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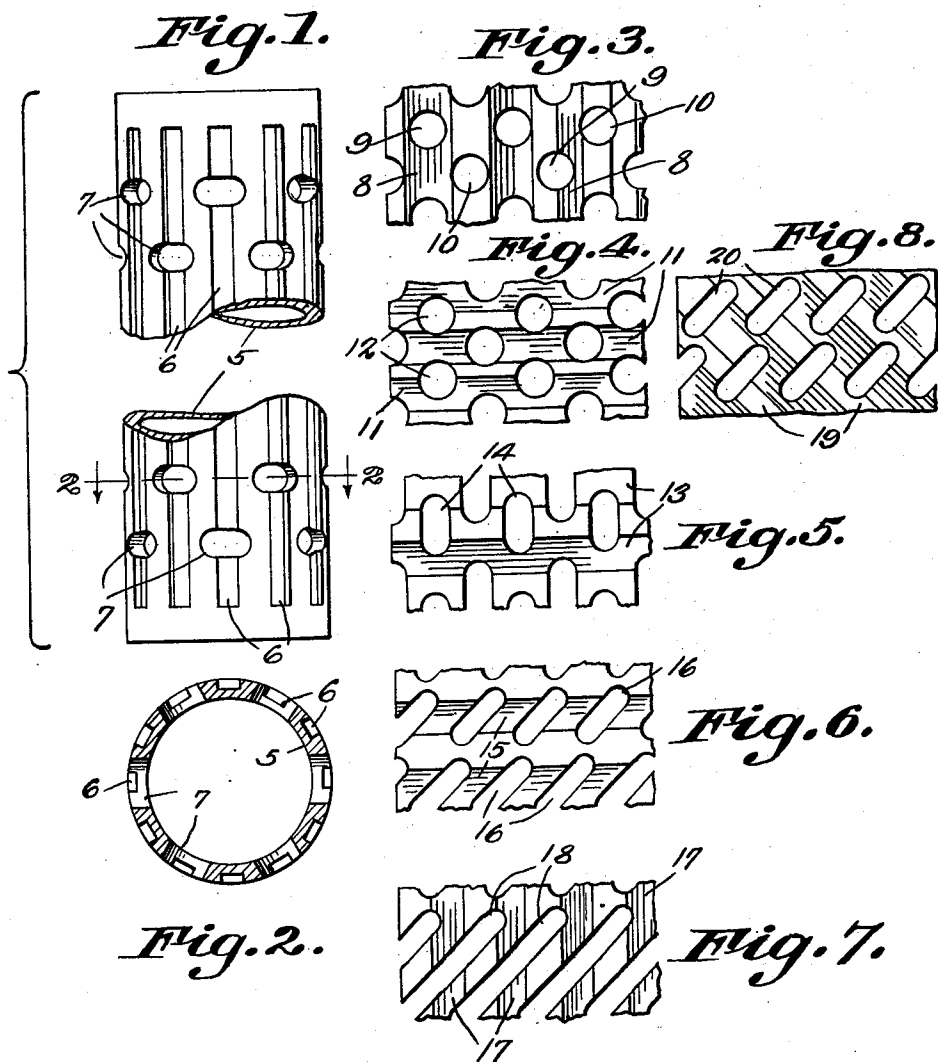
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2,633,729

YARN TUBE

Filed March 31, 1945

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

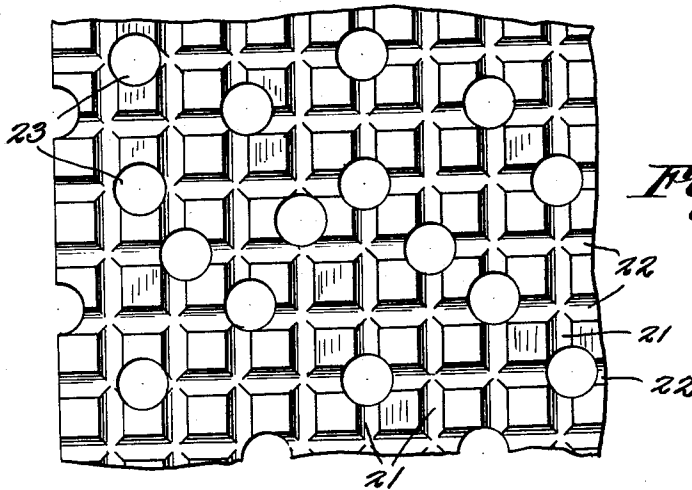


Fig. 9.

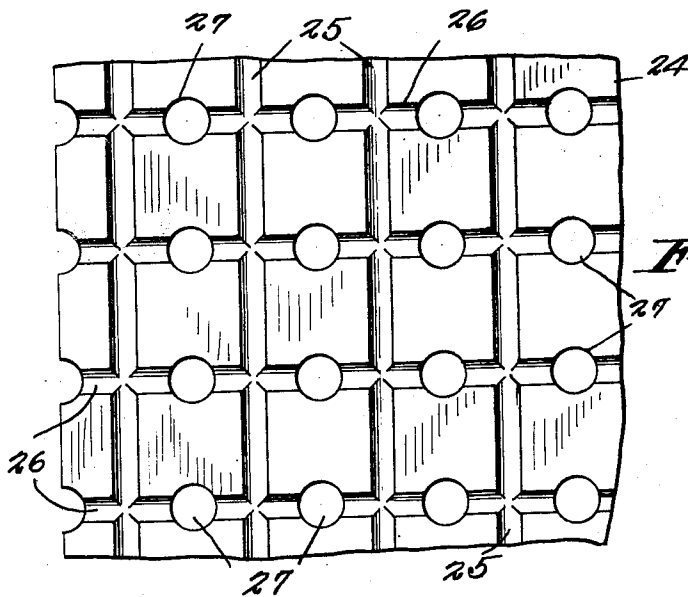


Fig. 10.

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YARN TUBE

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This invention relates to tubes or cores on which yarn to be processed, is wound and supported while dyes or other yarn-treating agents are forced through the yarn.

The primary object of the invention is to provide a tube or core of this character, wherein the yarn or material wrapped thereon will be uniformly exposed to the treatment of the dye or material passing through the tube, to insure an even treatment of the yarn supported on the tube or core.

An important object of the invention is to provide a tube having grooves and perforations arranged so that the perforations intersect one or more grooves, to the end that a greater quantity of yarn-treating fluid may contact the yarn under treatment, which is important when the viscosity of the yarn-treating fluid, is substantially thick.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawing

Figure 1 is an elevational view illustrating a tube constructed in accordance with the invention, the tube having parallel grooves extending longitudinally thereof, the grooves being disposed in the periphery of the tube, and elongated perforations formed to intersect the grooves, the perforations being elongated transversely of the tube.

Figure 2 is a sectional view taken on line 2—2 of Fig. 1.

Figure 3 is a fragmental elevational view illustrating parallel longitudinal irrigating grooves formed in the periphery of a yarn tube, and circular perforations formed in staggered relation with respect to each other, the perforations being disposed within the grooves, and between the grooves.

Figure 4 is a fragmental elevational view of a tube wherein radial peripheral grooves are provided therein, and circular openings formed therein to establish communication between adjacent grooves.

Figure 5 is a fragmental elevational view illustrating the periphery of a yarn tube as formed with radial grooves and elongated openings intersecting adjacent grooves, so that fluid may pass from one groove to another.

Figure 6 is a fragmental elevational view illus-

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trating radial grooves formed in the periphery of a yarn tube, and elongated openings establishing communication between the grooves and interior of the tube, the elongated openings being disposed at acute angles with respect to the axis of the tube.

Figure 7 is a fragmental elevational view illustrating longitudinal spaced grooves formed in the periphery of the tube, and elongated openings disposed at acute angles with respect to the walls of the grooves, the elongated openings establishing communication between the interior of the body portion and grooves.

Figure 8 is a fragmental elevational view illustrating spirally formed peripheral grooves in the tube, and elongated openings arranged in spaced relation with respect to each other and intersecting the grooves, the walls of the elongated openings being extended at right angles to the walls of the peripheral grooves of the tube.

Figure 9 is a fragmental elevational view of a further modified form of the development of the tube.

Figure 10 is an elevational view of a still further development of the invention.

Referring to the drawing in detail, the body portion or tube is indicated by the reference character 5, and as shown, is provided with longitudinal grooves 6 equally spaced, the ends of the grooves terminating in spaced relation with the ends of the tube.

Perforations 7 are formed in the tube, the perforations being transversely elongated and arranged so that they intersect the grooves, the elongated perforations extending through the wall of the tube, establishing communication between the interior of the tube and the grooves. These perforations are arranged in staggered relation with respect to each other, as clearly shown by Fig. 1 of the drawing.

As shown by Fig. 3 of the drawing, the outer surface of the tube is provided with longitudinal spaced grooves 8 providing passageways for the fluid forced through the tube. Circular openings 9 extend through the wall of the tube and are disposed within the grooves 8. Openings 10 which are also circular in formation, are disposed in the ribs formed by the grooves between the grooves, the latter openings also extending through the wall of the tube.

As shown by Fig. 4 of the drawing, annular grooves 11 are formed in the periphery of the tube, and are arranged in spaced relation with respect to each other, longitudinally of the tube. The axes of the annular grooves are in a line parallel with the longitudinal axis of the tubular member. Perforations or openings 12 are formed

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in the wall of the tube and extend through the wall of the tube, certain of the openings being disposed between the grooves so that the openings 12 establish communication between adjacent grooves, as well as between the grooves and the interior of the tube.

In the modified form of the invention as illustrated by Fig. 5 of the drawing, the body portion or tube is provided with annular grooves 13 which are arranged in spaced relation with respect to each other. Elongated perforations 14 are formed in the body portion or tube and are so constructed that they establish communication between adjacent grooves, the ends of the elongated perforations 14 extending appreciable distances into the grooves 13.

As shown by Fig. 6 of the drawing, the annular grooves 15 are arranged circumferentially of the body portion or tube, and elongated perforations 16 are provided and disposed at acute angles with respect to a plane disposed at right angles to the longitudinal axis of the body portion or tube, the elongated perforations 16 being of lengths to extend across the annular grooves, the ends of the elongated perforations extending appreciable distances into the ribs or spaces formed between the annular grooves 15, so that the yarn contacting with the annular grooves 15, may be treated by the fluid forced into the tube.

The grooves 17 as shown by Fig. 7 of the drawing, are disposed longitudinally of the body portion or tube and are arranged in parallel spaced relation with respect to each other. Elongated perforations 18 are formed in the body portion or tube and are disposed in circular lines around the body portion or tube. These elongated perforations are disposed at acute angles with respect to the side walls of the grooves 17, and are of lengths to extend across the grooves, intersecting two or more grooves.

In the form of the invention as shown by Fig. 8 of the drawing, the grooves 19 are formed in the outer surface of the body portion or tube, and are equally spaced and spirally arranged. Elongated perforations 20 are formed in the body portion or tube, and these perforations establish communication between the grooves and interior of the tube. These perforations also extend appreciable distances into the ribs or surface formed between the grooves, as clearly shown by the drawing.

It will of course be understood that the body portion or tube may be constructed of any suitable material, and the size of the grooves and shapes of the apertures may be varied to meet various requirements.

It will also be noted that because of the elongated openings, a more even flow of the treating fluid will be assured, particularly when the fluids are thicker or heavier, as to viscosity.

It might be further stated that while I have shown and described the body portion as tubular in formation, it is to be understood that the body portion may be of any desired hollow construction, such as a cone or the like, without departing from the spirit of the invention.

The width and the depth of the grooves and diameter of the perforations may be varied within the scope of the invention.

As shown by Fig. 9 of the drawing, the tubular body portion is provided with grooves 21 extending longitudinally of the body portion, the grooves being regularly spaced apart.

Annular grooves 22 are also formed in the

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surface of the body portion, and these grooves are arranged in vertical spaced relation with respect to each other, the grooves 22 intersecting the grooves 21 providing regular passageways throughout the surface of the body portion.

Substantially large openings 23 are formed in the body portion and are arranged in predetermined spaced relation with respect to each other, the openings or perforations 23 establishing communication between the interior of the tube and the grooves intersected by the openings 23. These openings 23 are of diameters greater than the width of the grooves 21 and 22, so that the openings 23 establish communication between one or more grooves, depending on the locations of the openings.

In Fig. 10 the body portion which is in the form of a tube, as indicated by the reference character 24, is provided with grooves 25 extending longitudinally of the body portion in predetermined spaced relation with respect to each other.

Grooves 26 are formed in the outer surface of the body portion and are extended at right angles with respect to the grooves 25, the grooves 26 intersecting the grooves 25.

Openings 27 are also formed in the body portion and establish communication between the interior of the body portion and grooves 26, the openings 27 being shown as disposed between the grooves 25.

This construction permits of an even flow of the dyeing fluid regardless of the viscosity of the dyeing fluid, to insure an even dyeing of the thread wound on the tubular body portion.

It might be further stated that the tube forming the subject matter of this invention provides a practical core for supporting filtering material and the device used as a filtering member in oil or other pipe lines.

What is claimed is:

1. A hollow elongated core on which yarn is wound, said core having transversely elongated perforations through its wall structure for fluid passage, and having spaced longitudinally disposed grooves in its outer surface for fluid passage, said perforations being elongated transversely of said longitudinally disposed grooves, the distance across a perforation through and perpendicular to the axis of the perforation in any direction being at least as great as the width of a groove.

2. A hollow core on which textile fibres are wound, said core having elongated perforations through its wall structure for fluid passage, with a plurality of series of grooves in its exterior surface for fluid passage through said core, adjacent grooves of a series being spaced apart, the elongated perforation being greater in length than either the width of the space between adjacent grooves of a series, or the width of a single groove, a perforation which intersects a groove also intersecting the space to one side of a groove between two adjacent grooves without intersecting said two adjacent grooves.

3. A hollow core member having transversely elongated perforations through its wall structure for fluid passage, and having spaced grooves in the exterior wall surface for fluid passage, the length of an elongated perforation being greater than the width of a groove, and being greater than the distance between two adjacent grooves, and intersecting a groove at a 90° angle.

4. A hollow core on which yarn or textile fibers are wound, said core having elongated perfora-

tions through its wall structure, said perforations being disposed in a line, said core having a plurality of grooves in the outer surface thereof communicating with said elongated perforations for fluid passage through the hollow core, the length of a perforation being greater than the width of a groove, and said perforation intersecting a groove and intersecting the space between two adjacent grooves.

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