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 [31] **G 50,717**

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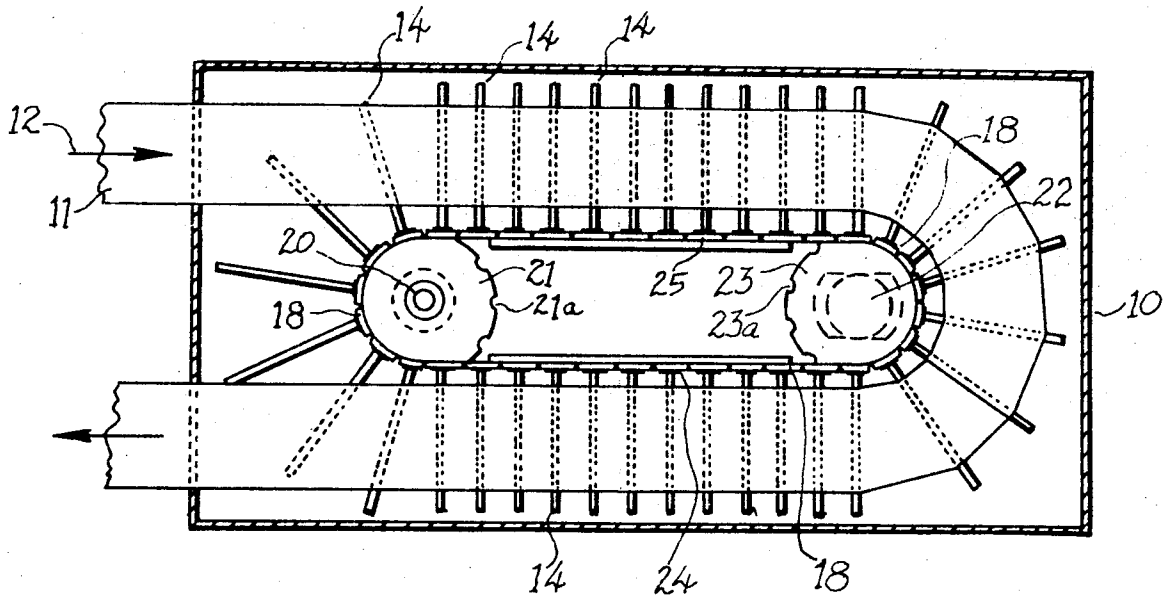
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[54] **DEVICE FOR CARRYING LOOPED TEXTILES**
4 Claims, 5 Drawing Figs.

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ABSTRACT: A device for carrying textiles in a looped position through a chamber having an inlet and an outlet. The device includes a vertical drive column and a vertical tension column with a chain wrapping the upper portion of these columns. A pair of wheels are included, one being attached to each of the columns and adapted to engage the chain and support the chain. In addition, a pair of parallel guide means between the columns are provided to guide and support the chain between the columns. Extending from the chain are a plurality of rod means attached to at least a portion of the length of the chain. The major portion of the rod means extends outward of the chain so that the rod means are adapted to carry the textile in a looped position.



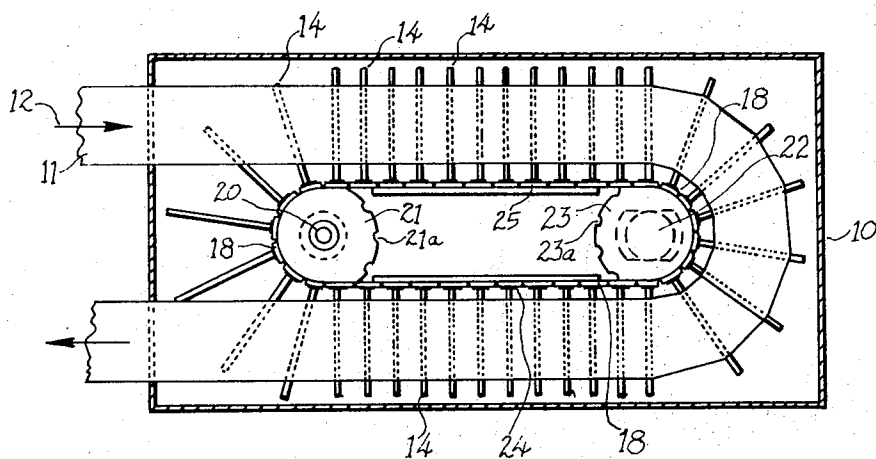


FIG. 1.

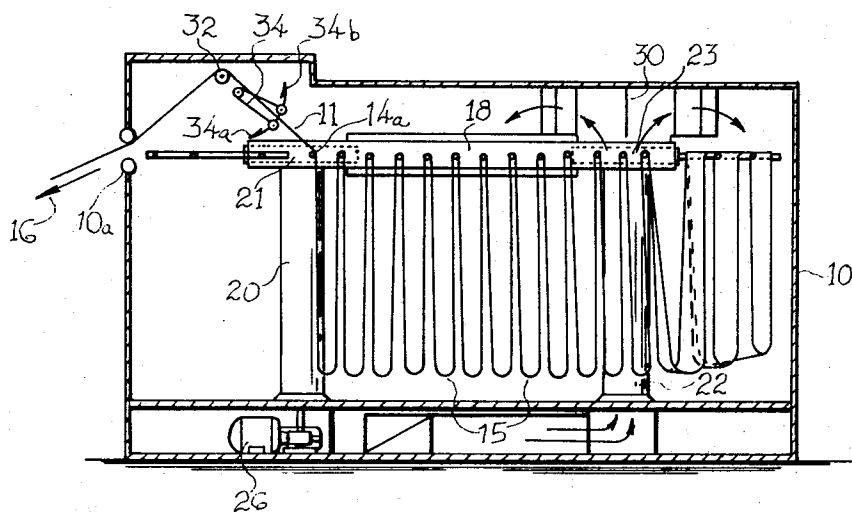


FIG. 2.

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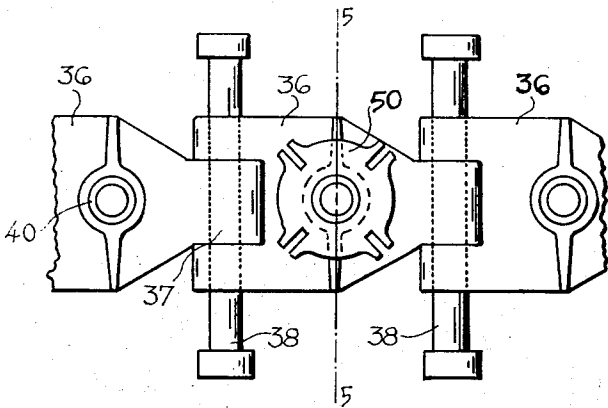


FIG. 3.

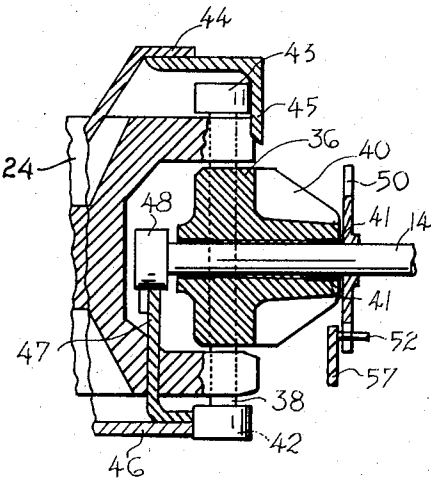


FIG. 5.

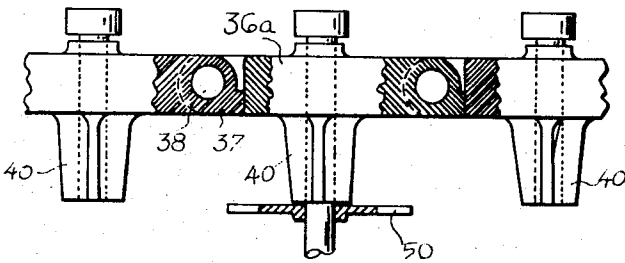


FIG. 4.

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DEVICE FOR CARRYING LOOPED TEXTILES

THE INVENTION

The invention relates to devices for treating textiles in which loops of textiles are suspended in steaming apparatus, dryers, or other treating chambers so that full width textiles are carried horizontally in a path. The discharge for the product is most often on the same side of the device as the product inlet.

In prior art devices of this type, it has been the practice to have the carrying rods attached to the device at both ends with ropes, chains or other carrying means. The difficulty which has been found in this respect arises when the carrying rods are transferred to change direction. Oftentimes, it is difficult or even impossible to reverse the direction of travel of the carrier rods without having the textiles slip off of the carrying rod. Complicated designs have been developed in the prior art to accomplish this, including a reversing means having a cam type device which clamps the rods, lifts them slightly, and positively pivots them around a half circle, thereafter releasing the rods again on the rope or cable carrying means.

These carrier rod guides have a number of disadvantages. For example, it is difficult to maintain the spacing of the carrier rods on the cables in uniform distances, particularly when there is an uneven product pull. Moreover, this design is expensive due to the numerous reversing pulleys and tension elements for the carrier cables, as well as because of the complicated reversing and gripping installation involved. Moreover, the portion of the textile draped over the rods remains constant and, since it does not change, marks are inevitable in the case of dyeing of goods. In other treating processes, creases or marks are shown where the goods are carried on the rod.

The present invention is admirably suited to obviate the above disadvantages. The carrier rods are mounted on only one end on a twist free endless chain or other rotating member, whereby the chains are carried in the straight path of the track in grooves, guide rods or the like. When the direction of the travel of the rods is reversed, the chain itself is engaged by wheels mounted on the columns so that the end of the portion of the carrier rod extending outward of the chain is freely suspended. The rods upon which the textile is carried are rotatably mounted in the chain so that, upon contact with stop pins protruding into the path, the rods may be rotated by approximately 90°, so that the points of adherence of the product to the rods continues to travel in small increments. Both of the columns supporting the device, the drive column and the tension column, are arranged vertically on a central axis in such a manner so as to provide a straight path for the endless chain while simultaneously permitting circulation of air through either one or the other column. Moreover, in a further embodiment of the present invention, it is possible to maintain a proper ratio of the speed of the textile to the speed of the chain so as to provide uniform treatment for all of the fabric being treated.

Other advantages of this invention will be apparent to those skilled in the art from the following detailed description of the annexed sheets of drawings, which by way of preferred example, illustrate one or more embodiments of the invention.

In the drawings:

FIG. 1 shows a top view of the carrying device of the present invention;

FIG. 2 shows a side view of the present invention;

FIG. 3 shows a detailed side view of a preferred chain;

FIG. 4 shows a top view of the chain shown in FIG. 3, partially cut away; and

FIG. 5 shows a partially cutaway view showing a preferred means for mounting the chain with the rod means in parallel tracks.

As shown in FIG. 1, the textile 11 enters the device 10 in the direction shown by arrow 12 and engages a series of rods 14 which are suspended in a horizontal plane near the top of the device 10. The textile 11 exits from the device 10 at the same end as it enters and exits in the direction shown by arrow 16.

As the textile 11 enters the device 10, it is carried by the rods 14 in a looped position 15 as shown in FIG. 2.

The rods 14 are carried on an endless chain 18 which passes about a vertical drive column 20 and a vertical tension column 22. At the top of the columns 20 and 22, wheels 21 and 23 are mounted to engage the chain 18 as it passes around the columns 20 and 22. In this embodiment, the wheels 21 and 23 are provided with a plurality of notches 21a and 23a which are adapted to engage and support the chain 18. Positioned between the wheels 21 and 23 are a pair of parallel guide means 24 and 25 which are adapted to carry the chain 18 in a parallel position between the wheels 21 and 23. Finally, drive means 26 are provided to rotate a drive column 20, which in turn rotates the wheel 21 to cause the chain 18 to rotate and thereby cause the rod means 14 to carry the textile 11 in the direction shown by arrows 12 and 16.

In another embodiment, it is possible to subject the textile being passed through the device to an atmosphere for treating this textile. As shown in FIG. 2, an atmosphere inlet 28 leads to a passage 29 passing through the tension column 22 and out through an outlet 30 which disperses the atmosphere within the device 10. Of course, the drive column 20 or both vertical columns could be provided with the atmosphere passage. In addition, either of the two columns could be adapted to serve as the drive column.

Thus it can be seen that a textile may be introduced into a device as shown in FIGS. 1 and 2, carried by the device in a looped position through a controlled atmosphere, and withdrawn from the device at the same end of the device that the textile was introduced.

In another embodiment it is a relatively simple matter to control the speed of a textile exiting from the device with respect to the speed of the chain rotating the textile in the looped position. As shown in FIG. 2, the textile is withdrawn in the direction shown by arrow 16. As the textile 11 is withdrawn from the rod 14, it passes over a reversing roller 32 first upward and then down out through the exit 10a. As the textile leaves the rod 14a and passes over reversing roller 32, it passes through a pivotal scanning fork 34 which is movable in the direction shown by arrows 34a and 34b. If the endless chain operates too fast in relation to the discharge of material, the section of material moving upward moves more steeply and the fork 34 is pressed downward in the direction of arrow 34a. As a result of this movement, a Servo motor (not shown) is switched to control the drive motor 26 so that the rotation of the chain is maintained at the proper relationship to the speed of material. Conversely, the section of material becomes flatter as the chain operates too slow in relation to the discharge of the material whereby the scanning fork 34 moves in the direction of arrow 34b to reverse the action of the Servo motor. At all times, the rotation of the endless chain is maintained at a proper relationship with the speed of the material being processed.

The present invention also contemplates a particular design for the chain and the parallel guide means upon which the chain is carried between the respective rotating wheels. As shown in FIG. 3, the chain comprises a plurality of links 36 which are fastened together by pins 38. As shown in FIG. 4, the portion 37 of the link 36 which is joined by the pin 38 to the next succeeding link 36a so that the individual chain link bears down against the next succeeding chain link to permit the chain to flex only in a direction inward of the chain. Also fitted in the chain links 36 are journals 40 which are adapted to hold the rods 14 as shown in FIG. 5. Friction bearings 41 may be provided to firmly grip the rods 14 in the journal 40.

To further provide for the support of the chain carrying the rods through the guide means between the rotating wheels, a particular design of the guide means is shown in FIG. 5. The pins 38 which connect the links 36 as shown in FIG. 3 are provided with roller means 42 and 43. The guide means 24 is fitted with an upper track 44 having a guide portion 45 which contacts roller 43 on pin 38 to resist a bending moment caused by the weight of the textile on the rod 14. Similarly, the guide means 24 is provided with a lower track 46 which rests against

roller means 42 to additionally resist the bending moment caused by the weight of the textile on the rod 14. Similarly, the rod 14 contains a roller 48 which rests on a lower guide 47 attached to the lower track 46 of the guide means 24. Thus it can be seen that the chain links 36 are suitable for carrying the rods 14 and the textiles looped thereon in a supported fashion, leaving one end of the rod 14 completely free from any support.

In a further embodiment of the invention, the apparatus is adapted to permit incremental rotation of the rod means to thereby intermittently alter the position of the textiles carried thereon. This is shown in FIGS. 3, 4 and 5 wherein a means for incrementally rotating the rod 14 is represented by a rotation means 50 which, as shown in FIG. 3, may be shaped in the form of a Malta Cross or other radially extending spindle shape suitable for these purposes. The rotation means 50 is fixedly mounted directly on the rod 14 and is positioned so as to contact pin 52 which in turn is attached to the guide means 24 by an extension 53. As the rotation means 50 contacts the pin 52, and thereby meets resistance, the pin 50 rotates approximately 90° as it is driven past the pin 52. Rotation of the rotating means 50 causes rotation of the rod 14 in a similar fashion since the rotation means 50 is fastened securely to the rod 14. Thus as the rod 14 pivots a small incremental amount, the textiles looped thereon are transferred an incremental amount to avoid any problems of creasing or spotting. By providing a plurality of pins 52 along the guide means 24 and 25, a plurality of incremental movements of the rod means 14 will be effected, thereby intermittently altering the position of the textile on the rods.

Other embodiments of the invention will become apparent to those skilled in the art upon a reading of the instant disclosure.

We claim:

1. A device for carrying textiles in a looped position through a chamber comprising:
 - a vertical drive column;
 - a vertical tension column;
 - a chain means wrapping the upper portion of each of said columns, said chain having a plurality of links;
 - a pair of wheel means, one attached to each of said columns and adapted to engage said chain and support said chain;
 - a pair of parallel guide means between said columns and adapted to guide and support said chain between said columns;
 - a plurality of horizontal rod means attached to at least a portion of said links of said chain such that the major portion of said rod means extends outward of said chain, whereby said plurality of rod means are adapted to carry said textile in a looped position;
 - drive means adapted to drive said vertical drive column; and
 - control means for regulating the speed of said chain with respect to the speed of the textile being introduced to thereby provide relatively uniform loops; said control means including sensing means to measure changes in the speed of said textile, said sensing means being operably

connected to said drive means to adjust the speed of said vertical drive column, whereby the speed of said chain is adjusted in proportion to the changes in speed of said textile.

2. A device for carrying textiles in a looped position through a chamber comprising:
 - a vertical drive column;
 - a vertical tension column;
 - a chain means wrapping the upper portion of each of said columns, said chain having a plurality of links;
 - a pair of wheel means, one attached to each of said columns and adapted to engage said chain and support said chain;
 - a pair of parallel guide means between said columns and adapted to guide and support said chain between said columns;
 - a plurality of horizontal rod means attached to at least a portion of said links of said chain such that the major portion of said rod means extends outward of said chain, whereby said plurality of rod means are adapted to carry said textile in a looped position;
 - drive means adapted to drive said vertical drive column; and
 - wherein said plurality of said links include upper and lower roller means adapted to cooperatively move along said parallel guide means, and journal means adapted to support said rod means, each of said links being pivotally attached to the next succeeding link such that said link is adapted to pivot only in a direction inward of said chain.
3. The device of claim 2, wherein said rod means are adapted to supportably pass through said journal means of said links of said chain such that one end of said rod means extends interiorly of said chain means, said one end of said chain means extending interiorly of said rod means further having roller means thereon, said roller means being adapted to cooperatively move along said parallel guide means.

4. A device for carrying textiles in a looped position through a chamber comprising:
 - a vertical drive column;
 - a vertical tension column;
 - a chain means wrapping the upper portion of each of said columns, said chain having a plurality of links;
 - a pair of wheel means, one attached to each of said columns and adapted to engage said chain and support said chain;
 - a pair of parallel guide means between said columns and adapted to guide and support said chain between said columns;
 - a plurality of horizontal rod means attached to at least a portion of said links of said chain such that the major portion of said rod means extends outward of said chain, whereby said plurality of rod means are adapted to carry said textile in a looped position;
 - drive means adapted to drive said vertical drive column; and
 - wherein at least one of said vertical columns are hollow, said hollow column being adapted to receive a conditioned atmosphere and distribute said atmosphere in said chamber.