin 10. The brush is preferably mounted above the thread carrier 10 as shown in Fig. 2. Thus, the brush which is supplied with moistening liquid as hereinafter described will be in such a position that the moistening liquid will flow or creep downwardly on the bristles 19. The brush 18 is also mounted in such a manner that the bristles will engage the bobbin or the thread thereon and the bristles preferably extend in the rotating direction of the thread carrier 10. In other words the bobbin 10 is rotated in a clockwise direction when the bristles are arranged above the carrier member as shown in Fig. 2.

The brush may be formed of a substantially rigid pipe 21 rotatably mounted in suitable brackets 22 which may be supported on the winding apparatus. The bristles 19 may extend into the pipe 21 as shown in Fig. 3. A suitable casing 23 may be provided for enclosing portions of the

bristles adjacent the pipe 21. This casing 23 is suitably secured to the pipe 21.

The moistening apparatus includes means for supplying liquid to the bristles 19. Such means may include a tank 26 for storing a quantity of conditioning liquid therein. The tank 26 is arranged to be raised or lowered with respect to the position of the brush 18 by any suitable means such as a threaded shaft 27 and a handwheel 28. The tank 26 may be connected to the pipe 21 by means of a flexible tube 29 to permit relative movement between the pipe 21 and the tank 26. Thus, by raising the tank 26 more liquid will be supplied to the bristles 19 since the pressure of the liquid within the pipe 21 will thereby be increased. Likewise, less liquid will be supplied to the bristles of the brush when the handwheel 28 is rotated to lower the tank 26. The vertical movement of the tank 26 thus provides means for varying the amount of moisture conveyed to the thread or yarn being wound on the bobbin 10.

The arrangement may include wick means within the pipe 21 and a wick 31 may extend therefrom through the flexible tube 29 into the tank 26. The wick 31 will thus absorb a supply of the conditioning liquid from the tank 26 and retain the liquid so as to make the moisture available to the bristles 19. With such an arrangement and when the tank 26 is raised with respect to the brush 18 the wick 31 will be saturated at a faster rate thereby feeding more liquid to the bristles which in turn will supply a greater quantity of the liquid to the yarn on the surface of the carrier member 10. By lowering the container 26 the saturation of the wick will be reduced and consequently the transfer of liquid by means of the bristles 19 onto the surface of the thread or yarn on the bobbin 10 will thereby be reduced. Even when the tank 26 is moved to a position below the level of the brush 18 liquid will nevertheless be conveyed to the bristles 19 by capillary action of the wick 31. The quantity of liquid applied to the thread being wound on the bobbin 10 may be further controlled by varying the speed of the rotating thread carrier.

When the rotation of the bobbin 10 ceases it is advisable to remove the brush with the bristles 19 thereof from engagement with the thread or yarn on the bobbin. Any suitable means may be provided for moving the brush 18 to a position preventing the bristles 19 from transferring moisture to the thread on the bobbin. Such means for example may include a handle 32 which is mounted to rotate a shaft 33. A bevelled gear wheel 34 suitably keyed to the shaft 33 will be rotated when the handle 32 swings in the direction of the arrow 36. Such rotation of the gear 34 will rotate a beveled gear wheel 37 secured to the pipe 21 so as to rotate the rigid pipe in the brackets 22 and swing the brush 18 away from the bobbin 10. A lever 38 is also pivoted with the rotation of the shaft 33 by the handle 32 to de-clutch the shaft 12 from the shaft 11. For this purpose one part 41 of the clutch is provided with a circumferentially extending groove into which a lug carried by the lever 36 extends. The groove in the member 41 may be sufficiently large to permit such swinging movement of the lever 38. Thus, when the shaft 12 is de-clutched from the shaft 11 to stop the bobbin 10 the brush 18 will be removed to a position where the bristles 19 will no longer engage the thread on the bobbin 10.

The invention also includes automatic means for moving the brush 18 to a position for preventing liquid from being transferred to the thread on the carrier member 10 when the yarn breaks or in the absence of thread tension. Such means may include a feeler arm 43 pivotally mounted to swing on a pin 44. Thus, when the thread 17 breaks or in the absence of tension thereon the feeler arm 43 will swing downwardly in Fig. 2. A suitable arrangement for swinging the brush 18 or rotating the pipe 21 when the thread 17 breaks or in the absence of tension may include an electromagnet 46 which is supplied with current from a suitable source such as a battery 47 when the contacts 48 are closed by the downward swinging movement of the feeler arm 43. When the electromagnet 46 is energized an armature 51 thereof will be drawn into the coil of the electromagnet to swing the lever 36 to the left in Fig. 1 and rotate the shaft 33 in a clockwise direction. Such rotation of the gear 34 will cause the gear 37 to be rotated and swing the brush 18 away from the bobbin 10. The armature 51 being connected to the lever 36, the clutch member 41 will also be moved to the left to interrupt the driving connection between the shafts 11 and 12 and thus stop the bobbin 10 when the thread breaks or in the absence of tension.

The brush 18 is preferably mounted above the bobbin 10 so that the brush will normally swing downwardly to lay on the thread carried by the bobbin. Yieldable means, however, may be provided for more positively moving the bristles 19 of the brush into engagement with the thread or yarn being wound on the thread carrier. Such yieldable means may consist of a relatively light torsion spring 56 biasing the brush into a position whereby the bristles 19 engage the thread on the bobbin 10.

The means for supplying liquid to the bristles 19 of the brush may be constructed as shown in Fig. 4 wherein a plurality of small wicks 31*a* are arranged within the pipe 21 and these wicks may also extend into the tank 26.

While the invention has been described with reference to specific structural details it will be appreciated that changes may be made therein by those skilled in the art. Such changes may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

We claim:

1. Apparatus for applying moisture to yarn comprising, a bobbin winding the yarn thereon, a brush having bristles engaging the yarn being wound on the bobbin, means supplying moistening liquid to said bristles, means for moving the brush and bristles away from the bobbin and means operably responsive to breakage of the yarn for actuating said brush moving means whereby said brush and the bristles thereof are moved away from the bobbin.

2. Apparatus for applying moisture to thread comprising, a rotating thread carrier winding the thread thereon, a brush having downwardly extending bristles engaging the thread being wound on the thread carrier, means supplying moistening liquid to said bristles, means for raising the brush and bristles and means operably responsive to the absence of thread tension for actuating said raising means whereby said brush and the bristles are raised from engagement with the thread on the thread carrier.

3. Apparatus for applying moisture to thread comprising, a rotatable thread carrier winding the thread thereon, a brush having bristles en-

gaging the thread being wound on the thread carrier, means for supplying moistening liquid to said bristles, means including a clutch for rotating said thread carrier, manually operable means for removing the bristles of the brush from engagement with the thread on the thread carrier and uncoupling said clutch.

4. Apparatus for applying moisture to yarn comprising, a driven shaft, a bobbin, a clutch transmitting rotation of the driven shaft to the bobbin whereby the bobbin is rotated to wind thread thereon, a brush having bristles engaging the thread being wound on the bobbin, means supplying moistening liquid to said bristles, and means operably responsive to the absence of tension of the thread being wound on the bobbin for de-clutching the bobbin from the driven shaft and moving the brush from engagement with the thread on the bobbin.

5. Apparatus for applying moisture to yarn comprising, a rotating yarn carrier winding the yarn thereon, a brush having bristles engaging the yarn being wound on the yarn carrier, a tank for a supply of moistening liquid, means for raising and lowering said tank with respect to said brush, and wick means for conveying liquid from said tank to said bristles.

6. Apparatus for applying moisture to yarn comprising, a horizontally arranged rotating yarn carrier winding the yarn thereon, a pipe arranged above and substantially parallel to the axis of the yarn carrier, wick means in said pipe, means supplying liquid to said wick means, a brush carried by said pipe including bristles extending into the pipe adjacent said wick, and means swingably supporting the pipe so that the bristles may move into engagement with the yarn being wound on the yarn carrier.

7. Apparatus for applying moisture to yarn comprising, a rotating thread carrier winding the thread thereon, a movably mounted brush having bristles engaging the yarn being wound on the bobbin, means supplying moistening liquid to said bristles, a clutch controlling the transmission of motion to the thread carrier, and manually operable means for simultaneously disconnecting the clutch and for moving the brush away from the carrier.

8. Apparatus as claimed in claim 7, in which feeler means operatively responsive to breakage of the yarn are provided and electrically and operatively connected with the manually operating means for automatically declutching the thread carrier and for moving the brush away from the yarn.

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