

FIG. 1

[RANJNA MEHTA-DUTT]
OF REMFRY & SAGAR
ATTORNEY FOR THE APPLICANT[S]

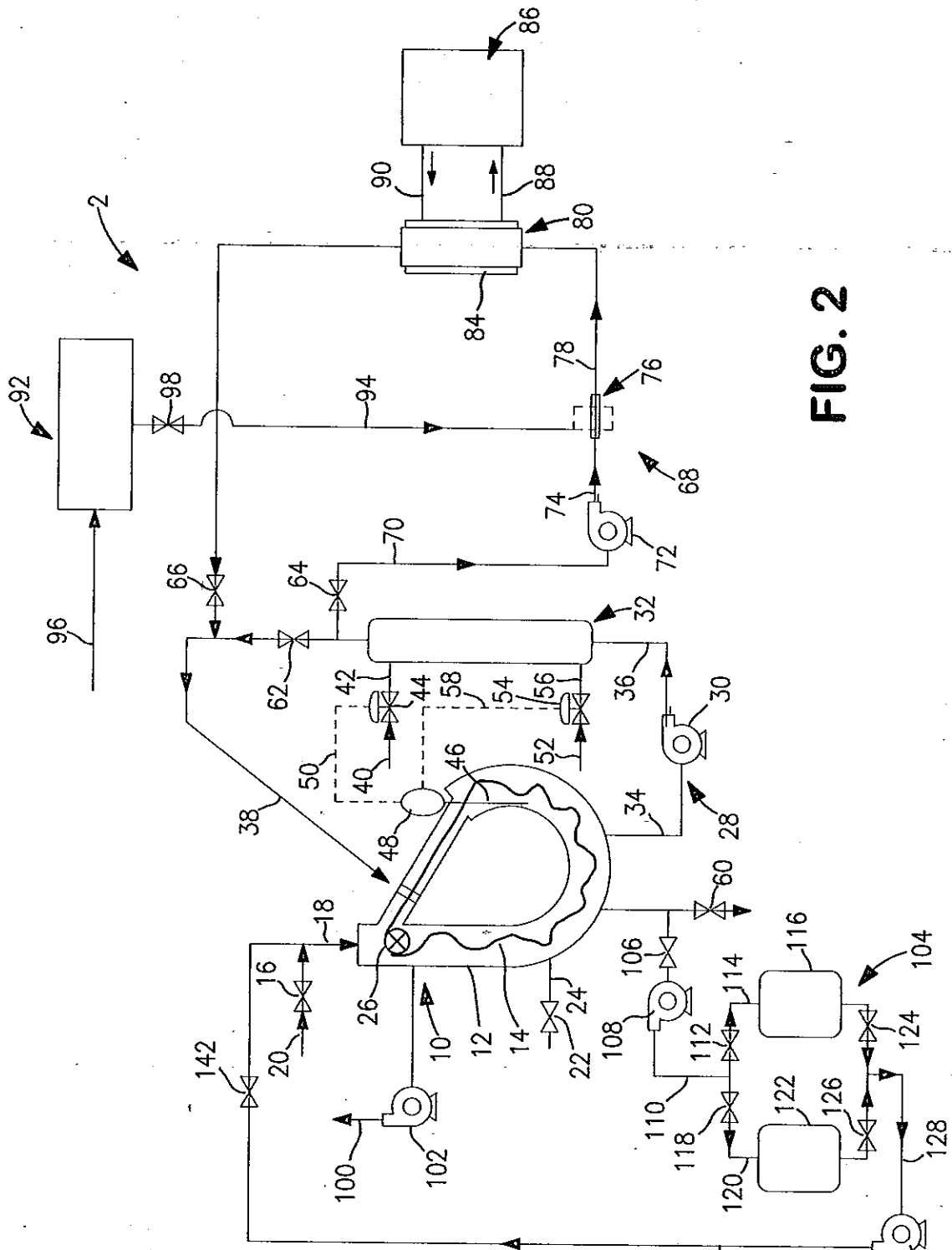


FIG. 2

[RANJANA MEHTA-DUTTA]
OF REMFRY & SAGAR
ATTORNEY FOR THE APPLICANT[S]

of 0.75 grams per liter and 0.5 grams per liter, respectively. The entire mass was heated to about 80.0° C. and treatment carried out for only 3 minutes. Sodium hydroxide, hydrogen peroxide and peroxide stabilizer were then added through inlet conduit 24 in lower amounts to achieve concentrations of 1.0 gram per liter, 1.0 gram per liter and 0.04 grams per liter, respectively. The temperature of entire mass of fabric and liquor in the treatment vessel 12 was raised to a temperature of between 95.0° C. and 100.0° C. by heating circulating peroxide containing liquor having a lower pH in the range of 11.0 to 12.0 in heat exchanger 32 by regulating flow of steam 40. The chemical treatment was continued for 30 to 40 minutes and the entire solution was cooled to 80.0° C. and drained.

[0039] Following the chemical treatment, the treatment vessel was filled again with fresh water having a temperature of between 25.0° C. and 30° C, followed by addition of sufficient amount of acetic acid to achieve acetic acid concentration of 0.4 grams per liter and sufficient amount of peroxide killer to achieve a concentration of 0.1 grams per liter. The neutralization step was carried out for about 9 minutes, and liquor drained. Intermediate whiteness index of the fabric was measured which was in the range of between 45.0 and 55.0 units on the CIE Whiteness scale, and the fabric was mote-free. The treatment vessel was then filled with fresh water and ozone bleaching of partially bleached fabric was carried out for 30 minutes using an aqueous solution containing between 6.0 and 12.0 milligrams per liter of dissolved ozone at a temperature of between 25.0° C. and 30.0° C. and having a pH of about 7.0. The ozone bleaching step resulted in a mote-free fabric having a final whiteness index in the range of between 60.0 and 65.0 on the CIE Whiteness Scale.

[0040] A pilot scale setup of apparatus 2, shown in Fig. 2, was used to conduct an exemplary bleaching operation in accordance with the present invention in which the ozone bleaching preceded the chemical bleaching.. The treatment vessel 12 was first filled with 150 liters of water for treating 15 kg of fabric. Sufficient amount of wetting agent introduced through inlet conduit 24 to achieve a concentration of 0.7