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APPARATUS FOR LIQUID TREATMENT OF A WEB OF FABRIC

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FIG. 1.

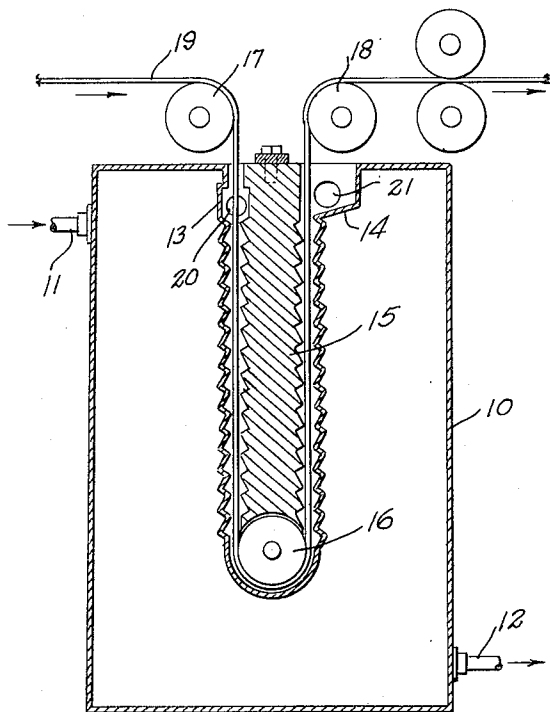


FIG. 2.

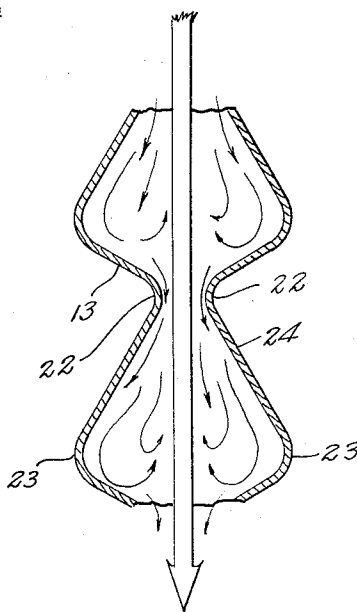
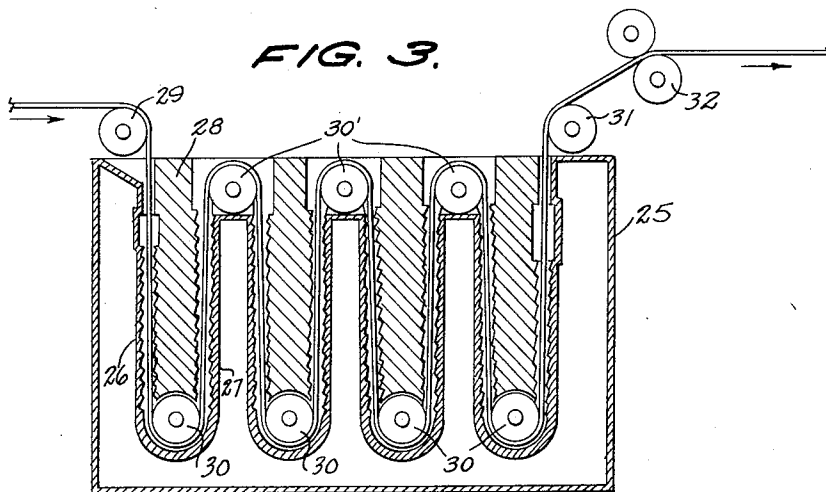


FIG. 3.



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## APPARATUS FOR LIQUID TREATMENT OF A WEB OF FABRIC

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1 Claim. (Cl. 68—175)

The present invention relates to apparatus for dyeing a continuous web of fabric.

The primary object of the present invention is to provide means for creating greater turbulence in the treating liquid contacting the traveling web of fabric in a continuous dyeing apparatus.

Another object of the present invention is to provide means creating better penetration of a fabric web by the treating liquid in a continuous dyeing apparatus.

These and other objects and advantages of the present invention will be fully apparent from the following description when taken in connection with the annexed drawings, in which:

Figure 1 is a side view partially in cross-section of a dyeing apparatus in simplified form having a single well.

Figure 2 is a greatly enlarged view in detail showing the configuration of the facing walls of a well and face of a baffle and a web of fabric traveling therethrough, the direction of flow of the liquid being indicated by arrows, and

Figure 3 is a side view in cross-section of a multiple well dyeing apparatus constructed according to the present invention.

Referring in greater detail to the drawing, a tank is shown in Figure 1 as indicated by the reference numeral 10, the tank 10 having an inlet for steam or hot water indicated by the reference numeral 11 and an outlet 12.

A well is provided having a first wall 13 and a second wall 14 joined together at the bottom, the walls 13 and 14 being substantially parallel with each other and extending vertically within the tank 10.

A baffle 15 is suspended from the upper end of the tank within the well formed by the walls 13 and 14 and has its lower end adjacent to a horizontally disposed feed roller 16. Other rollers 17 and 18 are horizontally disposed adjacent the upper end of the tank for feeding and carrying a web of fabric indicated by the reference numeral 19 in the direction of the arrow into the well between the walls 13 and 14 and the opposed faces of the baffle 15.

An inlet 20 is provided for treating liquid in one side of the well and an outlet for the spent liquid indicated by the reference numeral 21 is provided at the other end of the tank.

The present invention consists of providing serrations in the adjacent walls of the well and the faces of the baffle to form a tortuous path or passage for the treating liquid on each side of the web of fabric 19. The detail of the configurations of each of the walls and the opposed faces of the baffle 15 are shown greatly enlarged in Figure 2.

The serrations in the wall 13 and in the wall 14, the latter being oppositely formed from those in the wall 13, form high points indicated in Figure 2 by the reference numeral 22 and low points indicated by the reference numeral 23. The face 24 of the baffle 15 is opposite to the wall 13, in Figure 2, and the high point 22 and the low points 23 are in registry with each other. The portion of the wall and face immediately following the high points 22 diverge outwardly with respect to the longi-

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tudinal axis or the plane of the well wall and baffle face at an angle less than 45°. These portions, obviously, terminate at the low points 23 with the following portions of the wall and face thereafter converging together at an angle greater than 45° with respect to the plane of the wall and face.

The intervening portions of the walls and faces of the well and baffle, respectively, may be arranged with respect to each other at angles other than those above described, the speed of the traveling web of fabric through the wall between the wall and face being critical with regard to how the serrations in the wall and face are formed. The viscosity and rate of penetration of the treating liquid with respect to the web of fabric also should enter into the choice of angularity of the wall and face portions.

In the form of the invention shown in Figure 2, the walls of the well and the face of the baffle diverge gradually and converge suddenly. It is also to be noted that the wall and face may diverge suddenly and converge gradually, or may be smoothly rounded, as desired. The speed of the fabric will cause the turbulence if the walls of the well and baffle are such that room is provided for turbulence in the liquid.

In Figure 3 a similar arrangement of a plurality of wells is formed within the tank 25, the wells formed by the walls 26 and 27, for instance, being vertically extending within the tank 25 and having baffles 28 suspended from the upper end of the tank. Suitable feed rollers 29, 30, 30' and 31 convey the fabric in the direction of the arrow, to other feeding and carrying rollers 32 and thence for other operation of treatment or manufacture.

The serrations in the wall of the well and in the face of the baffle create greater turbulence and better penetration of the dye conveyed in the treating liquid and also may be used for bleaching or scouring, as desired.

The necks or constructions in the passage through the well are dimensioned with reference to the normal rate of penetration of the liquid and the speed of the fabric.

What is claimed is:

In an apparatus for the liquid treatment of a continuous web of fabric, including a tank, and at least one vertically disposed well positioned transversely of and within said tank, a horizontally disposed rotatable feed roller positioned in the lower end of said well, a horizontally disposed rotatable feed roller positioned on each side of said well adjacent the upper end thereof, and a baffle extending through said well and having its lower end adjacent said first mentioned roller and having its upper end adjacent the upper end of the well, the improvement consisting in providing serrations on the adjacent wall of said well and face of said baffle, said serrations forming together a tortuous passage for treating liquid, the high points of the serrations on the wall of said well being in registry with the high points on the face of said baffle, the low points on said wall and on said baffle also being in registry, said registering high points being followed in the direction of the liquid flow through the well by the intermediate wall and face portions diverging outwardly at an angle less than 45° with respect to the normal plane of said wall and said face, said portions terminating at the following complementary low points, the latter being followed by portions converging inwardly at an angle greater than 45° and terminating at the successive complementary high points.

### References Cited in the file of this patent

#### UNITED STATES PATENTS

|           |          |               |
|-----------|----------|---------------|
| 1,474,041 | Kaufle   | Nov. 13, 1923 |
| 2,552,078 | Williams | May 8, 1951   |
| 2,693,995 | Hannay   | Nov. 9, 1954  |