

[54] **TEXTILE TREATING DEVICE**
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 68/158, 181 R, 184, 22 R, 85, 38; 100/176; 118/419

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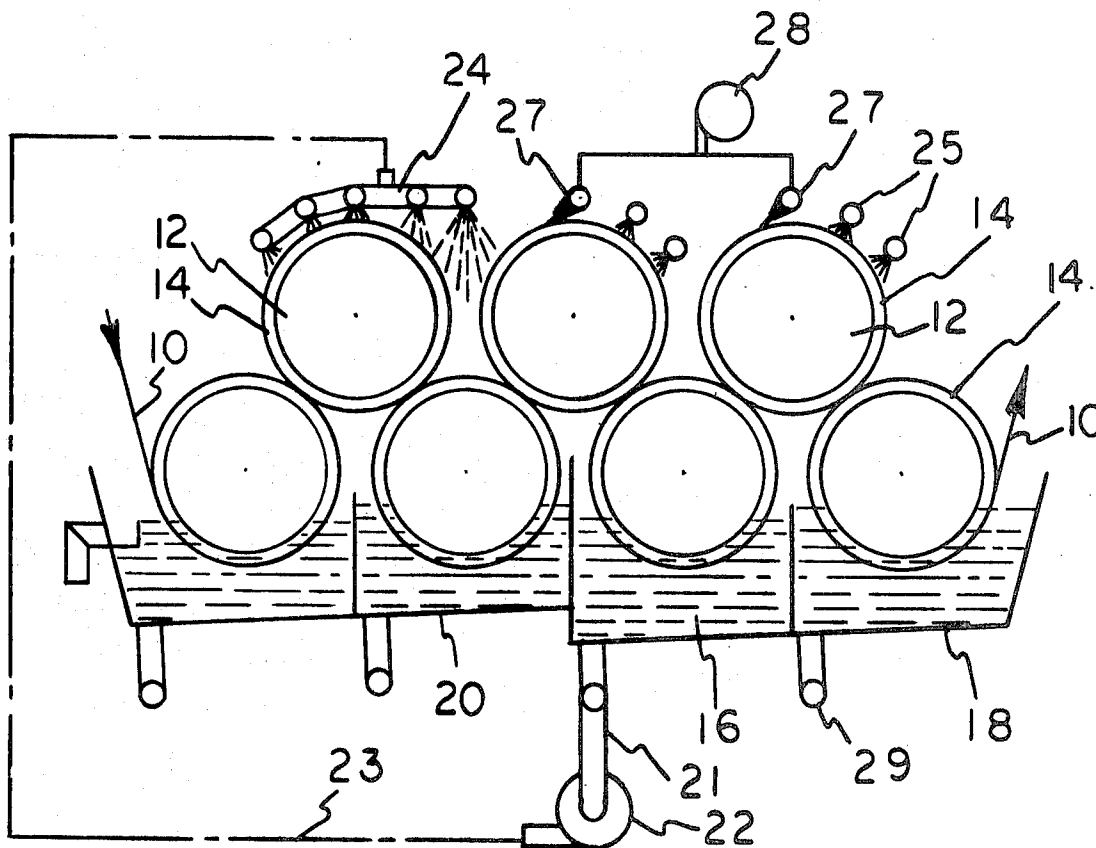
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[57] **ABSTRACT**

A device for treating endless webs including a plurality of rolls aligned to define a path of travel for the web during treatment such that the web is transferred along the path of each succeeding roll. The improvement comprising the invention includes the use of an outer shell on at least one of the rolls, the shell having annular raised portions defining a plurality of ribs and grooves. Also contemplated is the arrangement wherein the path of travel of the web is defined by alignment of at least three rolls wherein the web travels without an unsupported run between the rolls, and each of the rolls has the annular raised portions defining the plurality of ribs and grooves.

3 Claims, 4 Drawing Figures



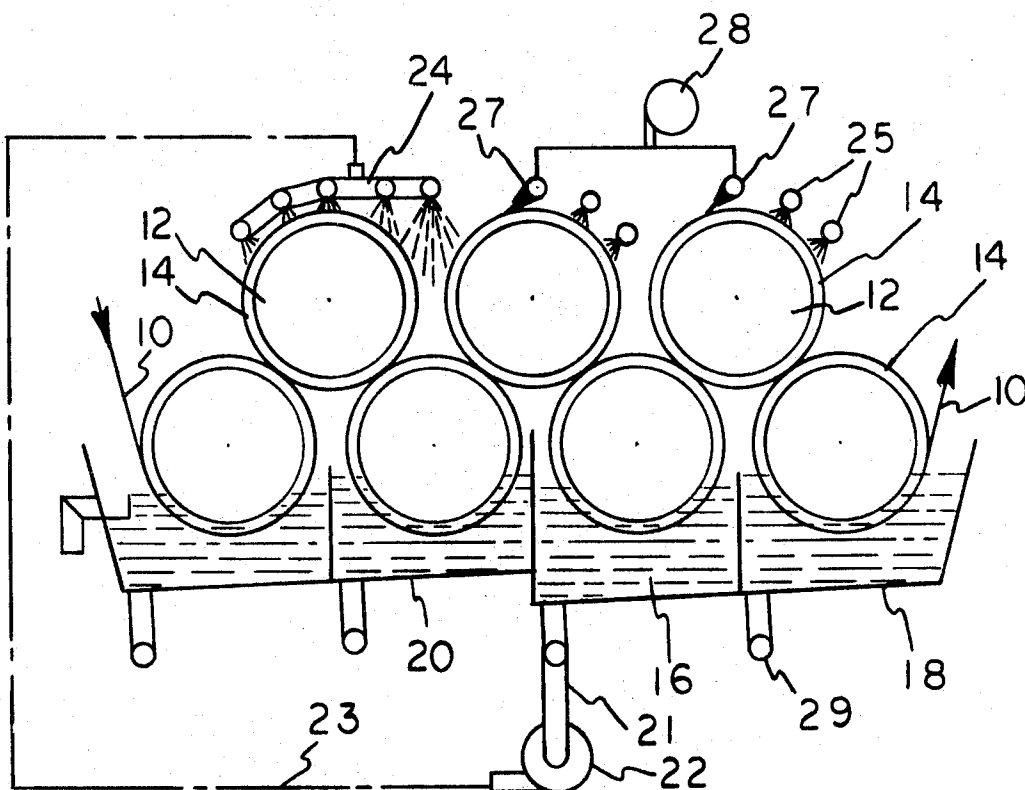


FIG. 1

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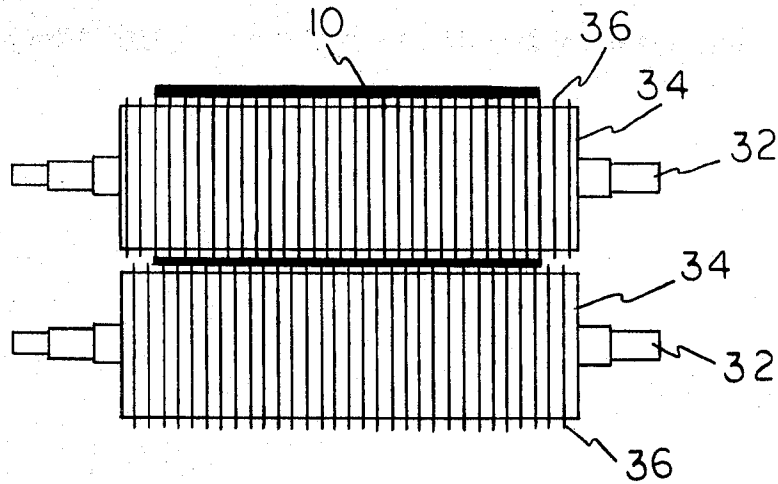


FIG. 2

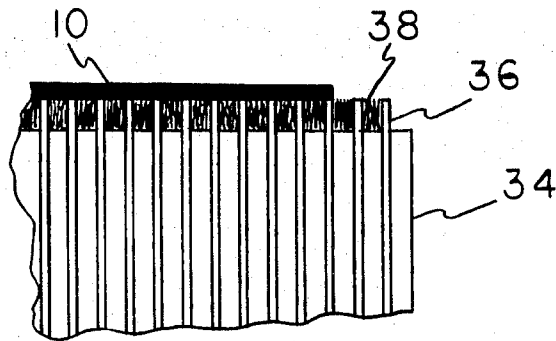


FIG. 3

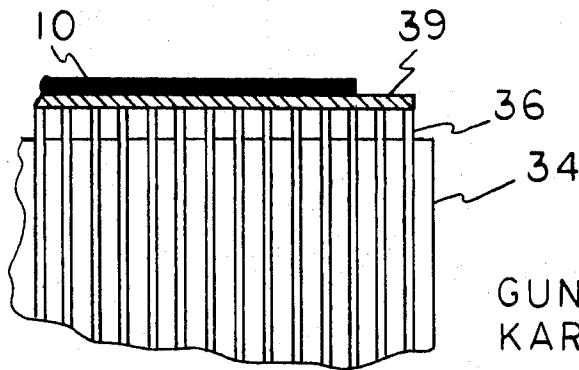


FIG. 4

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TEXTILE TREATING DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to an apparatus for continuous width treatment of textile webs, particularly those having an elastic quality, wherein the webs are washed, steamed, bleached, dyed or otherwise treated, in which the textile web is guided during the treatment with liquid, steam, or solvent in a manner without tension about a plurality of rolls in a product path.

Many devices are known presently for the continuous treatment of endless webs of textiles of other webs. For example, many devices employ rolls or drum groups which may be perforate or screen-like in covering. In addition, conveyor belts or screens and chutes are employed. Most often, the treating medium is applied to the web by immersion of the carrying components in troughs or tanks. In addition, spraying or flooding from the inside or outside of the web may be utilized. Various wet treatment machines may include percussion rolls, vibration devices, ultrasonic equipment and other means to amplify the treatment effect. Doctor rolls and press rolls may be employed to act as squeezing agents. Heating devices and cooling may also be employed to vary the temperature during treatment.

One of the problems incurred in treating textiles in these manners is the resultant tension found in the web. Although the treatment is adequate for the fibers, tension oftentimes causes failure of the web as it passes along the path of travel. Such ruptures of the fabric cause considerable expense and difficulty.

THE INVENTION

It has now been discovered that a useful device for treating endless webs of textiles and other materials may be provided as follows. Basically, the invention includes the concept of providing a plurality of rolls arranged to define a path of travel for the textile web wherein at least one and preferably all of the rolls have a plurality of annular raised portions defining a plurality of ribs and grooves. By grouping the rolls to define a path wherein the rolls are closely associated with each other, so that the ribs and grooves on one roll are staggered in relationship with the ribs and grooves on the other, passage of the textile from one roll to the next is possible without any unsupported span. In addition, treating fluids or gases may be applied to the textile from either or both sides of the web due to the spacing of the grooves.

In a preferred embodiment, annular rings may be placed in the grooves defined by the raised portions of the roll. These rings, being of smaller size than the groove defining ribs, can be manufactured from a brush-like substance of conventional design, such as a brush or loose woven felt, so as to act as a fluid depositing medium on the web.

Conventional sprayed devices, air and fluid doctors, and colored current application of treating solutions in a plurality of vat compartments can be provided to suitably treat the textile. As has been stated above, any arrangement of a plurality of rolls to define a path which is taken by the textile can advantageously employ the concepts of this invention, wherein the rolls contain the raised portions defining the ribs and grooves.

IN THE DRAWINGS

For a more complete understanding of the present

invention, reference is hereby made to the drawings, in which:

FIG. 1 is a schematic representation showing the present invention;

FIG. 2 is a schematic drawing showing other features of the present invention;

FIG. 3 is a schematic drawing in partial sections showing one preferred embodiment of the present invention; and

FIG. 4 is a partial schematic drawing showing a second preferred embodiment of the present invention.

As shown in FIG. 1, an endless textile web 10 is passed along a path defined by a plurality of rolls 12. Each of these rolls 12 have a plurality of raised portions 14 which define ribs and grooves as more fully described hereinafter.

Treating fluid 16 is contained in tanks 18 and 20 and the web is subjected to the treating fluid 16 as it passes over the rolls 12 while being supported by the ribs 14. In one manner of treating the textile 10, as shown in FIG. 1, the fluid 16 may be withdrawn through pipes 21 and returned by pump 22 and line 23 to a header 24 wherein the fluid 16 is sprayed onto the textile. Additional spray nozzles 25 may provide more of the treating solutions 16. Simultaneously, air doctors 27 may be provided to remove fluid being carried by the web 10 just prior to addition of fresh treating solution through spray devices 25. Additional recirculation may be optionally provided by withdrawing fluid from drain 29 and employment of pumps (not shown) similar to pump 22.

Thus it can be seen that the web 10 passes over a plurality of drums or rolls 12 and is carried by the raised rib portion 14 of the rolls. By placement of the rolls 12 in close proximity to one another, the web 10 does not travel over an unsupported span through the entire treating operation. Many conventional treating processes may be carried out by the above described invention.

As shown in FIG. 2, the rolls are supported by journals 32. The shell portions 34 contain a plurality of raised portions 36 defining a plurality of ribs and grooves. The web 10 passes over the surface of the rolls and is supported by ribs 36 which, as shown in FIG. 2, are spaced radially sufficiently to provide clearance for the web 10. By staggering the location of the ribs 36 of the roll shells 34, as shown in FIG. 2, extremely close cooperation between the two rolls may be achieved so as to completely eliminate any unsupported runs as the web passes from one roll to another.

In FIG. 3, a preferred embodiment of the present invention is shown, wherein the portions of the roll 34 between the grooves 36 are filled with brushes 38, so as to effect more rapid transfer of the treating fluid into the web 10 being treated.

In FIG. 4, a porous plate 39 has been placed on top of the ribs 36 of roll 34, so that fluid entrained in the grooved portion of the roll 34 will pass through perforations in the roll 39 and contact the web 10 being treated. Such a porous covering 39 may be employed when some nip pressure is experienced by the web 10 as it is carried by the roll 34 on the ribs 36.

Various modifications of the present invention will permit adaptation of the present invention to a wide variety of textile treating processes. In any instance where a plurality of rolls define a path of travel of the web during treatment, it is possible to provide annular

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raised portions defining a plurality of ribs and grooves so as to more effectively treat the fluid.

Having thus described the invention, what is claimed is:

1. In a device for treating endless textile webs and including a plurality of rotatable rolls aligned to define a circulatory path of travel for said web during continuous width treatment thereof, whereby said web is guided free of tension and is transferred along said path on each succeeding rotatable roll, the improvement therewith comprising:

an outer shell on at least one of said rolls having annular raised portions thereon alternately defining a plurality of ribs and grooves spaced close to each other so that rolls are free from squeeze rolling upon each other at location of the grooves, said shell including brush means placed within said grooves and extending towards the exterior of said ribs.

2. In a device for treating endless textile webs and in-

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cluding a plurality of rotatable rolls aligned to define a circulatory path of travel for said web during continuous width treatment thereof, whereby said web is guided free of tension and is transferred along said path on each succeeding rotatable roll, the improvement therewith comprising:

an outer shell on at least one of said rolls having annular raised portions thereon alternately defining a plurality of ribs and grooves spaced close to each other so that rolls are free from squeeze rolling upon each other at location of the grooves, a porous plate means being attached to said ribs to act as an outer shell of said roll.

3. The improvement in a device according to claim 2 wherein at least three rolls are provided to define a path of travel wherein said web travels without an unsupported run between said rolls, said rolls each having said outer shell having annular raised portions defining said plurality of ribs and grooves.

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