

[54] APPARATUS FOR TREATING TEXTILES

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[58] Field of Search68/177, 178

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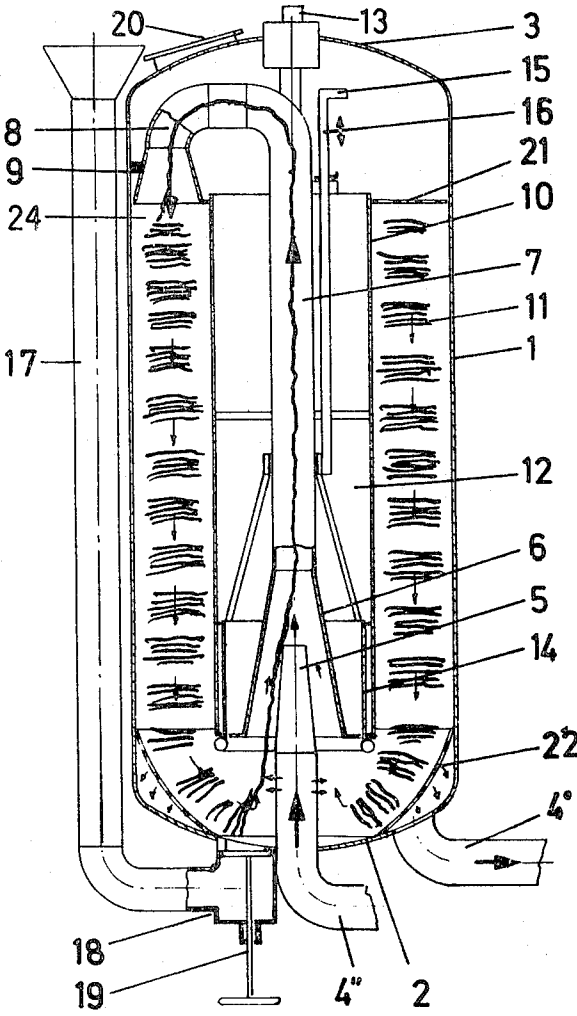
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[57] ABSTRACT

An apparatus for treating textiles in the form of endless ropes or tubes, comprising a container with a central rising pipe and an annular chamber surrounding it, the processing liquor being kept in circulation all through the container and the rope propelled through the rising pipe by means of an injection effect. The rising pipe takes the form of a positioning pipe which rotates or pivots backwards and forwards and during its rotating or pivoting movements brushes across the upper orifice of the annular chamber and lays out the rope conveyed through the positioning tube in loops in the annular chamber. The lower end of the rising pipe is surrounded by an axially displaceable cylindrical port.

2 Claims, 2 Drawing Figures



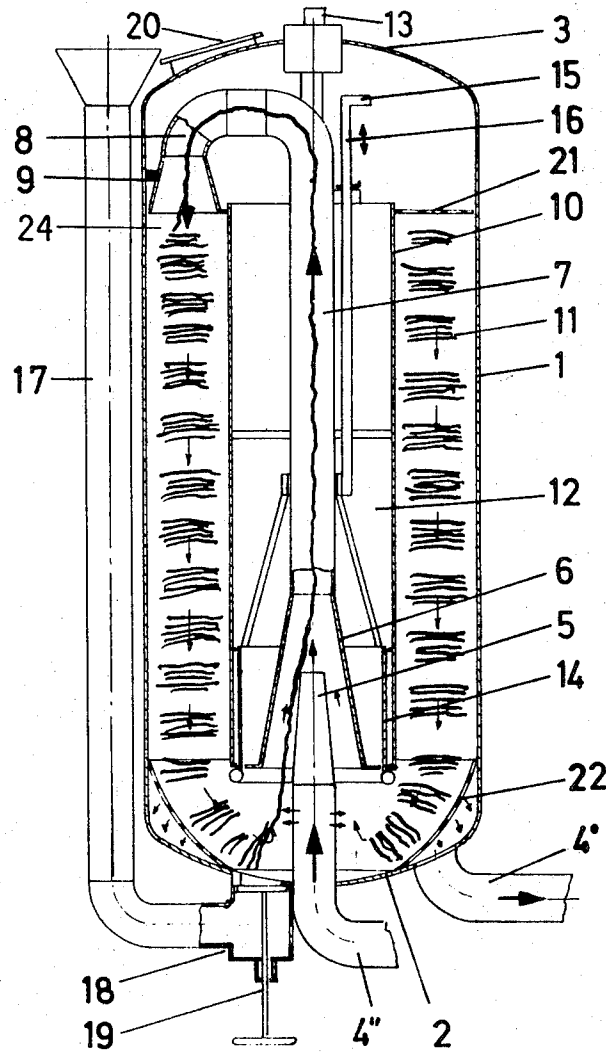


FIG. 1

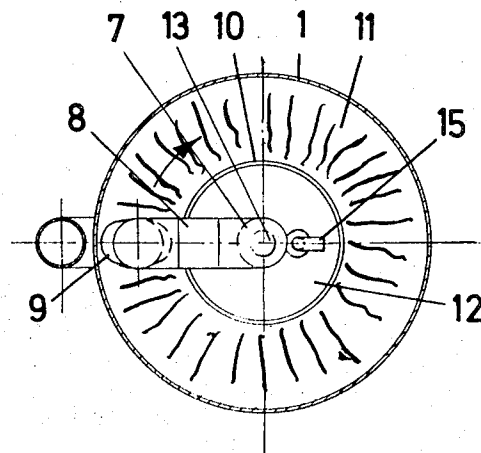


FIG. 2

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APPARATUS FOR TREATING TEXTILES

This invention concerns improvements in or relating to apparatus for treating textiles.

The invention is particularly concerned with apparatus for treating textiles in the form of endless ropes or tubes. The apparatus consists of a container with a central rising pipe and an annular chamber surrounding it. The treating liquor is kept in circulation all through the container and in the process propels the rope through the rising pipe by means of an injection effect.

In the case of apparatus of this kind, difficulties tend to arise in guidance and in the positioning of the rope or tube in the container, and entanglements often arise and lead to damage to the material. The object of the invention is to eliminate these disadvantages.

According to the present invention, an apparatus for treating textiles in the form of endless ropes or tubes comprises a container with a central rising pipe and an annular chamber surrounding it, the rising pipe taking the form of a positioning pipe which is either rotatable or pivots with a backwards and forwards motion and which during its rotational or pivoting movements brushes across the upper orifice of the annular chamber and lays the rope in loops in the annular chamber as it is propelled out of the positioning pipe.

It is an advantage for the lower end of the rising pipe to be surrounded by an axially displaceable cylindrical tubular port.

In this manner a particularly advantageous wet treatment of the textiles is arrived at, entanglement of the rope or tube as it is continuously propelled by the processing liquor being eliminated with reliability. At the same time, the material is constantly supported by the processing liquor, with the result that longitudinal stressing is reduced to a minimum. As the textile material is continuously laid out in loops, the space required in the container is reduced so that larger quantities of textile can be processed at the same time.

In order that the invention may be well understood it will now be further described, though only by way of illustration, with reference to the accompanying drawings, in which:

FIG. 1 is a vertical section through the apparatus, illustrated schematically, and

FIG. 2 is a horizontal section.

The apparatus for the wet treating of textiles in the form of endless ropes or tubes incorporates a vertical cylindrical container 1 with a base 2 and cover 3. Connected to the outer perimeter of the container base 2 is a pipe 4' which is connected to the suction side of a pump not illustrated. The pressure side of this pump is connected to a pipe 4'' which is ducted centrally through the vase of the container and is provided with an exit nozzle 5 which protrudes into the container 1 coaxially. The exit nozzle 5 is surrounded by a tapering jet pipe 6 which forms the lower portion of a central rising pipe 7 which protrudes upwards. The upper end of the rising pipe 7 is curved into a U shape and forms a downward-pointing positioning pipe 8 with an exit nozzle 9. The interior of the container 1 is subdivided by means of a cylindrical pipe 10 into an external annular chamber 11 and an interior chamber 12 which takes the rising pipe 7. In addition, in the upper part of the container a driving shaft 13 is connected to the rising pipe 7, and this is prolonged out of the container 1 and driven by an agency not illustrated. When the rising pipe 7 rotates, the exit nozzle 9 of the positioning pipe 8 brushes across the annular upper orifice 24 of the annular chamber 11. Arranged in the cylindrical pipe 10 is a cylindrical tubular port 14 of smaller diameter than the pipe 10 and capable of being displaced in an axial direction downwards concentrically towards the exit nozzle 5 from the position illustrated.

Displacement is carried out by an actuating gripper 15 protruding upwards, which is connected to the tubular port 14 by means of a lever mechanism 16. Parallel to the rising pipe 7, an exterior pipe 17 is provided and this is curved at the bottom and connected by means of a connector 18 to the base 2 of the container 1. The penetration point to the interior of the container 1 can be closed off by means of a closure element 19.

The apparatus described operates as follows:

The textile material 23 in rope or tubular form is guided through the pipe 17 by means of the rising pipe 7 and the positioning pipe 8 in an upward direction into the container, which is already filled with liquor, and on existing from the nozzle 9 is laid out round the cylindrical pipe 10 in loops on the base 2 of the container 1, the tubular port 14 having previously been excluded downwards as a prolongation of the cylindrical pipe 10. This results in the loops not being laid too closely around the pipe 4''. The end of the textile material is connected to its start so that an endless rope or tube of textile is formed. After the container has been filled with the material to be processed, the tubular port 14 is retracted upwards and assumes the position illustrated. Following this, the pump (not illustrated) is started up and processing liquor is sucked off through the pipe 4' and reintroduced under pressure through the pipe 4'' into the container 1. The liquor leaves the nozzle 5 with considerable velocity and pressure and flows upwards through the rising pipe 7. During this process, the jet of liquor carries along the textile rope or tube ducted through the jet pipe 6 so that the loops formed on the base are reeled out. At the same time, the shaft 13 is also placed under power so that the positioning pipe 8 is turned, for the sake of example in a clockwise direction. As a result of this, the rope leaving the nozzle 9 is again laid out in loops about the pipe 10 in the annular chamber 11. For this purpose, the rate of revolution of the shaft is made adjustable so that the buildup situation can be influenced by altering the rate of revolution.

In a more simple version of the apparatus, the separate drive mechanism can be omitted by positioning the exit nozzle 9 at an oblique angle so that it is rotated by recoil effect.

An important point is that the textile material to be processed makes its exit through a nozzle 9 which becomes broader towards the bottom, as a result of which the material is opened up, laid out in breadth and compressed. For this purpose, the nozzle will preferably be perforated and may be pivotable in form so as to avoid turbulence in the processing liquor. Speed of propulsion is determined by the output of the pump and the size of the nozzles used. As the liquor is sucked off at the base of the device, the textile material is subjected to an additional process of permeation.

Furthermore, radially distributed drillings are provided at the exit point of the pipe 4'' in the interior of the container 1. As a result of which a small portion of the processing liquor leaves the pipe 4'' radially. In this manner sticking of the textile material to the pipe 4'' is obviated and drawing off the fabric web facilitated.

It may further be mentioned that under certain circumstances, e.g., where apparatus is laid out horizontally, it is also possible to fit the rising pipe 7 laterally, i.e., eccentrically, in the container 1. In this case, the pipe with the positioning device 8 does not carry out a full rotational movement but only one of pivoting backward and forward, which however is sufficient for depositing the textile material in loops. Removal of the processed textile material from the container is carried out through an aperture 20 at the top. In order to avoid entanglements in the exterior chamber 11, this is closed off to the top by a perforated plate 21. An additional perforated plate 22 is located in the base 2 in the area of the exit from the pipe 4' and the connector 18.

It is also possible to introduce liquor through the driving shaft to achieve additional acceleration of the material.

Finally, mention should be made of the fact that for the processing of light materials which do not sink in the liquor, it is possible to fit the rising pipe 7 the other way round so that conveyance is from top to bottom. It is also possible to carry out a drying process inside the appliance, especially where solvents are used, by blowing in hot air through the rising pipe. In this case, however, a pair of extraction rollers will be required as an additional element either inside or outside the container.

What we claim is:

1. Apparatus for treating textiles in the form of an endless rope, comprising:
 - a. a container;

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- b. a rising pipe centrally disposed in said container forming an annular chamber between the rising pipe and the container;
- c. injection means for a processing liquor circulated through said container; 5
- d. propelling means to move the textile rope through said rising pipe;
- e. an upper orifice in said annular chamber; and,
- f. said rising pipe including positioning pipe means which 10

pivotably rotates backwards and forwards and brushes across said upper orifice of the annular chamber during its rotating and pivoting movement to thereby lay out said rope in the form of loops in the annular chamber while the rope is conveyed through said positioning pipe means. 2. Apparatus according to claim 1, wherein the lower end of the rising pipe is surrounded by an axially displaceable cylindrical port.

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