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3,465,554

CLOTH RETAINING FLANGE FOR DYE BEAM

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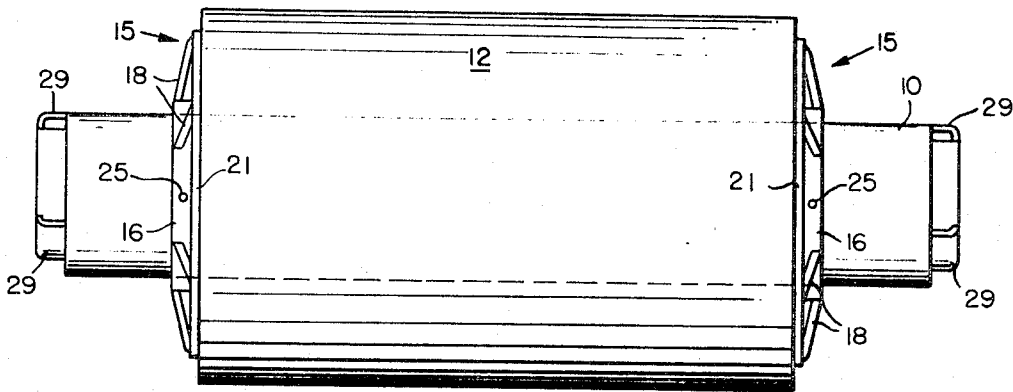


FIG. 1

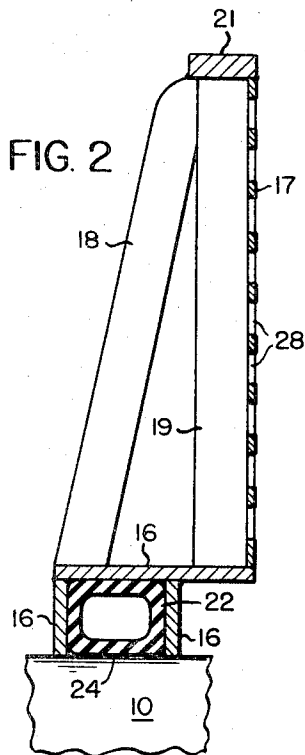


FIG. 2

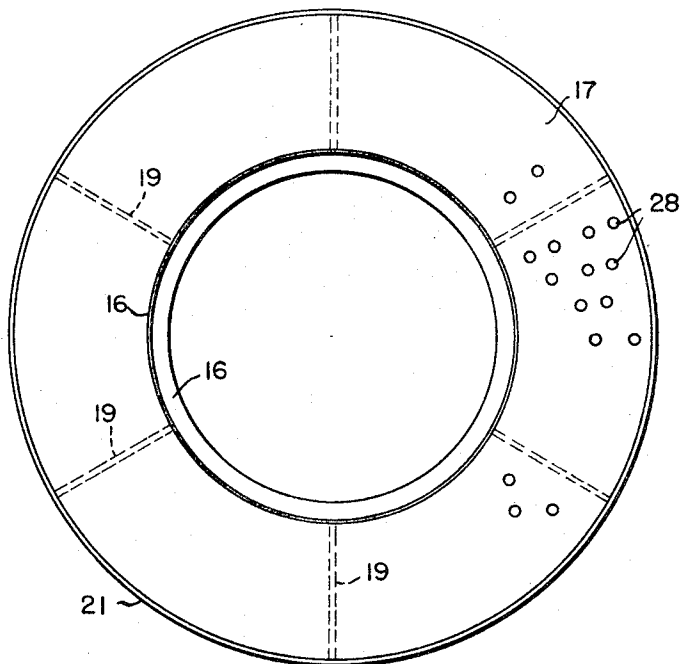


FIG. 3

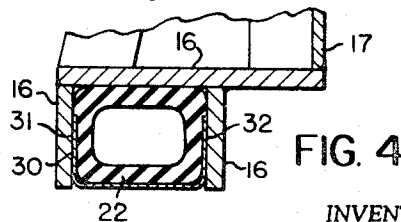


FIG. 4

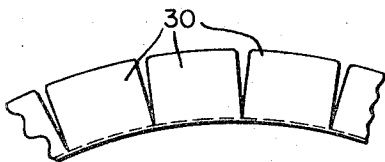


FIG. 5

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CLOTH RETAINING FLANGE FOR DYE BEAM

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5 Claims

ABSTRACT OF THE DISCLOSURE

The flanges disclosed for retaining a roll of cloth on a dye beam during dyeing have channeled hubs in each of which a rubber tube is mounted. The tubes engage the periphery of the beam or shaft, and are filled with compressed air to clamp the flange in abutment with the roll of cloth at one end thereof and against movement on the beam. To prevent wear of the tubes, U-shaped thin metal protectors may be interposed between the tubes and the confronting peripheral surface of the beam.

The present invention relates to apparatus for use in dyeing fabric, and more particularly to cloth retaining flanges for dye beams or rolls.

In dyeing cloth one practice is to wind the cloth on a hollow shaft or beam, and to pump the dye solution through the fabric as the beam is revolved in, for instance, a dye vat. One difficulty with this process previously has been that, as the circulating pumps force the dye liquid through the perforated beam, the different layers of cloth wound on the beam tend to shift on one another axially of the beam. To prevent this, cloth retaining flanges have been secured to the beam at opposite sides of the wound fabric to engage the ends of the fabric roll, and prevent axial shift of the layers of cloth on the roll or beam.

Heretofore, the flanges were made in pieces, each flange consisting, for example, of a number of solid arcuate plates bolted together, or comprising a ring secured to a spider. The assembled flanges were threaded on the ends of the beam rolls to abut the ends of the roll of cloth wound on the beam.

One drawback of the prior construction was the time that it took to assemble the arcuate plates on the spiders or hubs and to disassemble them therefrom. Another disadvantage was that because wrenches or other similar tools were required in assembly and disassembly of the beam flanges there was always the danger that the fingers or hands of the operators might be injured. Still another drawback was the heavy weight of the beam flanges. Still further, because the beam flanges were solid, there was always the possibility that the edges of the fabric would not be dyed uniformly with the main body of the fabric.

One object of this invention is to provide a dye beam flange that can be assembled on, or disassembled from, the dye beam in seconds as compared with the minutes required for assembly and disassembly of the previously known beam flanges.

Another object of the invention is to provide a dye beam flange which can be assembled on a dye beam, or disassembled therefrom without the use of any wrenches or other special tools.

Another object of the invention is to provide a dye beam flange construction which will insure against injury to the hands of fingers of operators.

A further object of the invention is to provide a dye beam flange which will be of lighter weight than known prior such flanges, and therefore, easier to handle.

Still another object of the invention is to provide a dye beam flange which will permit free flow of the dye liquid from the center of the fabric roll to the outside thereof without being restricted at the ends of the roll.

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Other objects of the invention will be apparent hereinafter from the specification and from the recital of the appended claims, particularly when read in conjunction with the accompanying drawings.

In the drawings:

FIG. 1 is a side elevation of a dye beam having cloth retaining flanges assembled thereon made according to one embodiment of this invention;

FIG. 2 is a fragmentary radial sectional view on an enlarged scale through a dye beam flange made according to this embodiment of the invention, showing, also, fragmentarily a portion of the dye beam itself;

FIG. 3 is an end elevation of this flange;

FIG. 4 is a fragmentary end view of a guard which may be provided for protecting the rubber tube retaining ring of the flange; and

FIG. 5 is a fragmentary radial sectional view showing the guard in position protecting the tube.

Referring now to the drawings by numerals of reference, 10 denotes a dye beam; and 12 designates a roll of cloth, wound thereon to be dyed. Two cloth retaining flanges made according to one embodiment of this invention are shown at 15. These are mounted on the dye beam 10 to abut, respectively, against opposite ends of the cloth roll 12.

Each flange 15 comprises a hub portion 16, and a disc portion 17. The hub and disc portions of each flange are connected by reinforcing ribs 18 and 19. Ribs 18 are inclined to ribs 19 and welded at their inner ends to hub 16 and at their outer ends to ribs 19. Ribs 19 are welded at their inner ends to hub 16 and at their outer ends to ring 21. Each flange comprises, therefore, a unitary structure.

The hub portion 16 is formed with a channel that receives and holds a pneumatic tube 22 which may be made of natural or synthetic rubber or any plastic material impervious to leakage of air. Tube 22 is ring-shaped; and each flange is positioned on the beam so that the inside 24 of its tube fits around the periphery of the beam. A conventional tire valve 25 (FIG. 1) is secured to each tube and passes through a hole in the hub 16 of the flange so that air under pressure can be supplied to the tube to clamp the tube and the flanges to the beam in any adjusted position along the length of the beam.

The disc portion 17 of each flange is perforated, as denoted at 28, to permit free flow of the dye liquid through the flange to insure the dyeing of each convolution of the fabric roll 12 up to its very edges.

In use, the two flanges 15 are slipped on the beam 10 after the cloth has been wound on the beam, and the disc portions 17 of the two flanges are cloth. Then air under pressure is supplied to the tubes 22, expanding the tubes against the periphery of the shaft or beam 10 to hold the flanges in place on the shaft or beam against axial movement thereon. The cloth wound in the roll 12, therefore, will be held against axial movement on the beam.

Hooks 29 are provided on the beam for transporting the beam (empty or loaded) by a hoist or crane.

The flanges can be made either of welded steel parts, the disc portions of which are perforated, or can be made of expanded metal.

The perforations in the plates not only allow the dye to flow to the very edges of the layers of cloth with the result that a better dyeing job is done at the edges of the cloth than was possible with prior flanges, but these perforations also relieve the pressure tending to force the flanges along the beam axially.

Preferably the air clamp retaining ring is made of stainless steel.

To prevent damage to and wear of the rubber tubes, inverted, U-shaped metal protectors 30 may be disposed in the channels 20 to cover the face 24 of the tube and the sides 31 and 32 thereof. These protectors are made of very thin stainless steel, and are disposed, as shown in FIG. 5, in contiguous relation about the axis of each flange.

Beam flanges constructed according to the present invention are lighter in weight, and therefore, easier to handle than conventional beam flanges. Their construction insures against injury to the hands and fingers of the operators of the dyeing equipment, since no wrenches or other tools are required in assembling the flanges on the dye beams, or removing them therefrom. They can be assembled on and disassembled from the dye beam in seconds as compared with the several minutes required for assembling and disassembling conventional dye beam flanges. Edge dyeing of the fabric is improved because of the perforations in the flange faces; the dye liquid is free to flow from the center of the fabric roll to the outside surface thereof without being restricted at the ends of the roll.

While the invention has been described in connection with use thereof on dye beams, it is not limited to such use. It may be employed, for example, also on wrap beams of looms, and elsewhere particularly in the textile industry.

While the invention has been described in connection with a specific embodiment thereof, it will be understood, then, that it is capable of further modification, and this application is intended to cover any variations, uses, or adaptations of the invention and including such departures from the present disclosure as come within known or customary practice in the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth, and as fall within the scope of the invention or the limits of the appended claims.

Having thus described my invention, what I claim is:

1. A cloth retaining beam flange having:

a disc portion adapted to abut against the end of a roll of cloth on a beam, and
a hub portion adapted to seat around the beam, said hub portion having a channel therein surrounding the periphery of the beam, and
a pneumatic tube in said channel for engagement with said periphery to secure the flange against movement on said beam.

2. A cloth retaining beam flange as claimed in claim 1, having a valve mounted thereon to admit compressed air to and exhaust air from said tube.

3. A cloth retaining beam flange as claimed in claim 1, wherein said disc portion is perforated to permit flow of a dye liquid to the ends of the cloth roll when the beam is being used to hold a cloth roll on the beam during dyeing of the cloth.

4. A cloth retaining beam flange as claimed in claim 1, having a plurality of thin channel-shaped flexible guard members secured in said channel to be interposed between said tube and the periphery of said beam to protect said tube against wear.

5. A cloth retaining beam flange as claimed in claim 4, wherein said guard members are U-shaped and are disposed in said channel with their ends abutting and with their bight portions interposed between said tube and the periphery of the beam and their sides interposed between said tube and the sides of said channel.

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U.S. Cl. X.R.

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