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DEVICE FOR TREATING YARN AND THREAD WITH A LIQUID

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2 Sheets-Sheet 1

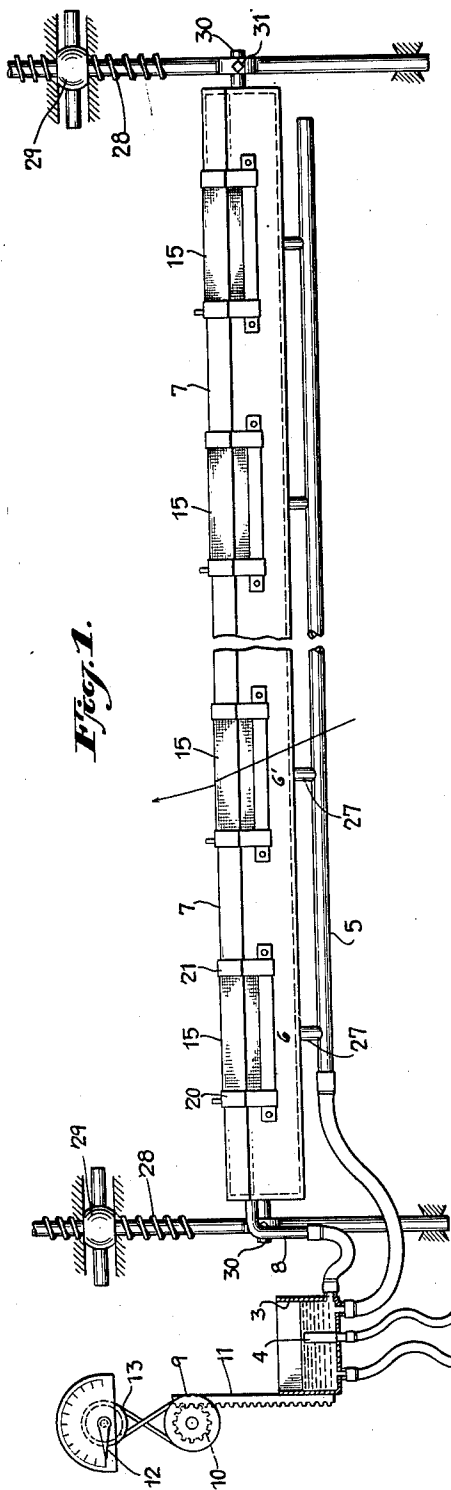


Fig. 1.

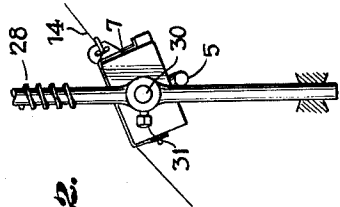


Fig. 2.

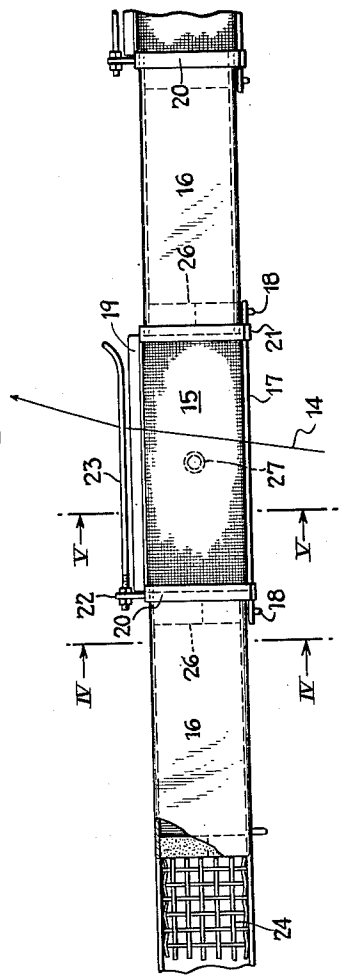


Fig. 3.

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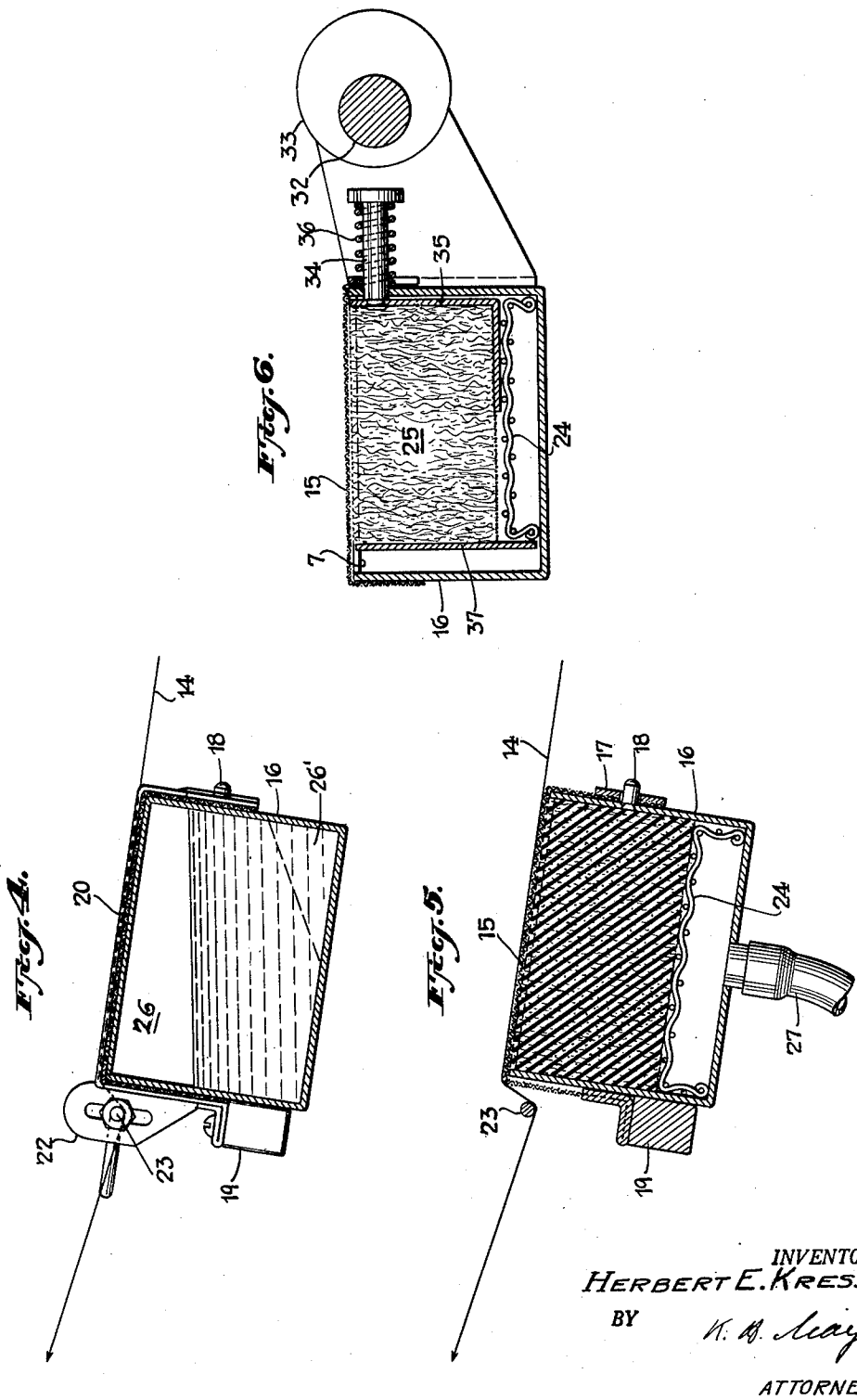
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DEVICE FOR TREATING YARN AND THREAD
WITH A LIQUID

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14 Claims. (Cl. 118—401)

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The present invention relates to a system for conditioning yarn and thread with a liquid while the yarn is being wound for example on a conventional winder which may have hundred spindles.

It is an object of the present invention to provide a safe and practical device to condition yarn and thread while in the process of winding. Such winding is necessary in all cases where yarn is prepared for shipping and further manufacturing. The device according to the invention is suitable to be attached to the winding machine so that no extra labor is required to guide the yarn over the conditioning system. Any desired amount of moisture can be added to the yarn with the system according to the invention. Different liquids may be used for producing different results, such as lubrication, setting twist, tinting, etc. The system according to the invention affords uniform application of moisture to the yarn and thread and further handling of the yarn is unnecessary, such as placing yarns into conditioning rooms for twist-setting and moisture pick-up. It has been found that yarns treated with conditioning fluids by the system according to the invention are stronger, thus better fit for knitting, weaving and other manufacturing.

The new system is based on the law of capillary attraction, the treating liquid being fed to a sponge made of synthetic material. Such sponges have a grain extending in a definite direction and they are so placed in the system according to the invention that the grain is substantially in a vertical position. The bottom of the sponge is submerged in the treating liquid. The yarn to be treated passes over the top of the sponge, a stainless steel screen which is rolled down to a very smooth surface being interposed between the top of the sponge and the yarn which oscillates laterally over the screen surface moving at the same time in the direction of the longitudinal axis of the yarn. The sponge located under the screen surface, through capillary attraction, feeds the surface of the screen wire with more or less liquid depending on the extent the sponge is submerged in the treating liquid.

The novel features which are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, and additional objects and advantages thereof will best be understood from the following description of an embodiment thereof when read in connection with the accompanying drawing in which

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Fig. 1 is a diagrammatic part sectional side elevation of an apparatus according to the invention;

Fig. 2 is an end view of the apparatus shown in Fig. 1;

Fig. 3 is a top view of a part of an applicator according to the invention;

Fig. 4 is a cross sectional view of the applicator along line IV—IV of Fig. 3;

Fig. 5 is a cross sectional view of the applicator along line V—V of Fig. 3;

Fig. 6 is a cross sectional view of a modified applicator according to the invention.

Like parts are designated by like numerals in all figures of the drawing.

Referring more particularly to Fig. 1 of the drawing, numeral 1 designates a reservoir tank having a capacity of, say, 20 to 40 gallons from which the treating liquid is pumped by means of pump 2 into a level tank 3. The latter is provided with an overflow 4 from which excess liquid is continuously returned to the tank 1. Numeral 5 designates a distributing conduit which is connected with each sponge section 6, 6' of the applicator 7. A glass tube 8, which communicates with the level tank 3 through a neoprene hose, indicates the liquid level in the applicator. The level tank may be raised or lowered by turning a wheel 9 whose shaft carries a pinion 10 engaging a rack 11 fast on the level tank 3. The elevation of the level tank is indicated by an indicator hand 12 fixed on the shaft of a pulley 13 which is driven by the shaft of the hand wheel 9.

As seen in Figs 3 to 5, the yarn 14 travels over a wire screen 15 which covers an opening in the top wall of conduit 16 which has a rectangular or square cross section and forms the applicator 7. The longitudinal marginal portions of the wire screens 15 are bent around the top corners of the conduit, a longitudinal plate 17 being attached to one of the longitudinal marginal portions of the screen. The plate 17 has two holes so that it can be slipped onto pins 18 extending from a side wall of the conduit 16. The other longitudinal marginal portion of the screen is weighted by a longitudinal brass or stainless steel bar 19 so that the screen is held to the conduit 16. In addition, two U-shaped hold-down brackets or caps 20 and 21 are slipped over the lateral edges of the screen and over the top of the conduit 16. One of these brackets has an ear 22 provided with a slot for adjustably mounting a bail wire 23 for holding the yarn 14 on the screen.

Inside the conduit 16 below each hole which

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is covered by a screen 15, is a wire screen basket 24. The space in the conduit between the screen basket 24 and the screen 15 is filled with sponge rubber 25. A rubber block 26 is provided inside the conduit 3 at each end of the screen basket 24 to hold the sponge rubber 25 in place. The blocks 26 have a cut-away corner 26' to afford circulating of the yarn treating liquid through the conduit 16. Each screen section of conduit 16 is provided with a liquid supply conduit 27 which is connected to the main supply tube 5 receiving liquid from the liquid level tank 3.

On a conventional winder the yarn or thread is moved from a cone, tube, or other package over the stainless steel wire screen forming part of the device according to the invention which can be attached to the winder without making alteration thereon. The synthetic sponge located under the wire screen is so positioned that its grain is in a substantially vertical position.

To change the pick-up of moisture by the yarn passing over the screen, the level tank 3 is raised or lowered. A further method of changing the pick-up is to raise or lower the conditioning tube or applicator itself to create more or less pressure against the passing yarn. The up and down movement of the conditioning tube is obtained by supporting the applicator on screws 28 having nut wheels 29 cooperative therewith whose elevation is fixed. To produce the desired contact between the passing yarn and the screen, provision is made to tilt the applicator forward or backward to make more or less surface contact of the yarn on the conditioning screen. For this purpose the applicator is provided with support pins 30 which are revoluble in suitable eyes of the threaded rods 28. The position of the applicator 7 can be fixed by tightening a set screw 31 (Fig. 2).

The sponges 25 are preferably cut to the size of the actual yarn spread in both directions, the oscillating motion of the yarn usually amounting to two to four inches and in certain cases to more. If the sponge is wider than the spread of the yarn on the screen, an uneven conditioning results. Furthermore, lint will collect on the edges of the screen strongly supported to accumulate there if surplus sponge is underneath. Lint will and can accumulate on the stainless steel caps 20, 21 which are set over the screen wire outside of the cruising range of the yarn, without causing any disturbance.

In cases where extremely heavy yarn conditioning is desired, provisions are made to periodically compress the sponges. These are illustrated in Fig. 6. A slowly rotated shaft 32 is arranged alongside the applicator 7 having two eccentric cams 33 mounted at all portions of the shaft which are adjacent to a wire screen or treating section of the applicator. The cams 33 individually abut against plates at the ends of pins 34 which are connected with a stainless steel plate 35 which is as wide and as high as the sponge. These pins extend through holes in the conduit 16 and are pressed against the cams by means of springs 36. When the eccentric cams push the pins, the plate 35 is pressed against the sponge squeezing a quantity of fluid through the screen which is picked up by the passing yarn. A plate 37 may be provided opposite to the pusher plate 35 so that the sponge 25 does not abut against the inside side wall of the conduit 16 but against the plate 37 which is spaced from the side wall, providing a chamber receiving surplus fluid and preventing excessive flooding of the screen 75

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15. By changing the speed of rotation of the shaft 32 the compressions of the sponge may be made more or less frequent.

If the device according to the invention is attached to a conventional winder, the yarn is wound on to a paper carrier after passing the conditioning screen.

A conventional winder may have 50 or 60 spindles on each side distributed over a length of 40 to 60 feet. The conditioning tube or applicator according to the invention, however, is not made that long. It is made in units supplying, for example, five spindles and being approximately four feet long. If more than five spindles are installed on the winder, an additional applicator unit or units are installed whose conduits 16 are not connected. Each unit has its own support for lifting and tilting the conditioning tube so that the position of each tube can be individually adjusted. The liquid feed pipe 5 is designed to reach, at the most, 25 to 30 spindles from one side of the winding frame. If a frame has twice as many spindles, a liquid supply line extends from each end of the frame and a reservoir tank and level tank is arranged at each end of the frame. A conventional air vent may be provided in each feed line to facilitate quick movement of the liquid and filling of the system and to eliminate air pockets.

What is claimed is:

1. A device for treating yarn and thread, which is being wound, with a treating liquid, said device comprising a horizontally extended conduit including a plurality of spaced liquid applying sections, each of said sections comprising an oblong opening in said conduit, a wire screen covering said opening, and a sponge disposed in said conduit underneath said screen; treating liquid supply means including a pipe disposed alongside said conduit, and a plurality of conduit means individually connecting said pipe with said sections.

2. A device as defined in claim 1, said sponge being made of synthetic material and having a grain, said grain extending substantially at a right angle relatively to said wire screen.

3. A device as defined in claim 1, comprising solid blocks disposed in said conduit at each end of said sponges.

4. A device according to claim 3, said blocks having a cut-away portion to afford circulation of liquid in said conduit past said blocks.

5. A device for treating yarn and thread, which is being wound, with a treating liquid, said device comprising a horizontally extended conduit including a plurality of spaced liquid applying sections, each of said sections comprising an oblong opening in said conduit, a wire screen covering said opening, a wire screen basket placed on the bottom of the conduit opposite said opening, and a sponge disposed in said conduit between said screen and said basket; treating liquid supply means including a pipe disposed alongside said conduit, and a plurality of conduit means individually connecting said pipe with said sections below said basket.

6. A device for treating yarn and thread, which is being wound, with a treating liquid, said device comprising a horizontally extended conduit including a plurality of spaced liquid applying sections, each of said sections comprising an oblong opening in said conduit, a wire screen covering said opening, a sponge disposed in said conduit underneath said screen, and a bail wire extending substantially parallel to the

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longitudinal axis of said conduit and being mounted thereon adjustably as to its elevation, the yarn slidably passing over said screen and underneath said bail wire; treating liquid supply means including a pipe disposed alongside said conduit, and a plurality of conduit means individually connecting said pipe with said sections.

7. A device for treating yarn and thread, which is being wound, with a treating liquid, said device comprising a horizontally extended conduit including a plurality of spaced liquid applying sections, each of said sections comprising an oblong opening in said conduit, a wire screen covering said opening, a substantially U-shaped cap member placed over the ends of said screen and said conduit, and a sponge disposed in said conduit underneath said screen; treating liquid supply means including a pipe disposed alongside said conduit, and a plurality of conduit means individually connecting said pipe with said sections.

8. A device for treating yarn and thread, which is being wound, with a treating liquid, said device comprising a horizontally extended conduit including a plurality of spaced liquid applying sections, each of said sections comprising an oblong opening in said conduit, a wire screen covering said opening, and a sponge disposed in said conduit underneath said screen; treating liquid supply means including a pipe disposed alongside said conduit, and a plurality of conduit means individually connecting said pipe with said sections; and support means connected with said conduit, said support means including adjusting means for adjusting the elevation of said conduit.

9. A device for treating yarn and thread, which is being wound, with a treating liquid, said device comprising a horizontally extended conduit including a plurality of spaced liquid applying sections, each of said sections comprising an oblong opening in said conduit, a wire screen covering said opening, and a sponge disposed in said conduit underneath said screen; treating liquid supply means including a pipe disposed alongside said conduit, and a plurality of conduit means individually connecting said pipe with said sections; and support means, said conduit being rotatably connected with said support means affording rotation of said conduit about its longitudinal axis, said support means including adjusting means for adjusting the elevation of said conduit, and including fixing means for fixing the angular position of said conduit.

10. A device for treating yarn and thread, which is being wound, with a treating liquid, said device comprising a horizontally extended conduit including a plurality of spaced liquid applying sections, each of said sections comprising an oblong opening in said conduit, a wire screen

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covering said opening, and a sponge disposed in said conduit underneath said screen; treating liquid supply means including a pipe disposed alongside said conduit, and a plurality of conduit means individually connecting said pipe with said sections; and adjusting means connected with said conduit for affording rotation of said conduit about its longitudinal axis, said adjusting means including fixing means for fixing said conduit in a desired angular position.

11. A device for treating yarn and thread, which is being wound, with a treating liquid, said device comprising a horizontally extended conduit including a plurality of spaced liquid applying sections, each of said sections comprising an oblong opening in said conduit, a wire screen covering said opening, and a sponge disposed in said conduit underneath said screen; treating liquid supply means including a pipe disposed alongside said conduit, a plurality of conduit means individually connecting said pipe with said sections, and a liquid level maintaining means connected with said pipe and including adjusting means for adjusting the elevation of said liquid level maintaining means and of the liquid level in said conduit.

12. A device for treating yarn and thread, which is being wound, with a treating liquid, said device comprising a horizontally extended conduit including a plurality of spaced liquid applying sections, each of said sections comprising an oblong opening in said conduit, a wire screen covering said opening, a sponge disposed in said conduit underneath said screen, a pusher plate laterally movably arranged in said conduit alongside said sponge, and actuating means disposed outside of said conduit and connected with said pusher plate for periodically pressing the latter against said sponge; treating liquid supply means including a pipe disposed alongside said conduit, and a plurality of conduit means individually connecting said pipe with said sections.

13. A device as defined in claim 12, comprising plate means disposed in and fixed to said conduit opposite and substantially parallel to said pusher plate and in spaced relation to the inside wall of said conduit, said sponge being disposed between said pusher plate and said plate means.

14. A device according to claim 13, said plate means having an upper edge substantially parallel to said wire screen.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
875,546	Metzner	Dec. 31, 1907
1,424,100	Johnson	July 25, 1922
1,776,529	Weinerth	Sept. 23, 1930
1,968,677	Ferguson	July 31, 1934