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METHOD OF TREATING MERCERIZING SOLUTION

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This invention relates to an apparatus for and process of treating the solution used in mercerizing cotton yarn or cloth.

At the present time cotton yarn or cloth is mercerized by immersing it in a strong solution of caustic soda, the yarn or cloth being under tension during the treatment. This material in passing through the treating solution of caustic soda gradually contaminates it with lint, gums, oils and dust particles.

The yarn or cloth also heats the caustic soda solution, which must be maintained at a low temperature. The foreign substances left in the solution are harmful to the mercerizing process and goods of the highest quality cannot be produced unless the bath of caustic soda solution is withdrawn from the mercerizing machine before the contamination becomes too great. However, this changing of the solution reduces production and causes loss of caustic soda.

The principal object of my invention is to overcome the disadvantages above stated by continuously drawing part of the caustic soda solution from the mercerizing machine, purifying it by filtration, cooling the solution to the required temperature, and then returning it to the mercerizing machine for re-use.

Another object is the provision of a simple reliable and efficient apparatus for carrying out my improved process.

In the accompanying drawings:

Figure 1 is a front view of the apparatus embodying my invention. Figure 2 is a vertical section of the cooling unit of the apparatus. Figure 3 is a similar section of the filtering unit. Figure 4 is an enlarged fragmentary cross section on line 4-4, Figure 3.

Similar characters of reference indicate corresponding parts throughout the several views.

In the preferred construction of the apparatus shown in the drawings, it comprises a mercerizing box or tank 10 mounted on the floor 11 of the mercerizing room and containing the caustic soda solution in which the yarn or cloth is immersed; a filter 12 for clarifying the solution located below the floor; and a cooling device 13 located above the floor and disposed between the inlet and outlet ends of the mercerizing box and the filter, respectively.

Connecting the bottom of the mercerizing box with the top of the filter tank 14 is a pipe 15 for the passage of the solution, the flow from the box to the filter being manually controlled by the valve 16 or automatically controlled by a float-actuated valve 17 of any suitable and well known construction, that shown in the drawings consisting of a float 18 guided in the cover 19 of the filter tank and connected to the stem of the valve plug 20 by a vertically swinging-arm 21. In the filter tank is a bed of sand 22 or other appropriate filtering medium which intercepts the lint, dust and other foreign particles present in the caustic soda solution.

After being filtered the solution is delivered to the cooling device 13 through a pipe 23 in which is interposed a suitable pump 24. This cooling device preferably consists of a tank 25 to the bottom of which is connected a pipe 26 for the discharge of the treated solution by gravity into the mercerizing box, while the pipe 23 discharges into the upper end of said tank. The latter contains a coil 27 for the circulation of a cooling fluid such as water or the brine from a refrigerating machine, and extending centrally through this coil is a suitable agitator 28 driven by an electric motor 29 for maintaining a rapid and constant circulation of the caustic solution around the cooling coil. Valves 30 and 31 in the pipes 23 and 26, respectively serve to control the flow of the caustic solution from the filter to the cooler and from the latter into the mercerizing box 10.

Connecting the pipe 15 with the pipe 23 by T-fittings 32 and 33, respectively, is a branch pipe 34 to which is joined a wash water inlet pipe 35 by which the filter may be cleaned from time to time in the customary manner. Valves 36 are disposed in the pipe 34 on either side of the inlet pipe 35 to control the flow of water to the top or bottom of the filter. An overflow box 37 is mounted in the upper portion of the filter-tank 14 to prevent the sand being washed away during the cleaning operation and at one end thereof it is provided with a back wash overflow pipe 38.
In operation, the contaminated caustic solution is withdrawn continuously from the mercerizing box 10 and circulated uninterruptedly through the filter and the cooler where it is thoroughly purified and cooled to the proper temperature before returning to the mercerizing box. This method and apparatus insures a clarified and properly cooled solution of caustic soda at all times and renders the efficient production of mercerized cotton yarn and cloth of the highest quality.

I claim as my invention:—

1. The method of treating a mercerizing solution of caustic soda, which consists in withdrawing part of the solution from its container, purifying it by filtration and then circulating it through a cooling medium.

2. The method of treating a mercerizing solution of caustic soda, which consists in continuously withdrawing part of the solution from its container, purifying it by passing it through a filtering medium, then circulating it through a cooling medium to the required temperature, and finally returning it to the container.

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